

# CHATTANOOGA- HAMILTON COUNTY AIR POLLUTION CONTROL NETWORK REVIEW 2023

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## Introduction

Hamilton County, Tennessee, contains the City of Chattanooga and the municipalities of Soddy Daisy; Signal Mountain; Red Bank; East Ridge; Collegedale; Ridgeside; Walden; Lakesite; and Lookout Mountain, Tennessee. It is on the Tennessee, Georgia, Alabama border which means that pollution reduction is a cooperative effort between states. Designation areas for both ozone and particulate contain counties from Tennessee and Georgia.

## Geography

Hamilton County is a picturesque Tennessee River valley between White Oak Mountain on the East of the county and Mowbray, Signal, Elder, Raccoon, and Lookout Mountains on the West of the County. The county is divided vertically by Big Ridge and Missionary Ridge, part of the same ridge chain. The Tennessee River flows through the ridge horizontally (where the ridge name changes) and through downtown Chattanooga. The valley, therefore, is shaped similarly to an “A”. The topography is a liability for pollution prevention and reduction as frequent temperature inversions trap smoke in the valley.

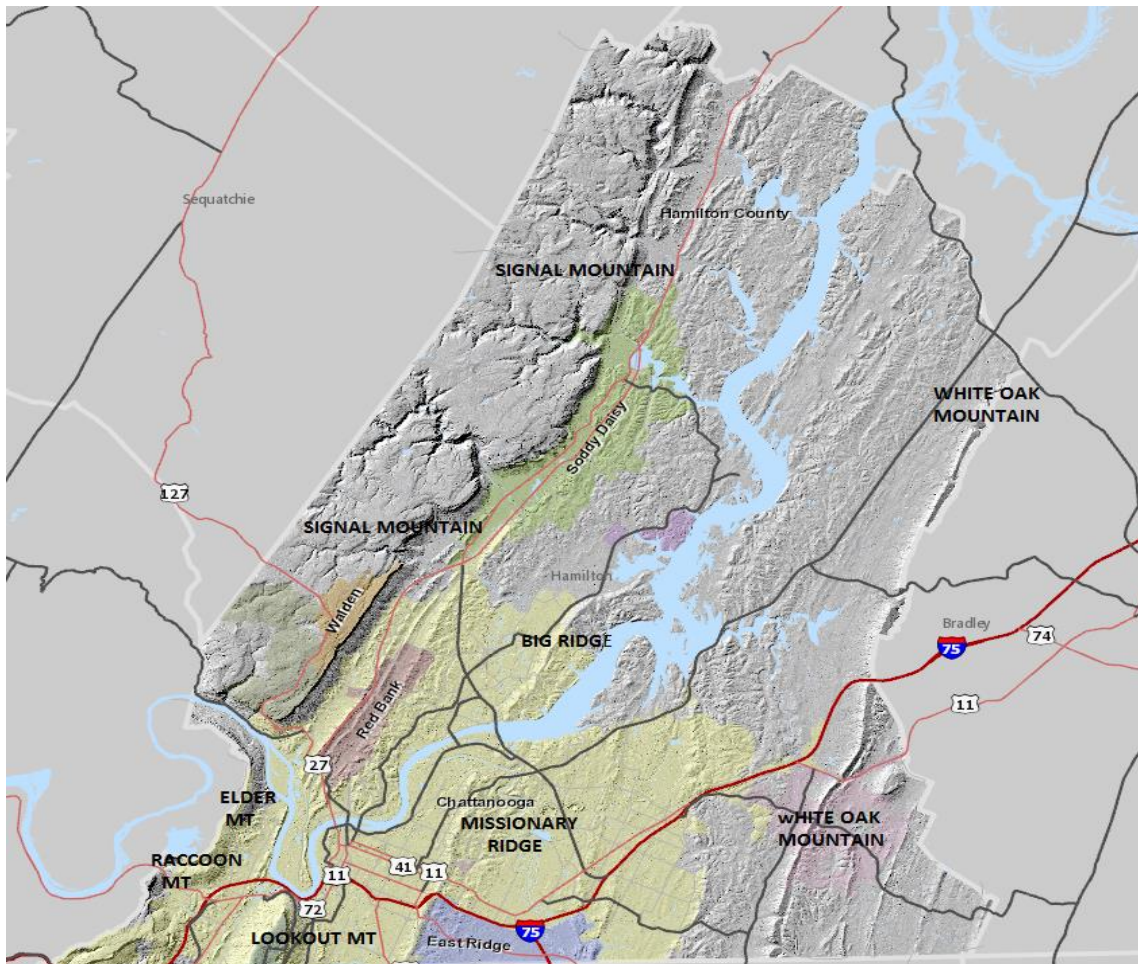


Figure 1: Map of Hamilton County, Tennessee

Downtown Chattanooga is about 680 feet above sea level. There were at least four floods of downtown Chattanooga in the late 1800s and early 1900s, the most devastating one in 1867. To attempt to remedy the flooding, downtown was filled from 3 to 15 feet after 1917 or an average of about one story. The fill area started with four central downtown streets and eventually covered about 40 blocks. Begun in 1933, the Tennessee Valley Authority's system of dams and control of the waterways not only provided electricity to the masses, but it improved Chattanooga's flooding plight considerably.

## Traffic Patterns

About 1988 the then largest mall in Tennessee, Hamilton Place, was built in East Brainerd accessible by I-75. This spurred commercial and residential growth around the mall. In one year vehicle miles traveled (VMT) per year increased from about 6 million VMT to over 10 million VMT.

The Interstate 75 corridor, a major north-south route for commercial transport, runs through Chattanooga and connects with I-24 near East Ridge. On either side of the I-75-24 split are the highest traffic counts in Hamilton County according to the Tennessee Department of Transportation Traffic Information Management and Evaluation System. The latest available posted numbers are from the year 2022 indicating a daily average traffic count of 122,874 at the #212 East Ridge Station which is just west of the I-75/24 split. At 214 West of East Ridge on I-24 is a count of 123,324. The highest count in Hamilton County on the east side of the split at #163 is 129,430 in 2022. The I-75/24 split was reworked by the state, beginning in 2020, to ease traffic congestion as the split is a traffic bottleneck. Phase I was completed in August 2021 with Phase II to start in 2023. The first phase completion did not alleviate all the congestion. The congestion is anticipated to be problematic until the project is completed.

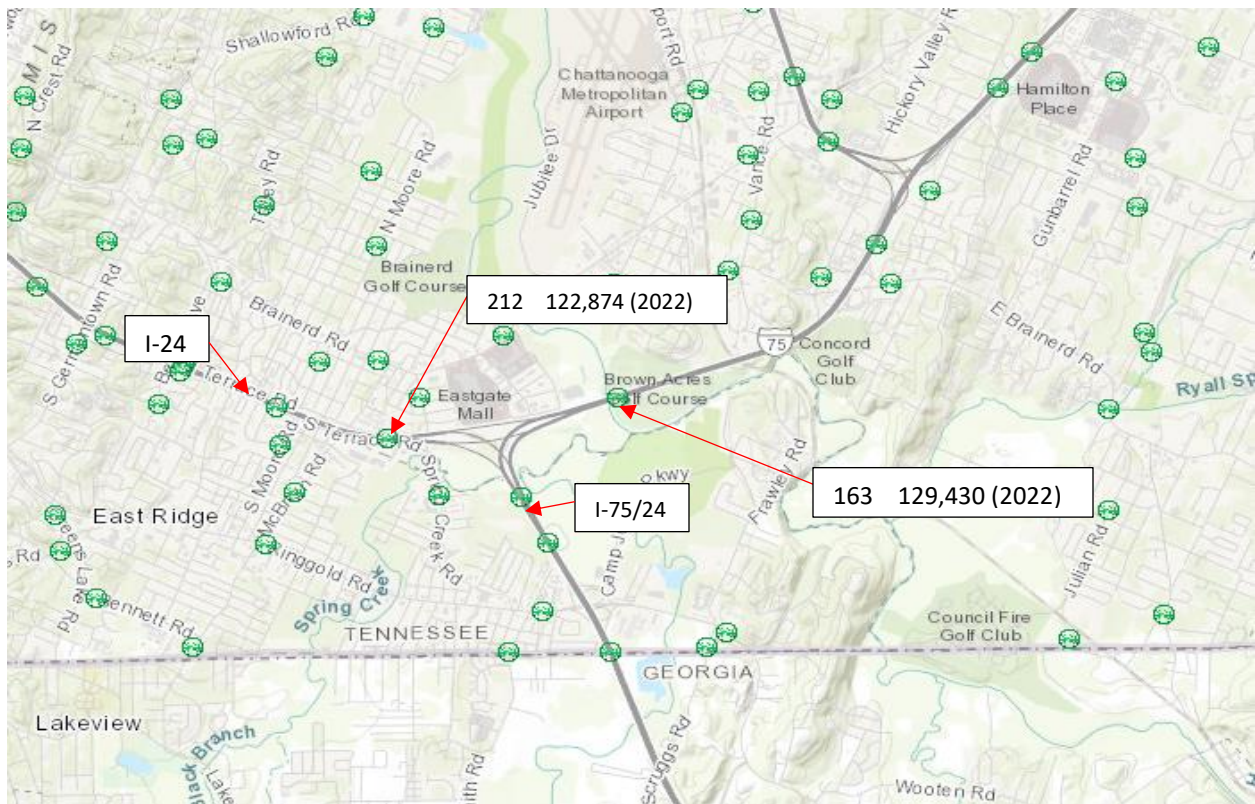


Figure 2: Map of High Traffic Area of Hamilton County, Tennessee

## Vehicle Miles Traveled

The latest available data posted on TDOT’s website for VMT by county is for the year 2021. The VMT decreased from 2019 to 2020 by 1,421,087. There had been a steady increase since 2013 until the Covid pandemic. The pandemic caused many employees to work from home and closed schools in 2020 and 2021.

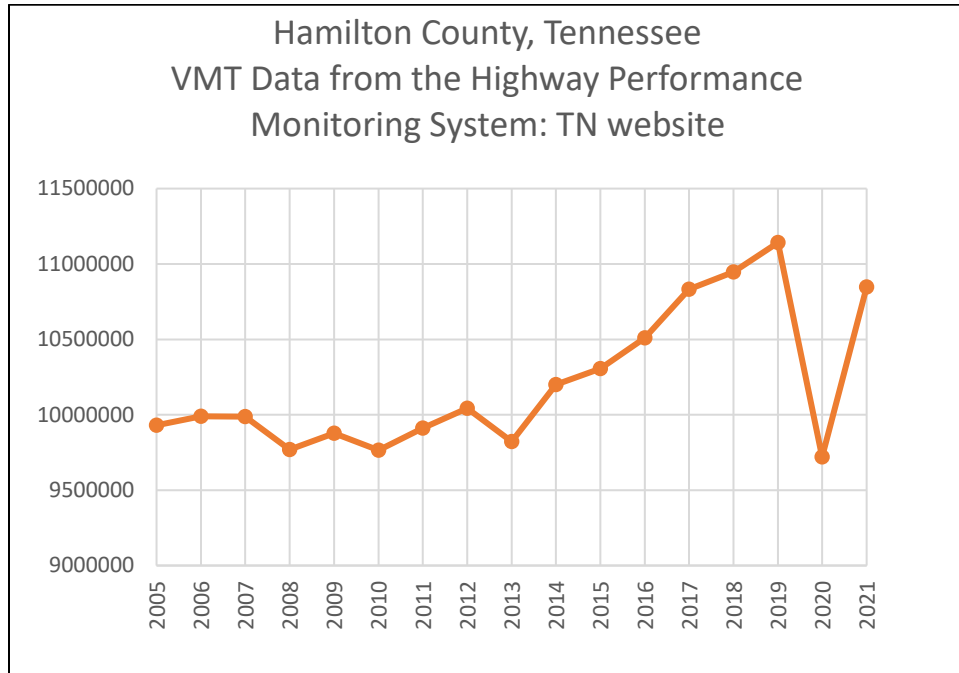


Figure 3: Data from Tennessee Highway Performance Monitoring System

## Population

The U.S. Census Bureau population estimate (from the website) for July 1, 2022 for Hamilton County is 374,682. The 2021 census population estimate for the City of Chattanooga is 182,113.

An area of high population density in Hamilton County is downtown in the University of Tennessee at Chattanooga area. This area contains a particulate monitoring site for PM<sub>2.5</sub>. The University density is seasonal as the density decreases in the summer months. The City of Chattanooga has a population density of 1,272 (2020) persons per square mile. The population density of Hamilton County is 675 (2020) persons per square mile.

The Hamilton County racial demographics for predominant ethnicities for 2021 (most current available from US Census Bureau) of Hamilton County (based on the Vintage 2021 Population Estimates Program) are White only (not Hispanic or Latino) 70.6%; Black only 19.0%; Asian only 2.2%; and Latino/Hispanic only 6.4%. The racial demographics of the City of Chattanooga (based on the 2021 American Community Survey- 5 year estimates) for predominant ethnicities are: White only (not Hispanic or Latino) 56.3%, Black only 30.6%, Asian only 2.7%, and Latino/Hispanic only 7.3%. The Census Bureau cautions against

comparisons of geographic area racial demographics because of the methodology differences in data sources.

The 2021 Small Area Income and Poverty Estimates (SAIPE) on the US Census Bureau website estimates the poverty in Hamilton County for 2021 as 12.6%. The poverty estimate for the City of Chattanooga is 17.6% based on the 2021 American Community Survey 5-year estimates. Neither estimation of poverty is comparable to other geographic level poverty estimates because of the methodology differences in data sources.

The temporary or permanent loss of employment during the Covid-19 pandemic in 2020 and 2021 affected the most vulnerable populations. The Chattanooga Regional Homeless Coalition estimated that the total homeless population (sheltered and unsheltered) increased 129% from 2020 to 2021 (Chattanooga Regional Homeless Coalition website: <https://www.homelesscoalition.org/metrics/>). The homeless point in time (PIT) count for HUD in January 2023 indicated that the count of sheltered and unsheltered was 785, a 31.4% decrease from 2022’s 1,144 count.

The Chattanooga-Hamilton County CBSA is composed of Hamilton, Marion, and Sequatchie counties in Tennessee and Catoosa, Dade, and Walker Counties in Georgia. The US Census Bureau’s July 1, 2021, population estimate for the CBSA is 567,641 with an estimated increase of 4,042 over the July 1 estimate for 2020 (US Census Bureau website). Hamilton is the most urbanized county in the CBSA. The other counties are more rural.

## Weather

Hamilton County tends to have frequent temperature inversions.

National Weather Service website  
 ('Normals' are thirty year averages based on the period 1981-2010)

Chattanooga Annual Averages	
Precipitation.....52.48 inches	Days with 0.01" or more of precipitation.....119.6
Snowfall.....3.9 inches	Days with 1.0" or more of snowfall.....1
Days with thunderstorms.....54.8	Days at or above 90 F.....47.7
Days with dense fog.....27.3	Days at or below 32 F.....58.3
Average first freeze.....November 4	Average last freeze.....April 1
Average first frost.....October 20	Average last frost.....April 14

Figure 4: Thirty Year Averages

Wind speed and direction are of interest in evaluating pollution, emissions, and transport. These wind roses were produced from data collected at the Chattanooga Metropolitan Airport at Lovell Field (Station 13882). Figure 5 is from Iowa State University’s posted Wind Roses for Lovell Field ([https://mesonet.agron.iastate.edu/sites/windrose.phtml?station=CHA&network=TN\\_ASOS](https://mesonet.agron.iastate.edu/sites/windrose.phtml?station=CHA&network=TN_ASOS)) and Figure 6 was created for 2022 by using the Midwestern Regional Climate Center’s Application Tools Environment (<https://mrcc.purdue.edu/CLIMATE/Hourly/WindRose.jsp>). The Iowa State long-term wind rose from January 1, 1970, to January 31, 2023, shows the primary wind direction to be North to South with calm winds 25.4% of the time, and the 2022 wind rose indicates the primary wind direction to be South to North.

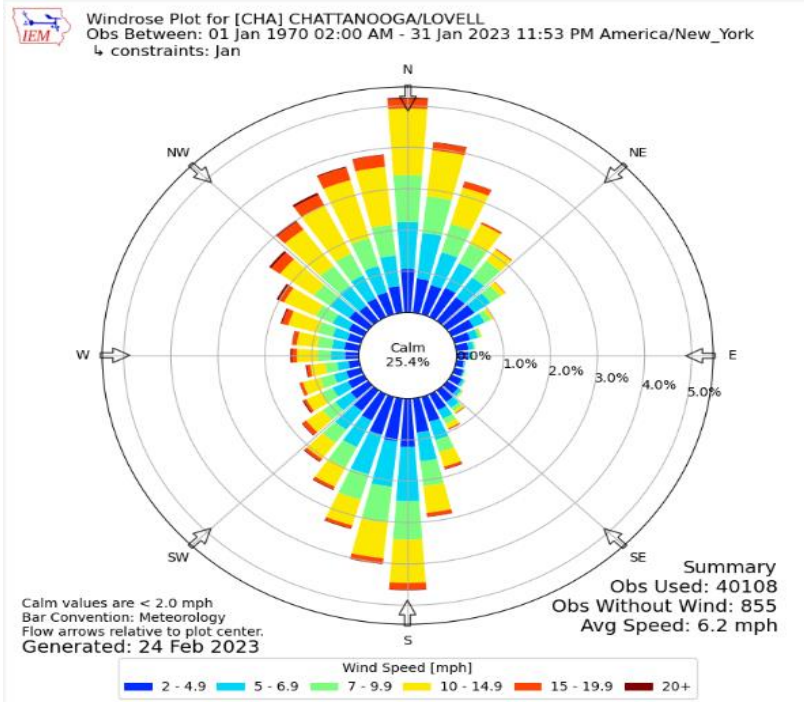
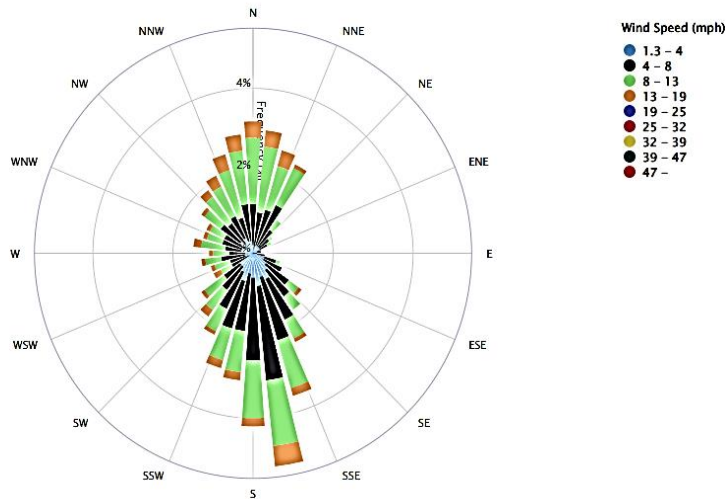


Figure 5- Wind Rose for Jan 1, 1970- Jan 31, 2023

CHATTANOOGA LOVELL AP (TN) Wind Rose

Jan. 1, 2022 - Dec. 31, 2022  
 Sub-Interval: Jan. 1 - Dec. 31, 0 - 23



Click and drag to zoom

CHATTANOOGA LOVELL AP (TN) - Wind Frequency Table (percentage)

Latitude : 35.0311	Start Date : Jan. 1, 2022	Sub Interval Windows
Longitude : -85.2014	End Date : Dec. 31, 2022	Start End
Elevation : 671 ft.	# of Days : 365 of 365	Date Jan. 1 Dec. 31
Element : Mean Wind Speed	# obs : poss : 8434 of 8760	Hour 0 23

Figure 6: Wind Rose for Jan 1, 2022- Dec 31, 2022

## Network Review 2023

### Discontinuation of the East Ridge Site

The Bureau petitioned EPA in a February 28, 2022, addendum to the 2021 Network Plan to delete the East Ridge PM<sub>2.5</sub> site at 1517 Tombras Avenue behind East Ridge City Hall. The City of East Ridge built a dog park around the site and requested that it be moved. The site was not the designation site, and there are two other sites in the attainment area meeting regulatory requirements.

The public notice was posted in the Chattanooga Times Free Press on March 1, 2022. The addendum was made available for public inspection and comment on the Bureau's website at <https://apcb.org/public-notice-announcements> from March 1 through April 19, 2022. No written comments were received from the public. A public hearing was held in the Board Room at the Air Pollution Control Bureau's office located at 6125 Preservation Drive at 9:30 AM on April 19, 2022. The hearing had no attendance from the public. The posted hearing notice in the newspaper and on the website offered remote participation by request. There were no requests for remote participation. EPA approved the site discontinuation in a letter dated April 20, 2022, and the site was deleted in May 2022. The last run day was a void on May 8.

### PM<sub>10</sub> Site Requirement Waiver

The Chattanooga-Hamilton County Air Pollution Control Bureau petitioned EPA on August 28, 2014, to delete the collocated PM<sub>10</sub> site operating on a 6-day monitoring schedule at 3300 South Broad Street (470650006). High volume samplers were operated at the site. EPA approved the site deletion in the approval letter for the 2014 State Air Monitoring Plan dated January 13, 2015. The monitors were shut down after the January 12, 2015, run date. EPA considers the deletion of this site the granting of a waiver of 40 CFR PM<sub>10</sub> monitoring requirements. The waiver is to be requested and justified by data evaluation in the Five Year Network Review when it is submitted every five (5) years. The next submittal of the Five Year Network Review will be 2025.

### Data Comparison to the NAAQS- Request for Exclusion of T640 Data

40 CFR §58 requires the Annual Monitoring Network Review to identify sites that are suitable and sites that are not suitable for comparison against the annual PM<sub>2.5</sub> NAAQS. The Bureau submitted a formal request in a letter dated December 20, 2022, (provided in Appendix A) to have the T640 data disregarded in comparison to the NAAQS since the data does not match the filter-based 2025i data. Teledyne is working on an algorithm to make the data more closely align but the Bureau made this request until the data could be studied more closely or the algorithm becomes available. EPA approved this request since the comparison tool indicated that the data had a bias outside the acceptable range. EPA's formal response to this request will be in the response to the 2023 Tennessee Air Monitoring Plan. As part of this agreement the parameter in AQS was changed from 88101 to 88502 which means the data is acceptable for use with the Air Quality Index (AQI) and not acceptable for comparison against the NAAQS. All of the T640 raw and precision and accuracy data for which the Bureau is responsible has been converted to 88502.

All three Chattanooga-Hamilton County monitoring sites produce data that are suitable to compare against the National Ambient Air Quality Standards. No site is not meeting siting requirements, and all required data are produced by Federal Equivalent or Federal Reference Methods.



Collocated filter-based measurements (POCS 1 and 2) did meet data completion requirements at the Siskin (470654002) site for 2021. Therefore, there is a full filter-based dataset for that site. Ozone data met data completion requirements (470651011 and 470654003).

The T640 continuous data at Siskin Drive (470654002) did not meet data completion requirements per quarter as there was an issue in February and March, 2022, with span dust blocking the sensor. The instrument was disassembled and cleaned multiple times before it began working correctly. There was no loaner available.

Ozone and PM<sub>2.5</sub> particulate data are well below the NAAQS.

### Purchase of T640 for PM<sub>2.5</sub> AQI

The Bureau purchased a Teledyne T640 light scattering instrument in 2016 for continuous PM<sub>2.5</sub> monitoring. It began operation in 2017 as a Special Purpose monitor and is now used for the AQI only. It monitors PM<sub>10</sub> data in addition to PM<sub>2.5</sub>, but the PM<sub>10</sub> data is not Federal Equivalent. EPA has granted the Bureau’s request to disregard the T640 data in comparison to the NAAQS. The Bureau purchased a replacement T640 instrument with ARP funds, and it was installed January 20, 2023 at the Siskin Drive site (470654002).

Active Sites	Pollutant	Monitor	AQS #
911 Siskin Drive	<i>PM<sub>2.5</sub> Collocated</i> ( Primary-3-day, Secondary 12-day): TEI R & P FRM filter-based ----- <i>PM<sub>2.5</sub> Continuous</i> (FEM) and <i>PM<sub>10</sub></i> (not FEM): T640	(2) TEI R & P 2025i Seq. Both VSCC models ----- Teledyne T640 Continuous	470654002 CORE PM <sub>2.5</sub>
618 Sequoyah Road Soddy-Daisy High School	Ozone Continuous Ozone Calibrator	TEI 49i TEI 49iPS	470651011
3018 Hickory Valley Road Eastside Utility District	Ozone Continuous Ozone Calibrator	TEI 49i TEI 49iPS	470654003

Figure 7: Active Sites in 2023

### Equipment Evaluation

Equipment	Location	Serial Number	Condition
PM <sub>10</sub> - Stored	0006	1847- decommissioned 1/2015	Good
PM <sub>10</sub> - Stored	0006	1845-decommissioned 1/2015	Good
PM <sub>2.5</sub> Stored Spare		20781 with VSCC (operational spare)	Good
PM <sub>2.5</sub>	Storage	20775 with VSCC	Poor- Parts only
PM <sub>2.5</sub>	Storage	20772 with VSCC	Poor-Parts Only

Equipment	Location	Serial Number	Condition
PM <sub>2.5</sub>	Spare	20774-decommissioned 12/31/2015	Good
PM <sub>2.5</sub>	0031	2025- 90709 – decommissioned 5/6/2022	Good
PM <sub>2.5</sub>	4002 POC1	2025i-with VSCC SN 21084 installed 6/2018	Excellent
PM <sub>2.5</sub>	4002 POC2	2025i-with VSCC SN 21131 installed 6/2018	Excellent
PM <sub>2.5</sub> TEOM	Spare	1400A 24452: Eq Unit SES1B 203940211 Sensor Unit 140AB 244520302	Good
PM <sub>2.5</sub> T640	Spare	070600000:83 Installed 2017	Good
PM <sub>2.5</sub> T640	4002	SN 1596 installed 1/20/23	Excellent
Met One Speciation	4002	a5924/a5910-decommissioned 1/2015	Good
URG 3000	4002	3N-B0768- decommissioned 1/2015	Good
Ozone	1011	49i-143566748-installed 2/2015	Excellent
Ozone	4003	49i-143566747-installed 2/2015	Excellent
Ozone-Spare	1011	49C-58192-316	Good
Ozone-Spare	4003	49C-57404-313	Good
Ozone Calibrator-Spare	1011	49CPS-66337-352	Good
Ozone Calibrator-Spare	4003	49CPS-66338-352	Good
Ozone Calibrator	1011	49iPS- installed 2/2016	Excellent
Ozone Calibrator	4003	49iPS- installed 2/2016	Good
Data logger	1011	ESC 8816-1904	Good
Data logger	4003	ESC 8816-1905	Good
Data logger	Spare	ESC 8816-1906	Parts only
Data logger	4002	ESC 8832 AO994	Good
Data logger	1011	ESC 8832 A 4010 K	Good
Data logger	4003	ESC/Agilaire 8872 installed Aug 2017- 642	Excellent
Data logger	1011	ESC/Agilaire 8872: new April 2018: Installed in 2018, removed, and reinstalled for March 1, 2019- 799	Excellent
Ozone Audit Monitor	1011/4003	49i-0607415796	Good
Chart Recorder	1011	1001685- decommissioned 2/2017	Good
Chart Recorder	4003	1001686- decommissioned 2/2017	Good
Chart Recorder	Spare	Leeds/Northrup Speedomax 165 82-31986-1-1	Good
8 X 14 Shelter	1011	Shelter One 8148 SN21051—Surplussed	Good
8 X 14 Shelter	4003	EKTO 8814 SN 3473-1- Surplussed	Poor
PC with AV Trends	1011	Agilaire software/companion to Airvision	Excellent
PC with AV Trends	4003	Agilaire software/companion to Airvision	Excellent
UPS	1011	8872 needed UPS -installed 2018	Excellent
UPS	4003	8872 needed UPS-installed 2018	Excellent
Siskin Site deck	4002	Installed June 2018	Excellent
8 X 14 Shelter	1011	Shelter One –SN 20206-01 (installed 1/25/21) Model LS814	Excellent
8 X 14 Shelter	4003	Shelter One –SN 20235-01 (installed 1/25/21) Model LS814	Excellent

Figure 8: Equipment Evaluation 2022

## **Changes to Established Sites**

In February and March of 2022 the Bureau's two ozone sites (470654003 and 470651011) and the continuous PM<sub>2.5</sub> (470654002) were transitioned to fiber optics "always on" connections with a third party dedicated server data storage managed by Agilaire. The Bureau is now polling continuous sites utilizing the internet. Thermo IPort can be used to access the 2025i filter-based PM<sub>2.5</sub> instruments by way of the internet.

New Shelter One shelters for the Eastside and Soddy Daisy High School sites were installed January 25, 2021.

Eastside Utility is now using 8301 Hickory Valley Road as the plant address so Bureau documents will reflect this change. There is a half-mile private road, Reservoir Road, to the plant from Hickory Valley Road. The property is gated at Hickory Valley Road and half-way to the main plant on Reservoir Road. Entry requires either a verbal request to be let in remotely. The person making the request is now on camera.

The Bureau began using Very Sharp Cut Cyclones (VSCCs) for all PM<sub>2.5</sub> FRMs on January 1, 2017. The Bureau is no longer using WINs Impactors.

## **Collocation Requirements**

There have been two required collocations at the Siskin Drive site: the T640 collocated with a filter-based FRM and an FRM collocated with a second filter-based FRM. Both collocations are required because the filter-based 2025i is designated as the POC 1 primary monitor (reference). POC 2 was being operated on a 12-day schedule but was changed to 6-day in Q1 of 2022 to prevent data loss.

## **No Other Expected Site Changes for 2023**

No other site changes are expected for 2023.

## **Memorandum of Agreement with the State of Georgia**

The Memorandum of Agreement with the State of Georgia was renewed in 2018. A copy is included in Appendix B.

SODDY DAISY HIGH SCHOOL



Rep Org Name	CHATTANOOGA HAMILTON COUNTY AIR POLLUTION CONTROL BUREAU	<p>The Soddy Daisy High School site is located in the municipality of Soddy-Daisy in North Hamilton County. The site was initially established as an ozone site August 1, 1978, at 9527 West Ridge Trail Road behind the Head Start Building using a chemi-luminescence method. June 1, 1979, the method was changed to UV. The ozone site was moved February 1, 2002, within a mile radius, to a new shelter on a hill behind Soddy Daisy High School. The PM<sub>2.5</sub> monitor was originally located on the roof of the Sheriff's Annex at 6233 Dayton Boulevard (AQS 470650032) as a Special Purpose Monitor (established 6/5/1999). The monitor was moved to the roof of the new shelter at 470651011 in mid-January 2002- first monitoring date was 1/26/02. In June 2008 the monitor was changed from a WINS Impactor to a Very Sharp Cut Cyclone model while retaining the same method code to designate it FRM. May 20, 2009, the shelter and monitors were moved approximately 100 feet east on the same property to accommodate the building of a girls' softball field. The Bureau shut down the PM<sub>2.5</sub> SPM at the end of December 2015. The last run date was 12/27/2015. The site is active for ozone monitoring. A new Shelter One 8 X 14 shelter was installed 1/25/2021, on the foundation for the previous shelter.</p>
PQAO	0170	
Address	SODDY DAISY HIGH SCHOOL 618 SEQUOYAH ACCESS ROAD	
AQS ID	470651011	
County Name	HAMILTON	
CBSA	CHATTANOOGA/ NORTH GEORGIA	
Lat	35.233562	
Lon	-85.181591	
Parameter Code	44201	
Parameter	OZONE	
Monitor Type	SLAMS	
POC	1	
Interval	1	
Year	2023	
Collection Freq.	HOURLY	
Method	047	
FRM/FEM	THERMO ENVIRON. 49i	
Analysis	UV PHOTOMETRIC	
Ref Mtd ID	EQOA-0880-047	
Monitor Type	047	
Monitor Object.	BACKGROUND	
Dominant Source	AREA	
Meas. Scale	NEIGHBORHOOD	
Land Use Type	COMMERCIAL	
Location Setting	RURAL	
Elevation	930 FT ABOVE SEA LEVEL	
Closest Meteorological Site	CHATTANOOGA METROPOLITAN AIRPORT 1001 AIRPORT RD	
Date Site Established	8/01/1978 MOVED TO SDHS 2/1/2002, PM <sub>2.5</sub> DELETED 12/31/15	

## Soddy Daisy High School, 618 Sequoyah Road 470651011

Street Name	Average Daily Traffic Counts: TDOT website	Distance
Sequoyah Road- in front of the school	11,231 2022 (Station #374)	.28 miles, 446 meters
Hyatte Road- behind the site	1,845 (Lovell Road- intersects with Hyatte Rd) 2022 (#306)	.02 mile, 39.74 meters

Direction	Predominant Land Use (Industry, Residential, Commercial or Agricultural)
North	School property- boys ball fields
South	Beyond Hyatte Road is residential, rural, agricultural
East	Soddy Daisy High School and Daisy Elementary, 620 Sequoyah Road
West	Girls softball field, beyond the field is Hyatte Road, beyond Hyatte Road is residential, rural, agricultural

Directions	Trees	Height (m)	Distance (m)
North	tree, tree	5.8 m, 12.2 m	26.4 m, 45.4 m
South	Tree Row	12.6 m	27.2 m
East	Tree Row	12.6 m	67.4 m
West	Field House	2 story	7.4 m

Directions	Topographic Features (hills, valleys, rivers)	General Terrain (flat, rolling, rough)
North	Site is on hill	hill
South	Residential, farms	
East	Student parking lot below site	
West	Two story field house/concessions, parking lot and girls ball field on hill above site	Site is between an upper parking lot and a lower parking lot

Intake Height	
Soddy Daisy ozone	5.2 m

Soddy Daisy High School 470651011  
North



Northeast



Soddy Daisy High School-470651011  
East



Southeast



Soddy Daisy High School- 470651011  
South



Southwest





Soddy Daisy High School 4706510111  
West



Northwest



EASTSIDE UTILITY



Rep Org Name	CHATTANOOGA HAMILTON COUNTY AIR POLLUTION CONTROL BUREAU	<p>This ozone site was originally established June 13, 1979, using a UV method on Volunteer Army Ammunition Plant (VAAP) property as site 470650028. According to notes in AQS, the ozone monitor was moved to the Laboratory Building on Patrol Road 100-200 feet away about 1979. About 1982 the ozone monitor was moved to a trailer across the street and northwest of the lab in a wooded area. It was moved to Eastside Water Utility on the top of a hill in February, 2004, because of a road widening project which utilized the property on which the monitoring module sat. The site was moved more than two (2) miles which required changing the AQS identifying number from 470650028 to a new number, 470654003. The site is inside the Eastside Water Utility high security area which requires an access code or verbal request for admittance. A new 8 X 14 Shelter One shelter was installed 1/25/2021 on the foundation for the old shelter.</p>
PQAO	0170	
Address	RESERVOIR RD (PRIVATE DRIVE TO UTILITY), ADDRESS: 8301 HICKORY VALLEY ROAD	
AQSID	470654003, FORMERLY 0028	
County name	HAMILTON COUNTY	
CBSA	CHATTANOOGA/ NORTH GA	
Lat	35.102862	
Lon	-85.162243	
Parameter Code	44201	
Parameter	OZONE	
Monitor Type	SLAMS	
POC	1	
Int	1	
Year	2023	
Collection Freq	HOURLY	
Method	047	
FRM/FEM	THERMO ENVIRON. 49i	
Analysis	UV PHOTOMETRIC	
Ref Mtd ID	EQOA-0880-047	
Monitor Objective	TYPICAL CONCENTRATIONS	
Dominant Source	AREA	
Meas. Scale	URBAN	
Land Use Type	INDUSTRIAL	
Location Setting	URBAN AND CENTER CITY	
Elevation	940 FT ABOVE SEA LEVEL	
Closest Met Site	CHATTANOOGA METROPOLITAN AIRPORT, 1001 AIRPORT ROAD	
Date Site Established	6/13/1979 Moved from 0028- 2/2004 for 3/1/2004 season	

## 8301 Hickory Valley Road, Eastside Utility 470654003

Street Name	Traffic Counts: Average Per Day TDOT webpage
Highway 58	31,800 2022 (Station #271)
8301 Hickory Valley Road	9,960 2022 (#613)
Bonny Oaks	17,367 2022 (#71)
Reservoir Road – private drive to Eastside Water Utility	3 or 4 vehicles a day and a few trucks as the county is dumping dirt on the hill
Interstate 75	99,301 2022 (#616)
Highway 153	86,059 2022 (#216) ; 88,358 2022 (#265)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agricultural)
North	Commercial along Highway 58, residential beyond Highway 58
South	Undeveloped forest and Commercial/Industrial area
East	Forest
West	Forest to Highway 58, Commercial on Highway 58, then residential beyond

Directions	Trees/Buildings	Height (m)	Distance (m)
North	None		
South	Building- One story	1 story: 3.7 m	12.6 m
East	None		
West	SW- Building Tree behind building	1½ story: top of gable: 5 m 14.4 m	20.7 m 27.0 m

Directions	Topographic Features (hills, valleys, rivers)	General Terrain (flat, rolling, rough)
North	Site is on top of a hill at about 900 feet. It is a wilderness area as the entire hill is a gated high-security area. A drive to the site is through a beautiful forest and past a lake. One encounters deer, wild turkeys, hawks, and buzzards. Site is on the north edge of the hill- almost hanging over Highway 58. To the north is looking down the hill.	7,000 acres were a TNT plant (closed in mid 70s) controlled by the military that once housed nitric acid and sulfuric acid plants. More than 1,000 acres are developed to the southeast of this monitoring site as a commercial/ industrial area around and including the Volkswagen Plant. The Highway 58 area at the bottom of the hill to the North is Commercial. Highway 58 is a major highway running east/west.
South	One story building- Commercial	Flat on top of hill
East	Looking downhill	
West	Looking downhill	

<b>Intake Height</b>	
Eastside ozone	4.2 m

Eastside Utility -470654003  
North



Northeast



Eastside Utility -470654003  
East



Southeast



Eastside Utility -470654003

South, Southwest, and West cardinal/ordinal directional pictures have been removed for security reasons. They have been provided to EPA Region 4.

Northwest



SISKIN DRIVE/ UT Chattanooga



Rep Name	CHATTANOOGA-HAMILTON COUNTY AIR POLLUTION CONTROL BUREAU		
PQAO	0170		
Address	911 SISKIN DRIVE		
AQSID	470654002		
County	HAMILTON		
CBSA	CHATTANOOGA/ NORTH GEORGIA		
Lat	35.050918		
Lon	-85.293019		
Parameter	88101	88101	88502
Parameter	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>2.5</sub> CONTIN.
Monitor	SLAMS	SLAMS	Data Disregarded
POC	1	2	3
Interval	7	7	1
Year	2023	2023	2023
Collection Freq.	3-DAY	12-day beginning 5/9/20 / 6-day beginning 2022.	MINUTE HOURLY
Method	145 VSCC	145 VSCC	236
FRM/FEM	R & P 2025i SEQ	R & P 2025i SEQ	T640 REG MODEL
Analysis	GRAVIMETRIC LAB: IML	GRAVIMETRIC LAB: IML	LIGHT SCATTERING
Ref Mtd ID	RFPS-0202-145	RFPS-0202-145	EQPM 0516-236 2.5 only
Objective	POPULATION		
Source	AREA		
Meas.Scale	URBAN		
Land Use	COMMERCIAL		
Location	URBAN/ CENTER CITY		
Elevation	720 FT ABOVE SEA LEVEL		
Closest Met	CHATTANOOGA METROPOLITAN AIRPORT, 1001 AIRPORT RD		
Date Est.	1/01/1999	1/01/1999	2/15/2017

The Siskin Drive site was initially established January 1, 1999, as a CORE PM<sub>2.5</sub> site with collocated FRM monitors on the roof of the Davenport Building, 529 Oak Street, on the University of Tennessee at Chattanooga campus. The monitors were moved to the Student Center roof, 650 East 5<sup>TH</sup> Street, about early 2000; moved to a temporary site behind the University Administration Building at 400 Palmetto Street in late 2003 where the TEOM was first installed; then to a new shelter at the current site March 15, 2004, at 911 Siskin Drive. Met One Speciation was added 12/1/2001; a continuous PM<sub>2.5</sub> monitor was added 3/26/2004; and a URG3000 was added 10/1/2009. The continuous PM<sub>2.5</sub> monitor (TEOM) was operated at 30°C and had an SES predryer. The predryer failed in 2013 and was removed. The temperature was then raised to 50°C. A different early model TEOM was used. EPA defunded the Met One speciation and the URG3000 monitors in January 2015, and speciation monitoring ceased. FRMs were converted from WINS to internal VSCC models January 1, 2017. A T640 continuous was added in January, 2017, as an SPM. It began reporting PM<sub>2.5</sub> to AQS February 15, 2017. The shelter was replaced with a deck in June of 2018. At that time the TEOM was taken out of service and the T640 began reporting to AirNow. The 2025 VSCC FRMs were replaced with 2025i internal VSCC models on the new deck. Beginning 1/01/ 2019, the T640 status was changed from SPM to SLAMS. 12/20/2022 the Bureau requested to disregard the T640 data for comparison against the standard due to the data not meeting EPA bias requirements. All data for T640 was changed from 88101 to 88502 (AQI only). Filter-based POC 2 data can substitute for missing POC 1. The T640 retains POC 3. The POC 2 FRM changed from 3-day to 12-day monitoring on 5/9/19 then to 6 day monitoring on 6/22/2022. Siskin Rehabilitation Hospital had been using the property on which the site sits as an employee parking lot. Siskin built a parking garage so the site is no longer used for parking as of April 2020.

**911 Siskin Drive 470654002**  
**(Former site on University of Tennessee at Chattanooga campus)**

Street Names	Average Daily Traffic Counts: TDOT website
Siskin Drive	No counts: side road behind school
Third Street	14,570 2022 (Station #107)
Riverside Drive/Amnicola Highway	24,076 2022 (#108)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agricultural)
North	Commercial –Power Utility Fenced Enclosure for large transformers
South	School baseball field- Erlanger Hospital and Health Department in background
East	Siskin Rehabilitation Facility
West	Commercial-Power Utility Fenced Enclosure. Beyond Siskin Drive to the south are parking lots and buildings for school, Chattanooga School for Arts and Sciences, K-12. The school, parking lots, and athletic fields occupy the entire block bordered by Siskin Drive, Third Street, and Siskin Rehabilitation Facility

Directions	Trees/Buildings	Height (m)	Distance (m)
North	NE-Tree line	11.6 m	40.4 m
	E- Tree at end of tree line	6.0 m	30.8 m
	NW-Tree in Utility Enclosure	11.0 m Severely damaged	33.2m
South			
East			
West			

Directions	Topographic Features (hills, valleys, rivers)	General Terrain (flat, rolling, rough)
North	Site is on a small rise NE	Hill rises to north
South	School facilities	Hill
East	Two story building- Rehabilitation Facility	Hill
West	Transformer Enclosure	Hill

Intake Heights	
Siskin 1 FRM	2.6 m
Siskin 2 FRM	2.6 m
T640	2.8 m

Note: Siskin Rehabilitation Facility has planted in April 2022 a group of trees to the southeast of the site for ornamental purposes. They are below the hill that houses the monitoring site.



Siskin Drive-470654002  
North



Northeast



Siskin Drive-470654002  
East



Southeast



Siskin Drive-470654002

South



Southwest



West and Northwest are omitted for security reasons. They have been provided to EPA Region 4.

Appendix A Petition to Disregard T640 Data in Comparison  
Against the NAAQS



## Chattanooga-Hamilton County Air Pollution Control Bureau

December 20, 2022

Ms. Caroline Y. Freeman, Director  
Air and Radiation Division  
USEPA-Region IV  
Atlanta Federal Center  
61 Forsyth Street  
Atlanta, Georgia 30303

Dear Ms. Freeman:

Enclosed is the Chattanooga Hamilton County Air Pollution Control Bureau's request for exclusion of T640 PM<sub>2.5</sub> continuous FEM data from comparison to the NAAQS. This request will be included in the Chattanooga-Hamilton County portion of the 2023 State of Tennessee Annual Monitoring Network Plan. If the request is granted by EPA, the T640 data will still be used for the Air Quality Index (AQI).

If you have any questions contact Kathy Jones of my staff at 423-643-5980.

Sincerely,

Ron Drumeller  
Executive Director

C: Todd Rinck, EPA  
Katy Lusky, EPA  
Sara Waterson, EPA  
Bradley King, State of Tennessee  
Michelle Oakes, State of Tennessee  
DeAnna Oser, State of Georgia

# Chattanooga-Hamilton County Exclusion Request

## **Introduction:**

The Chattanooga-Hamilton County Air Pollution Control Bureau's (the Bureau) monitoring program has historically operated a PM<sub>2.5</sub> continuous monitor to support forecasting and reporting of the Air Quality Index (AQI). This monitor supplies data every hour to update the AQI on AIRNow ([www.airnow.gov](http://www.airnow.gov)). The Bureau has been using a continuous monitor since the early part of the last decade as the PM<sub>2.5</sub> monitoring program was implemented. Over the last few years, a number of PM<sub>2.5</sub> continuous monitors have been approved as Federal Equivalent Methods (FEMs). By utilizing an approved FEM, any subsequent data produced from the method may be eligible for comparison to EPA's health-based standard known as the National Ambient Air Quality Standards (NAAQS). The primary advantage of operating a PM<sub>2.5</sub> continuous FEM is that it can support both the AQI and supply data that are eligible for comparison to the NAAQS. Thus, a network utilizing PM<sub>2.5</sub> continuous FEMs can minimize the number of filter-based FRMs operated in the network, which are primarily used for comparison to the NAAQS. These filter-based FRMs are resource intensive in that they require field operations as well as pre- and post-sampling laboratory analysis which results in data not being available for approximately 2-4 weeks after sample collection.

The Bureau's first continuous monitor, purchased in 2004, was a Thermo TEOM that was not an FEM model. In February 2017 the Bureau's monitoring program began utilizing a Teledyne T640 regular model (FEM for PM<sub>2.5</sub> but not for PM<sub>10</sub>) collocated with two filter-based FRMs at the Siskin Site (470654002). The filter-based POC 1 is the primary monitor. The collocations enabled the Bureau to evaluate the T640 performance. Although the PM<sub>2.5</sub> continuous FEMs are automated methods, these methods still require careful attention in their set-up, operation, and validation of data. The Bureau was one of the first in the US to purchase a T640 and contributed to the SOP written for EPA. In 2017 the T640 was run as a special purpose monitor (SPM) and it was made a SLAMS January 1, 2019. The filter-based Thermo R & P FRM 2025i data have been compared against the T640 data since that time.

## **Request for Exclusion of PM<sub>2.5</sub> Continuous FEM data from Comparison to the NAAQS:**

In accordance with the PM NAAQS rule published on January 15<sup>th</sup>, 2013 (78 FR 3086) and specific to the provisions detailed in §58.10 (b)(13) and §58.11 (e) Chattanooga-Hamilton County is requesting that data from the continuous T640 at Siskin Drive (470654002) be considered for exclusion from comparison against the NAAQS. While the Bureau is working to optimize the monitoring instrumentation used to meet all of the monitoring objectives, it is uncomfortable to use the continuous T640 FEM data for comparison to the NAAQS because the data are higher in magnitude on average than the FRM data. After assessing the comparability of the PM<sub>2.5</sub> FEMs to the collocated FRMs for the Bureau's network, the Siskin site does not meet the comparability requirements for 2020, 2021, and 2022. A detailed one-page assessment using EPA's comparability tool is included at the end of this section. The information in the table that follows was taken from the comparability assessment.

**Table – Request for Exclusion of PM<sub>2.5</sub> Continuous FEM Data**

Site Name	City	Site ID	Cont. POC	Method	Begin Date	End Date	Cont/FRM Pairs per Season	Slope	Inter-cept	Meets Bias Requirement	Correlation
<b>Site with PM<sub>2.5</sub> continuous FEM that is collocated with FRMs:</b>											
Siskin Drive	Chattanooga	470654002	3	T640 Regular model	1/1/20	9/30/22	Winter: 70 Spring: 92 Summer: 76 Fall: 59	1.16	.44	No	.97

**Period of Exclusion of Data from the PM<sub>2.5</sub> Continuous FEMs:**

The above table details the period the Bureau is using to base the recommendation to exclude T640 PM<sub>2.5</sub> continuous FEM data. Per EPA Regional Office approval, these data will be loaded to EPA’s AQS database (or alter the existing parameter code for previously entered T640 data) in a manner where the data are only used for the AQI. Additionally, the Bureau will continue to load any new data generated for the next 18 months (intended to represent the period until December 31 of 2024) in the same manner or until approval from the EPA Regional Office is requested and received to change the monitoring objectives that the data from the T640 PM<sub>2.5</sub> continuous FEMs can support.

**PM<sub>2.5</sub> Continuous FEM data for Reporting the AQI:**

While the Bureau is requesting the monitor above not be used for comparison to the NAAQS, the data are of sufficient comparability to collocated FRMs that they can be used in AQI reporting. Therefore, with EPA Regional Office approval, the AQI data will be reported to the Bureau’s web site and to AIRNow ([www.airnow.gov](http://www.airnow.gov)). Additionally, the data will be stored in EPA’s AQS database that is used for “acceptable AQI” reporting (i.e., parameter code 88502) so that data users will know that these data are appropriate for use in AQI calculations.

If EPA approves for exclusion of this data, the parameter code will be changed from 88101 to 88502 for all T640 data currently stored in AQS. The T640 was initially operated as a Special Purpose Monitor. The data was entered from the beginning of the operation of the T640 as 88101.

**Continued Operation of PM<sub>2.5</sub> Monitors to Support NAAQS and AQI Reporting**

While the Bureau is requesting that T640 data from the Siskin Drive continuous site be set aside for comparison to the NAAQS, the Bureau will continue to operate PM<sub>2.5</sub> filter-based FRMs (Thermo R & P models 2025 “i” series) to support the objective of comparison to the NAAQS. As previously stated, the T640 PM<sub>2.5</sub> continuous monitor data will still be used for AQI reporting.

The Siskin Drive site (470654002) meets the collocation requirements for the Quality Assurance Requirements for Monitors used in Evaluations of NAAQS described in Appendix A and objectives of the Network Design Criteria for Ambient Air Quality Monitoring described in Appendix D of 40 CFR Part 58. The Siskin Drive site has filter-based collocated FRMs POCs 1 and 2, and the continuous T640 is POC 3. Thus, the collocation requirements for the site are being met.

With a US Census Bureau 2021 population estimate of 567,641 the CBSA is required to have one PM<sub>2.5</sub> site if the latest 3-year design value is less than 85% of the NAAQS (Table D-5 of Appendix D). There are, however, two regulatory sites since the State of Georgia Rossville/Williams Street site (132950004) also monitors for PM<sub>2.5</sub> in the CBSA.

**Assessments:**

The following is a one-page assessment of monitors at the Siskin Drive (470654002) site where there are collocated filter-based PM<sub>2.5</sub> FRMs and a continuous FEM monitor.

**Determining if the Criteria Has Been Met:**

The Continuous Monitor Comparability Assessment shows the combination of the multiplicative (slope) and additive (intercept) is outside the required test specification. This is determined by inspecting the figure on the middle left side of the one-page assessment that follows. **The "A" clearly indicates "All Data" outside the box for 2020, 2021, and 2022. This indicates that the comparability requirement is not met.**

**The slope regression relationship is outside the test specification of  $1 \pm 0.10$  at 1.16.**

The intercept is outside the test specification of between  $15.05 - (17.32 \times \text{slope})$  but not less than  $-2.0$  and  $15.05 - (13.20 \times \text{slope})$ , but not more than  $+2.0$ .

$15.05 - (17.32 \times 1.16) = -5.04$   $-5.04$  is more negative than  $-2$  so  $-2$  is the most negative the intercept can be

$15.05 - (13.20 \times 1.16) = -.26$  is within the maximum of  $+2$  so  $-.26$  is the most positive the intercept can be (still negative).

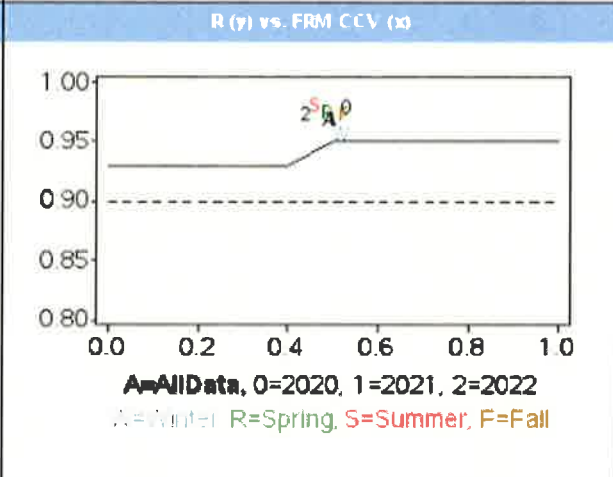
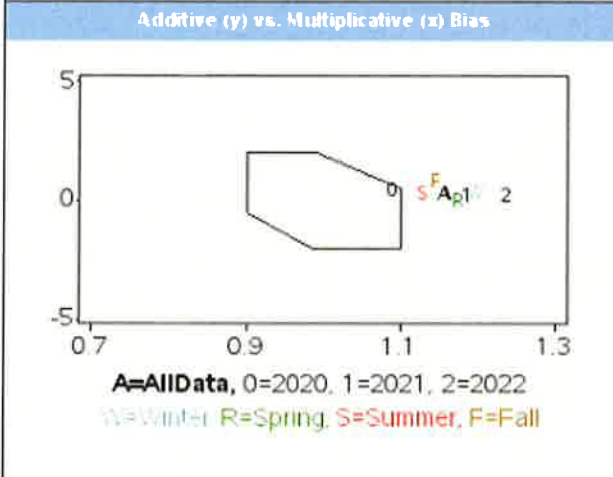
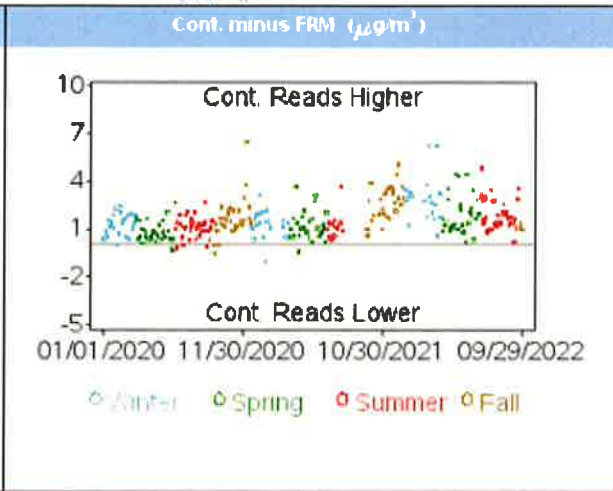
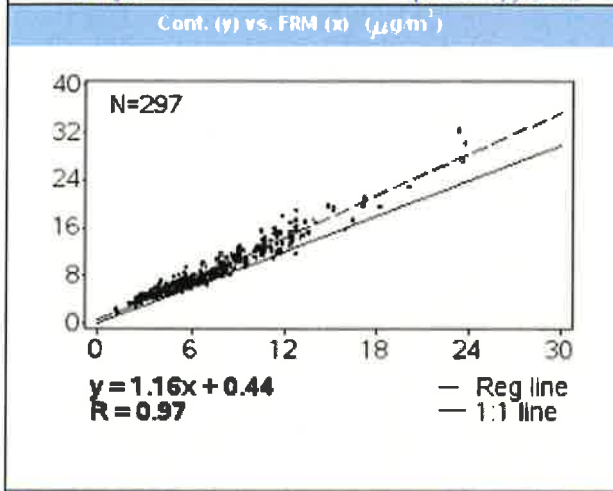
**The intercept of .44 is outside the bounds of  $-2$  to  $-.26$  that is allowed for a slope of 1.16 and this confirms that the overall comparability requirements have not been met.**



# PM<sub>2.5</sub> Continuous Monitor Comparability Assessment

## Site 47-065-4002: Chattanooga, TN

FRM R & P Model 2025 PM<sub>2.5</sub> Sequential Air Sampler w/VSCC - Gravimetric (118,145), PM<sub>2.5</sub> - Local Conditions (88101), POC=1,2  
 Cont. Teledyne T640 at 5.0 LPM - Broadband spectroscopy (236), PM<sub>2.5</sub> - Local Conditions (88101), POC=3



Mean Concentration ( $\mu\text{g}/\text{m}^3$ )

Dataset	N	FRM	Cont.	Ratio (Cont/FRM)
AllData	297	7.6	9.2	1.22
Winter	70	7.1	9.0	1.27
Spring	92	7.1	8.4	1.19
Summer	76	8.2	9.7	1.18
Fall	59	8.1	10.2	1.26
2020	121	7.3	8.5	1.17
2021	92	8.0	9.8	1.23
2022	84	7.5	9.7	1.28

Appendix A Statistics

Dataset	N	Bias	N	Bias
	(All observations)		(only $\geq 1 \mu\text{g}/\text{m}^3$ )	
AllData	297	24.6	282	22.8
Winter	70	31.8	62	26.9
Spring	92	20.5	86	18.6
Summer	76	19.1	76	19.1
Fall	59	29.6	58	29.5
2020	121	19.8	116	18.3
2021	92	25.1	89	24.0
2022	84	31.1	77	28.1

Appendix B EPA Approval Letter for  
Discontinuation of East Ridge Site



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

May 4, 2022

Mr. Ron Drumeller  
Executive Director  
Chattanooga-Hamilton County Air Pollution Bureau  
6125 Preservation Drive  
Chattanooga, Tennessee 37416

Dear Mr. Drumeller:

On April 20, 2022, the Chattanooga-Hamilton County Air Pollution Bureau (CHCAPB) submitted to the U.S. Environmental Protection Agency a Network Plan Addendum (Addendum) to the County's 2021 Annual Ambient Air Monitoring Network Plan (Network Plan).

The air monitoring regulations in 40 CFR §58.10(a)(1) require that a Network Plan Addendum be made available for public inspection and comment for at least 30 days before submission to the EPA for approval. CHCAPB made the Addendum available for public comment in the Chattanooga Times Free Press and on the CHCAPB website from March 1 - April 19, 2022, and no comments were received.

In the Network Plan Addendum, the CHCAPB proposes to discontinue the East Ridge City Hall PM<sub>2.5</sub> monitoring site (AQS ID: 47-065-0031). The EPA evaluated the requirements in 40 CFR 58.14 (c) for the shutdown request. The East Ridge City Hall site showed attainment during the previous five years and the probability is less than 10 percent that the monitor will exceed 80 percent of the applicable national ambient air quality standards during the next three years based on the concentrations, trends, and variability observed in the past. Additionally, the monitor is not specifically required by an attainment plan or maintenance plan, and the two remaining PM<sub>2.5</sub> state and local air monitoring stations in the Chattanooga core based statistical area (CBSA) exceed the minimum monitoring requirement of one PM<sub>2.5</sub> monitor in the CBSA. Therefore, removal of the East Ridge City Hall monitoring site will not affect the contingency measures and evaluation of attainment in the Chattanooga CBSA. The EPA approves the CHCAPB's request to discontinue the East Ridge City Hall monitoring site. Please reference this shutdown in the 2022 Annual Network Plan.

Thank you for working with us to monitor air pollution and promote clean air in Tennessee. If you have any questions or concerns, please contact Katy Lusky at (404) 562-9130 or Sara Waterson at (404) 562-9061.

Sincerely,

Caroline Y. Freeman  
Director  
Air and Radiation Division

cc: Mr. Bradley King  
Environmental Manager 3, Division of Air Pollution Control

## Appendix C MOA with State of Georgia

## **MEMORANDUM OF AGREEMENT**

### **ON AIR QUALITY MONITORING FOR CRITERIA POLLUTANTS FOR**

### **THE CHATTANOOGA-WALKER COUNTY**

### **METROPOLITAN STATISTICAL AREA MSA**

December 28, 2017

#### Participating Agencies:

##### Georgia

Georgia Department of Natural Resources (GA DNR)  
Environmental Protection Division GA EPD APB

##### Tennessee

Chattanooga-Hamilton County Air Pollution Control Bureau (CHCAPCB)

#### **I. PURPOSE/OBJECTIVES/GOALS**

The purpose of the Memorandum of Agreement (MOA) is to establish the Chattanooga-Hamilton County-Walker County Metropolitan Statistical Area (MSA) Criteria Pollutant Air Quality Monitoring Agreement between CHCAPCB and GAEPDAPB (collectively referred to as the "affected agencies") to collectively meet United States Environmental Protection Agency (EPA) minimum monitoring requirements for particles of an aerodynamic diameter of 10 micrometers and less (PM10), particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), and ozone; as well as other criteria pollutant air quality monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all parties. This MOA will establish the terms and conditions of this collective agreement to provide adequate criteria pollutant monitoring for the Chattanooga-Hamilton County-Walker Co, GA MSA as required by 40 CFR 58 Appendix D, Section 2, (e) (March 28, 2016)<sup>1</sup>.

#### **II. BACKGROUND**

The Chattanooga-Hamilton Co-Walker Co, GA MSA consists of the following counties: Dade, Walker, Catoosa, Hamilton, Marion, and Sequatchie. GA EPD APB has jurisdiction over Dade, Walker, and Catoosa Counties in Georgia and CHCAPCB has jurisdiction over Hamilton County, Tennessee. The State of Tennessee has jurisdiction over Marion and Sequatchie Counties in Tennessee, but does not have any permanent air monitoring sites in those counties. The CHCAPCB and GA EPD APB are required by the Clean Air Act to measure for certain criteria pollutants in the ambient air in the Chattanooga-Hamilton County-Walker Co, GA Metropolitan Statistical Area (MSA). The United States Environmental Protection Agency (EPA) has established minimum monitoring requirements based on the size of the MSA and the quality of the air in the

MSA for particles of an aerodynamic diameter of 10 micrometers and less (PM10), particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), and ozone.

40 CFR 58 Appendix D, Section 2, (e)<sup>1</sup> states (in part):

“...The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator.”<sup>1</sup>

Currently each air pollution control agency (affected agency) conducts monitoring in its respective jurisdiction and coordinates its monitoring with the other air pollution control agencies within the MSA.

## I. ROLES AND RESPONSIBILITIES

The parties agree to the following terms and conditions:

- CHCAPCB and GA EPD APB (the “affected agencies”) commit to conducting appropriate monitoring in their respective jurisdictions of the MSA; as needed, to collectively meet EPA minimum monitoring requirements for the entire MSA for PM10, PM2.5, and ozone, as well as other criteria air pollutant monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all affected agencies. The minimum air quality monitoring requirement (for PM10, PM2.5, and ozone described in 40 CFR 58) for the MSA shall apply to the MSA in its entirety and shall not apply to any sole affected agency within the MSA unless agreed upon by all affected agencies.
- The affected agencies commit to coordinating monitoring “...responsibilities and requirements...to achieve an effective network design...”<sup>1</sup> regarding criteria air pollutant monitoring conducted in the MSA and commit to communicate unexpected or unplanned changes in monitoring activities within their jurisdictions to the other affected agencies of this MOA. As conditions warrant, the affected agencies may conduct telephone conference calls, meetings, or other communications to discuss monitoring activities for the MSA. Each affected agency shall inform the other affected agencies via telephone or e-mail of any monitoring changes occurring in its jurisdiction of the MSA at its earliest convenience after learning of the need for the change or making the changes. Such unforeseen changes may include evictions from monitoring sites, destruction of monitoring sites due to natural disasters, or similar occurrences that result in a loss of more than 25% data in a quarter or a permanent change in the monitoring network. At least once a year in the second quarter of the year or before June 15<sup>th</sup>, each agency shall make available to the other agencies who are a party to this agreement, a copy of its proposed monitoring plan for the MSA for the next

year. The CHCAPCB will submit the network review that is submitted to the State of Tennessee for inclusion in the State's monitoring plan.

- Each party reserves the right to revoke or terminate this MOA at any time and for any reason by giving thirty (30) days written notice prior to the date of termination.

### **III. LIMITATIONS**

- A. All commitments made in this MOA are subject to the availability of appropriated funds and each party's budget priorities. Nothing in this MOA, in and of itself, obligates CHCAPCB or GA EPD APB to expend appropriations or to enter into any contract, assistance agreement, interagency agreement or other financial obligation.
  
- B. This MOA is neither a fiscal nor a funds obligation document. Any endeavor involving reimburse or contribution of funds between parties to this MOA will be handled in accordance with applicable laws, regulations, and procedures, and will be subject to separate subsidiary agreements that will be effected in writing by representatives of the parties.
  
- C. Except as provided in Section III, this MOA does not create any right or benefit, substantive or procedural, enforceable by law or equity against CHCAPCB or GA EPD APB, their officers or employees, or any other person. This MOA does not direct or apply to any person outside CHAPCD or GAEPD APB.

### **V. PROPRIETARY INFORMATION AND INTELLECTUAL PROPERTY**

No proprietary information or intellectual property is anticipated to arise out of this MOA.



## **VI. POINTS OF CONTACT**

The following individuals are designated points of contact for the MOA:

GA EPD APB      DeAnna G. Oser  
GAEPD APB Ambient Monitoring Program  
4244 International Parkway, Suite 120  
Atlanta, GA 30354

[DeAnna.Oser@dnr.ga.gov](mailto:DeAnna.Oser@dnr.ga.gov)

Voice: (404) 363-7004

FAX: (404) 363-7100

CHCAPCB          Robert Colby  
CHCAPCB  
6125 Preservation Dr  
Chattanooga, Tn 37416

[rcolby@chattanooga.gov](mailto:rcolby@chattanooga.gov)

Voice: (423) 643-5999

FAX: (423) 643-5972

## **VII. MODIFICATION/DURATION/TERMINATION**


This MOA will be effective when signed by all parties. This MOA may be amended at any time by the mutual written consent of the parties. The parties will review this MOA at least once every 10 years to determine whether it should be revised, renewed, or cancelled. This MOA may be revoked or terminated by an affected agency at any time and for any reason by giving thirty (30) days written notice prior to the date of termination.

## **VIII. REFERENCE**


1 – United States Environmental Protection Agency, Title 40 Code of Federal Regulations, Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 2 (e), “General Monitoring Requirements”.

**IX. APPROVALS**

**Georgia Department of Natural Resources, Environmental Protection Division  
Air Protection Branch (GA EPD APB)**

BY:   
TITLE: DIRECTOR  
DATE: 1/24/18

**Chattanooga-Hamilton County Air Pollution Bureau (CHCAPCB)**

BY:   
TITLE: Director  
DATE: January 3, 2018

# Nashville-Davidson County

## Air Monitoring Network Plan 2023

Prepared by Nicole Rondeau



*Metro* **Public Health** *Dept*  
Nashville / Davidson County  

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**Promoting and Protecting Health**

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## 1.0 NASHVILLE AIR MONITORING NETWORK

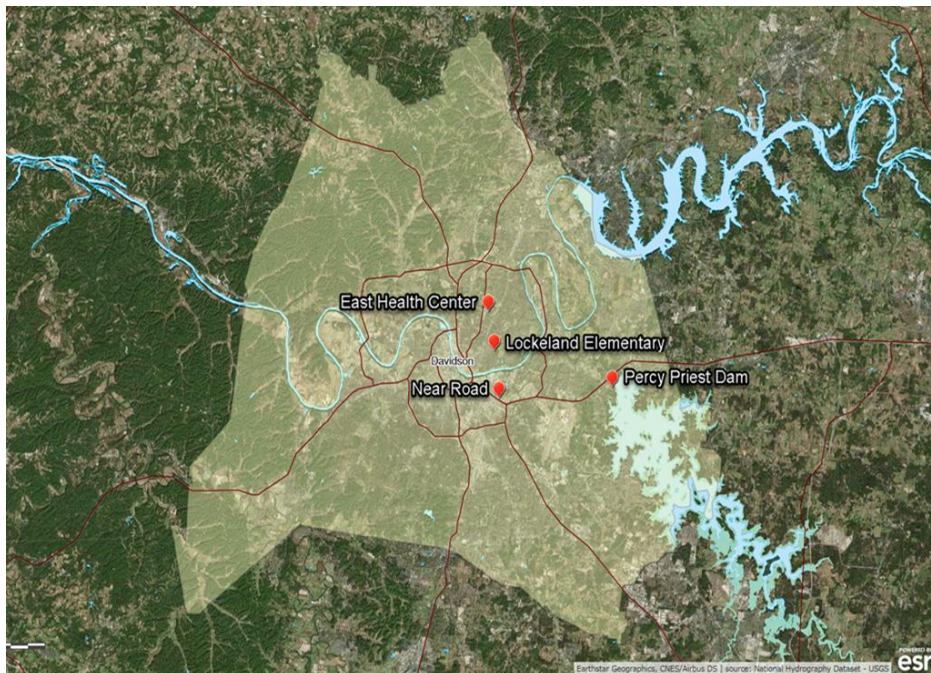
### 1.1 *NASHVILLE AIR MONITORING NETWORK REVIEW 2023*

Beginning January 1<sup>st</sup>, 2015, the Nashville-Davidson County Air Monitoring program (Nashville) became its own Primary Quality Assurance Organization (PQAO) where previously, it was one PQAO with the State of Tennessee's Department of Environment and Conservation (TDEC). Requirements for the Nashville-Davidson-Murfreesboro-Franklin Core-Based Statistical Area (CBSA) are met by the monitors run by both Nashville and TDEC's air monitoring networks.

The following document provides information on the current monitoring network, any proposed changes to the network, site descriptions, site evaluations, and an inventory of all instruments and their current condition. It is intended to fulfill the requirements of 40 CFR Part 58.10, where each monitoring organization must review their network on an annual basis to ensure that all requirements within appendices A, B, C, D, and E of Part 58 are being met.

### 1.2 *CURRENT AMBIENT AIR MONITORING NETWORK OF NASHVILLE-DAVIDSON COUNTY*

**Figure 1-1: Nashville-Davidson County Air Monitoring Network**



The 2023 Nashville-Davidson County monitoring network had no significant changes made from 2022. Nashville has 4 sites in operation for 2023: the East Health Center which monitors for NO<sub>2</sub> and O<sub>3</sub>; Lockeland Elementary School which monitors continuous PM<sub>10</sub>, and both regulatory and AQI specific PM<sub>2.5</sub>; the Percy Priest Dam site which monitors for O<sub>3</sub>; and the Near Road site which monitors for CO,

NO<sub>2</sub>, SO<sub>2</sub>, and PM<sub>2.5</sub>. See the map of Davidson County (*Figure 1-1*) for the locations of Nashville's 2023 monitoring network.

Currently, only one PM<sub>10</sub> monitor is operating for the Nashville-Davidson-Murfreesboro-Franklin CBSA. Although two PM<sub>10</sub> monitors are required by 40 CFR Part 58, Appendix D, Section 4.6 for the CBSA, the EPA approved a waiver for this requirement in the 2016 Network Plan response due to the historically low concentrations recorded in Davidson County. This waiver was reviewed again in the 2020 five-year network assessment. For all other pollutants, PM<sub>2.5</sub>, O<sub>3</sub>, SO<sub>2</sub>, NO<sub>2</sub>, and CO, the minimum monitoring requirements of the CFR are being met for the CBSA.

In December 2022, we received preliminary approval by the EPA for an exclusion from comparison to the NAAQS for the T640x PM<sub>2.5</sub> Continuous FEM monitor located at Lockeland Elementary. This preliminary approval is pending the resubmission of the exclusion request in the 2023 Annual Network Plan and its successful completion of the resulting approval process. This change is discussed in more detail below in Section 1.3.3 **PM<sub>2.5</sub> Monitoring**.

### 1.3 PROPOSED CHANGES TO AIR MONITORING NETWORK

No major changes are proposed to take place in 2023 for the Nashville-Davidson County Monitoring Network. Although, as previously stated, we have received preliminary approval by the EPA for an exclusion from comparison to the NAAQS for the T640x PM<sub>2.5</sub> Continuous FEM monitor located at Lockeland Elementary. See Section 1.3.3 **PM<sub>2.5</sub> Monitoring**, for more details.

Additionally, discussions have taken place with the EPA with regards to moving the ozone monitor currently located at Percy Priest Dam to a new location for future monitoring. This new site has not yet been confirmed but likely will be in the Southeast quadrant of Davidson County, located to ensure the capture of pollutants downwind of the secondary wind direction. Some things must be kept in mind during this location scouting such as ideally positioning the new site 5-10 miles downwind from NO<sub>x</sub> production areas (downtown highway loop). The new location should be relevant to current population dynamics and ensure that afternoon wind directions during O<sub>3</sub> season are considered.

#### 1.3.1 OZONE MONITORING

In July 2022, the Nashville Davidson County Air Monitoring Program was awarded some funding as part of the American Rescue Plan. We plan to use a portion of the funding to update the networks ozone analyzers in 2023. We hope to have them in place by the start of the Ozone season in 2024.

#### 1.3.2 PM<sub>10</sub> MONITORING

No changes are proposed for this portion of the Nashville Davidson County Air Monitoring Network.

### 1.3.3 *PM<sub>2.5</sub> MONITORING*

From the start of operation on September 1<sup>st</sup>, 2020, until August 30<sup>th</sup>, 2022, the T640x PM<sub>2.5</sub> continuous FEM monitor, located at Lockeland, was approved for a 2-year NAAQS exclusion, while an investigation into the monitor's comparability to the FRM occurred. During this investigative period, we were able to gather sufficient data for analysis, and determined the T640x PM<sub>2.5</sub> Continuous FEM monitor had poor comparability to the FRM; we subsequently applied for another NAAQs exclusion from the EPA. In December 2022, we received preliminary approval for the NAAQs exclusion, pending our exclusion request's resubmission in the 2023 Annual Network Plan and its successful completion of the resulting approval process.

Although we are requesting the T640x PM<sub>2.5</sub> monitor not be used for comparison to the NAAQS, we do believe that the data are of sufficient comparability to the collocated FRM, to be used in AQI reporting. Thus, since September 1<sup>st</sup>, 2022, as a result of the preliminary approval and on instruction from the EPA, the data from the T640x PM<sub>2.5</sub> Continuous FEM monitor have been used solely for AQI reporting purposes and submitted to AQS using the 88502 parameter code.

We have continued to operate the PM<sub>2.5</sub> FRM and other PM<sub>2.5</sub> continuous FEM monitors to support the objective of comparison to the NAAQS; each of these PM<sub>2.5</sub> monitors has been operated so to meet the objectives of the Network Design Criteria for Ambient Air Quality Monitoring described in Appendix D to Part 58.

The exclusion request and detailed assessment are included in Section 8.0 ***Appendix B – Nashville-Davidson County 2022 Application for Exclusion of Teledyne T640x PM<sub>2.5</sub> Continuous FEM Data from Comparison to NAAQS*** for more information regarding the T640x\_PM2.5 NAAQS Exclusion.

### 1.3.4 *NITROGEN DIOXIDE MONITORING*

No changes are proposed for this portion of the Nashville Davidson County Air Monitoring Network.

### 1.3.5 *CARBON MONOXIDE MONITORING*

No changes are proposed for this portion of the Nashville Davidson County Air Monitoring Network.

### 1.3.6 *SULFUR DIOXIDE MONITORING*

No changes are proposed for this portion of the Nashville Davidson County Air Monitoring Network.



## 2.0 SITE DESCRIPTIONS

### 2.1 EAST HEALTH CENTER – DAVIDSON COUNTY, TN

The East Health Center site monitors for ozone and nitrogen dioxide. This site has been in operation since 1972 and will continue to monitor for these two pollutants in 2023; SO<sub>2</sub> monitoring was moved from this site to the Near Road Site beginning January 1<sup>st</sup>, 2020.

**Table 2-1: East Health Center Site Information**

**Figure 2-1: East Health Center**



**Figure 2-2: East Health Center (Aerial View)**



Agency Name (Code)	Metro Public Health Department (0682)	
AQS ID	470370011	
County Name	Davidson	
Address	1015 Trinity Lane	
CBSA	34980	
Latitude, Longitude	36.205000, -86.744722	
Parameter Code	42602	44201
Parameter Name	NO <sub>2</sub>	O <sub>3</sub>
Monitor Type	SLAMS	SLAMS
POC	1	1
Collection Frequency	Hourly	Hourly
Method	74	47
Monitoring Instrument	Thermo 42i	Thermo 49i
Analysis	Chemiluminescence	Photometric
Ref. Method ID	RFNA-1289-074	EQOA-0880-047
Monitor Objective	Highest Concentration	Population Exposure
Dominant Source	Area	Area
Measurement Scale	Neighborhood	Neighborhood
Land Use Type	Residential	Residential
Location Setting	Urban	Urban
Date Established	1/6/1975	1/1/1972

## 2.2 PERCY PRIEST DAM – DAVIDSON COUNTY, TN

The Percy Priest Dam site is located on the Army Corps of Engineers Percy Priest Dam campus. Ozone is the only pollutant monitored at this site. Monitoring for ozone began on January 1<sup>st</sup>, 1978 and will continue to operate for the 2023 ozone season.

**Figure 2-3: Percy Priest Dam Site**



**Figure 2-4: Percy Priest Dam Site (Aerial View)**



**Table 2-2: Percy Priest Dam Site Information**

Agency Name (Code)	Metro Public Health Department (0682)
AQS ID	470370026
County Name	Davidson
Address	3711 Bell Road
CBSA	34980
Latitude, Longitude	36.150742, -86.623301
Parameter Code	44201
Parameter Name	O <sub>3</sub>
Monitor Type	SLAMS
POC	1
Collection Frequency	Hourly
Method	47
Monitoring Instrument	Thermo 49i
Analysis	Photometric
Ref. Method ID	EQOA-0880-047
Monitor Objective	Highest Concentration
Dominant Source	Area
Measurement Scale	Urban
Land Use Type	Agricultural
Location Setting	Urban
Date Established	28491

### 2.3 LOCKELAND ELEMENTARY SCHOOL – DAVIDSON COUNTY, TN

The Lockeland Elementary School monitoring site began operation in 1999 and will continue operation in 2023. This site was defunded as a CSN site and shut down the SASS and URG monitors at the end of 2014. As of January 1<sup>st</sup>, 2017, a PM<sub>10</sub> TEOM monitor began operating at this location as the Hi-Vol PM<sub>10</sub> monitors at Trevecca and McCann were approved to be shut down by the end of 2016 by EPA. Starting July 1<sup>st</sup>, 2019, an FEM (POC 3) MetOne BAM 1022 PM<sub>2.5</sub> monitor was added to this site to replace the Thermo 2025i FRM (POC 1) monitor. The decision to replace the FRM with an FEM was justified in the 2019 Annual Network Plan and approved by EPA.

Due to the Tornado that occurred on March 3<sup>rd</sup>, 2020, all equipment previously at this site was damaged beyond repair. This site was equipped with new air monitors and began capturing air quality data in August/September 2020.

As a result of the damages caused by the tornado, some changes were made to the monitors that were previously on site. The two Thermo TEOM 1405s that ran PM<sub>2.5</sub> (AQI) and PM<sub>10</sub> were replaced with a single piece of equipment, the Teledyne T640x which can measure both criteria pollutants at once.

From the start of operation on September 1<sup>st</sup>, 2020, until August 30<sup>th</sup>, 2022, the T640x PM<sub>2.5</sub> continuous FEM monitor was approved for a 2-year NAAQS exclusion, while an investigation into the monitor's comparability to the FRM and BAM1022 continuous FEM monitor occurred. During this investigative period, we were able to gather sufficient data for analysis, and determined the T640x PM<sub>2.5</sub> Continuous FEM monitor had poor comparability to the FRM; we subsequently applied for another NAAQS exclusion from the EPA for this monitor. In December 2022, we received preliminary approval for the NAAQS exclusion, pending our exclusion request's resubmission in the 2023 Annual Network Plan and its successful completion of the resulting approval process.

Please refer to Section 8.0 **Appendix B – Nashville-Davidson County 2022 Application for Exclusion of Teledyne T640x PM<sub>2.5</sub> Continuous FEM Data from Comparison to NAAQS** to see the application for the NAAQS exclusion, submitted to the EPA.

Figure 2-5: Lockeland Site



Figure 2-6: Lockeland Site (Aerial View)

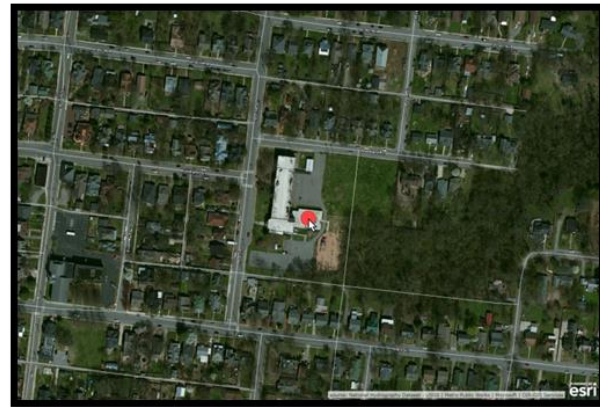


Table 2-2: Lockeland Site Information

Agency Name (Code)	Metro Public Health Department (0682)			
AQS ID	470370023			
County Name	Davidson			
Address	105 South 17th Street			
CBSA	34980			
Latitude, Longitude	36.176326, -86.738902			
Parameter Code	88101	88101	88502	81102
Parameter Name	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Monitor Type	SLAMS	SLAMS	AQI	SLAMS
POC	2	3	4	2
Collection Frequency	1:6	Hourly	Hourly	Hourly
Method	145	209	238	239
Monitoring Instrument	Thermo 2025i	MetOne BAM 1022	Teledyne T640x	Teledyne T640x
Analysis	Gravimetric	Beta Attenuation	Light Scattering	Light Scattering
Ref. Method ID	EQPM-0202-145	EQPM-1013-209	EQPM-0516-238 (AQI only)	EQPM-0516-239
Monitor Objective	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Dominant Source	Area	Area	Area	Area
Measurement Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Land Use Type	Residential	Residential	Residential	Residential
Location Setting	Urban	Urban	Urban	Urban
Date Established	1/1/1999	1/1/1999	3/1/2001	1/1/2017

## 2.4 NEAR ROAD SITE – DAVIDSON COUNTY, TN

The Near Road site is located along the I-24/I-40 split in downtown Nashville and was established as part of the near road NO<sub>2</sub> monitoring requirement. CO and NO<sub>2</sub> monitors have been in operation since the site began monitoring on July 1<sup>st</sup>, 2014. From January 1<sup>st</sup>, 2017 to July 1<sup>st</sup>, 2019, a PM<sub>2.5</sub> FRM monitor (Thermo 2025i) was also in operation. Starting on July 1<sup>st</sup>, 2019, the FRM monitor was removed and replaced by an FEM PM<sub>2.5</sub> monitor (MetOne BAM 1022). As of January 1<sup>st</sup>, 2020, SO<sub>2</sub> monitoring began at this site after being moved from the East Health Center Site.

**Figure 2-8: Near Road Site**



**Figure 2-7: Near Road Site (Aerial View)**



**Table 2-3: Near Road Site Information**

Agency Name	Metro Public Health Department (0682)			
AQS ID	470370040			
County Name	Davidson			
Address	1113 Elm Hill Pike			
CBSA	34980			
Latitude, Longitude	36.142377, -86.734142			
Parameter Code	42101	42602	42401	88101
Parameter Name	CO	NO <sub>2</sub>	SO <sub>2</sub>	PM <sub>2.5</sub>
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS
POC	1	1	1	3
Collection Frequency	Hourly	Hourly	Hourly	Hourly
Method	93	74	60	209
Monitoring Instrument	Teledyne T300	Thermo 42i-TL	Thermo 43iQ	MetOne BAM 1022
Analysis	Infrared	Chemiluminescence	Pulsed Fluorescence Fluorescent	Beta Attenuation
Ref. Method ID	RFCA-1093-093	RFCA-1289-574	EQSA-0486-060	EQPM-1013-209
Monitor Objective	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Dominant Source	Area	Area	Area	Area
Measurement Scale	Urban	Urban	Urban	Urban
Land Use Type	Industrial	Industrial	Residential	Industrial
Location Setting	Urban	Urban	Urban	Urban
Date Established	7/1/2014			

### 3.0 ANNUAL SITE ASSESSMENTS

Each year, siting evaluations are performed to assess the impact on obstructions such as trees and buildings on the inlets at our sampling sites. These should be measured while the leaf canopy is full to assess the potential issues fully. The site assessments below, which include a table of measurements from obstructions and directional photos, show that each monitoring location is meeting the requirements of 40 CFR Part 58, Appendix E and have each been carried out in the last calendar year. Appendix A of this document includes the Site Evaluation Form template used to conduct site evaluations.

**Table 3-1: 2023 Site Assessment Results**

Site Pollutant	Probe Inlet Height (IH)	Obstruction Height (OH)	Dripline	Type of Obstruction	Unrestricted Airflow	Findings
<b>East Health Center – Evaluated 4/18/23</b>						
O <sub>3</sub>	10.0m	16.3m	17.1m	Trees	300°	Site OK; trees to the north and east will be monitored.
NO <sub>2</sub>	10.0m	16.3m	17.1m	Trees	300°	
<b>Percy Priest Dam – Evaluated 4/18/23</b>						
O <sub>3</sub>	5.3m	19.0m	36.6m	Trees	310°	Site OK; trees to the north will be monitored.
<b>Lockeland Elementary – Evaluated 4/18/23</b>						
PM <sub>2.5</sub> <i>Primary</i>	5.8m	6.1m	30.0m	Building	280°	Site OK; All large trees lost at site during tornado 2020 and subsequent storms in 2021.
PM <sub>2.5</sub> <i>Collocated</i>	5.8m	6.1m	30.0m	Building	280°	
PM <sub>2.5</sub> <i>AQI</i>	5.8m	6.1m	30.0m	Building	280°	
PM <sub>10</sub>	5.8m	6.1m	30.0m	Building	280°	
<b>Near Road – Evaluated 4/18/23</b>						
SO <sub>2</sub>	4.5m	14.2m	19.8	Trees	300°	Site OK; vegetation on fence line and trees to the east will be monitored.
CO	4.5m	14.2m	19.8	Trees	300°	
NO <sub>2</sub>	4.5m	14.2m	19.8	Trees	300°	
PM <sub>2.5</sub>	4.5m	14.2m	19.8	Trees	300°	

3.1 EAST HEALTH CENTER 2023 SITE ASSESSMENT

Figure 3-3: East Health Center (NORTH)



Figure 3-2: East Health Center (SOUTH)



Figure 3-1: East Health Center (EAST)



Figure 3-4: East Health Center (WEST)



Figure 3-5: East Health Center Site Assessment Form

SITING EVALUATION FIELD FORM <span style="float: right;">Rev. 4/13/23</span>					
Metro Public Health Department Air Pollution Lab PCD-AM-020					
Site Name: <u>East Health Clinic</u>				Date: <u>4/18/23</u>	
AQS I.D.: <u>47-037-0011</u>				Time: <u>8:30 am</u>	
Coordinates: <u>36.204, -83.744</u>				Inspected by: <u>HM</u>	
Scale: <u>Neighborhood</u>				Signature: <u>[Handwritten Signature]</u>	
LIST EQUIPMENT USED					
PARTICULATE MONITORS					
	Units	PM2.5	PM2.5 Collocated	PM10	
Probe Inlet Height [ IH ]	m	/			
Distance to nearest road	m				
Obstruction Type	/				
Obstruction Height [ OH ]	m				
Obstruction Distance [ OD ]	m				
Collocated Distance	m				
Unrestricted Airflow	degrees				
Dripline	m				
GASEOUS MONITORS					
	Units	CO	OZONE	NOx	SO2
Probe Inlet Height [ IH ]	m	/			
Distance to nearest road	m				
Obstruction Type	/				
Obstruction Height [ OH ]	m				
Obstruction Distance [ OD ]	m				
Collocated Distance	m				
Unrestricted Airflow	degrees				
Dripline	m				
		YES/NO	PASS/FAIL		
Are all probes at least 1 meter apart?		Yes			
Are all probes located in an area that is paved or has vegetative ground cover?		Yes			
Are all rooftop samplers located at least 2 meters away from any structures?		Yes			
There MUST be 270 degrees of unrestricted airflow around the probe or sampler.		$2(16.3 - 10) =$	Pass		
Obstruction Distance MUST be $\geq 2*(OH - IH)$ .		$19.3 > 12.6$	Pass		
Dripline must be at least 10m away when tree is an obstruction.			Pass		



3.2 PERCY PRIEST DAM 2023 SITE ASSESSMENT

Figure 3-7: Percy Priest Dam (NORTH)



Figure 3-6: Percy Priest Dam (SOUTH)



Figure 3-9: Percy Priest Dam (EAST)



Figure 3-8: Percy Priest Dam (WEST)



Figure 3-10: Percy Priest Dam Site Assessment Form

SITING EVALUATION FIELD FORM					Rev. 4/12/23
Metro Public Health Department Air Pollution Lab PCD-AM-020					
Site Name:	Percy Priest Dam	Date:	4/19/23		
AQS I.D.:	47, 037, 0026	Time:	9:00		
Coordinates:	36.150, -86.623	Inspected by:	GTR		
Scale:	Urban	Signature:			
LIST EQUIPMENT USED					
PARTICULATE MONITORS					
	Units	PM2.5	PM2.5 Collocated	PM10	
Probe Inlet Height [ IH ]	m	/			
Distance to nearest road	m				
Obstruction Type	/				
Obstruction Height [ OH ]	m				
Obstruction Distance [ OD ]	m				
Collocated Distance	m				
Unrestricted Airflow	degrees				
Dripline	m				
GASEOUS MONITORS					
	Units	CO	OZONE	NOx	SO2
Probe Inlet Height [ IH ]	m	/			
Distance to nearest road	m				
Obstruction Type	/				
Obstruction Height [ OH ]	m				
Obstruction Distance [ OD ]	m				
Collocated Distance	m				
Unrestricted Airflow	degrees				
Dripline	m				
		CO	OZONE	NOx	SO2
			5.3		
			164		
			Tree		
			19		
			42		
			310		
			36.6		
				YES/NO	PASS/FAIL
Are all probes at least 1 meter apart?				Yes	
Are all probes located in an area that is paved or has vegetative ground cover?				Yes	
Are all rooftop samplers located at least 2 meters away from any structures?				Yes	
There MUST be 270 degrees of unrestricted airflow around the probe or sampler.					PASS
Obstruction Distance MUST be $\geq 2 \times (\text{OH} - \text{IH})$ .					PASS
Dripline must be at least 10m away when tree is an obstruction.					PASS

3.3 LOCKELAND ELEMENTARY 2023 SITE ASSESSMENT

Figure 3-12: Lockeland Elementary (NORTH)



Figure 3-11: Lockeland Elementary (SOUTH)



Figure 3-14: Lockeland Elementary (EAST)



Figure 3-13: Lockeland Elementary (WEST)



Figure 3-15: Lockeland Elementary Site Assessment Form

SITING EVALUATION FIELD FORM					Rev. 4/12/23
Metro Public Health Department Air Pollution Lab PCD-AM-020					
Site Name:	Lockeland			Date:	4/18/23
AQS I.D.:	47.0037.0073			Time:	10:00
Coordinates:	36.176, -86.738			Inspected by:	GT
Scale:	Neighborhood			Signature:	<i>[Signature]</i>
LIST EQUIPMENT USED					
PARTICULATE MONITORS					
	Units	PM2.5	PM2.5 Collocated	PM10	
Probe Inlet Height [ IH ]	m	5.8	5.8	5.8	
Distance to nearest road	m	6.6	6.6	6.6	
Obstruction Type	/	building	building	building	
Obstruction Height [ OH ]	m	6.1	6.1	6.1	
Obstruction Distance [ OD ]	m	19.0	20.4	18.4	
Collocated Distance	m	3.0	3.0		
Unrestricted Airflow	degrees	280	280	280	
Dripline	m	30m	30	30	
GASEOUS MONITORS					
	Units	CO	OZONE	NOx	SO2
Probe Inlet Height [ IH ]	m				
Distance to nearest road	m				
Obstruction Type	/				
Obstruction Height [ OH ]	m				
Obstruction Distance [ OD ]	m				
Collocated Distance	m				
Unrestricted Airflow	degrees				
Dripline	m				
				YES/NO	PASS/FAIL
Are all probes at least 1 meter apart?				Yes	
Are all probes located in an area that is paved or has vegetative ground cover?				Yes	
Are all rooftop samplers located at least 2 meters away from any structures?				Yes	
There MUST be 270 degrees of unrestricted airflow around the probe or sampler.					PASS
Obstruction Distance MUST be $\geq 2 \times (\text{OH} - \text{IH})$ .					PASS
Dripline must be at least 10m away when tree is an obstruction.					PASS

3.4 NEAR ROAD 2023 SITE ASSESSMENT

Figure 3-17: Near Road Site (NORTH)



Figure 3-16: Near Road Site (SOUTH)



Figure 3-19: Near Road Site (EAST)



Figure 3-18: Near Road Site (WEST)



Figure 3-20: Near Road Site Assessment Form

SITING EVALUATION FIELD FORM					Rev. 4/11/23
Metro Public Health Department Air Pollution Lab PCD AM 020					
Site Name:	Near Road Site			Date:	4/18/23
AQS ID:	47-037-0040			Time:	9:30 am
Coordinates:	36.142, -86.734			Inspected by:	HM
Scale:	Urban			Signature:	<i>Mark mguy</i>
LIST EQUIPMENT USED					
PARTICULATE MONITORS					
	Units	PM2.5	PM2.5 Collocated	PM10	
Probe Inlet Height [ IH ]	m	4.5	/	/	
Distance to nearest road	m	28.9			
Obstruction Type	/	Tree			
Obstruction Height [ OH ]	m	14.2			
Obstruction Distance [ OD ]	m	23			
Collocated Distance	m				
Unrestricted Airflow	degrees	300			
Dripline	m	19.8			
GASEOUS MONITORS					
	Units	CO	OZONE	NOx	SO2
Probe Inlet Height [ IH ]	m	4.5	/	4.5	4.5
Distance to nearest road	m	28.9		28.9	28.9
Obstruction Type	/	Tree		Tree	Tree
Obstruction Height [ OH ]	m	14.2		14.2	14.2
Obstruction Distance [ OD ]	m	23		23	23
Collocated Distance	m				
Unrestricted Airflow	degrees	300		300	300
Dripline	m	19.8		19.8	19.8
				YES/NO	PASS/FAIL
Are all probes at least 1 meter apart?				Yes	
Are all probes located in an area that is paved or has vegetative ground cover?				Yes	
Are all rooftop samplers located at least 2 meters away from any structures?				Yes	
There MUST be 270 degrees of unrestricted airflow around the probe or sampler				$2(14.2 - 4.5) =$	Pass
Obstruction Distance MUST be $> 2*(OH - IH)$				$23 > 19.4$	Pass
Dripline must be at least 10m away when tree is an obstruction					Pass
<p>The diagram illustrates the siting requirements for a monitor. It shows a sampler inlet at a height of IH, a probe at a height of IH, and an obstruction (tree) at a height of OH and a distance of OD from the probe. The obstruction distance (OD) is shown to be greater than the required distance of 2*(OH - IH).</p>					

#### 4.0 2023 ANNUAL AMBIENT EQUIPMENT ASSESSMENT

Assessment Date: May 1<sup>st</sup>, 2023

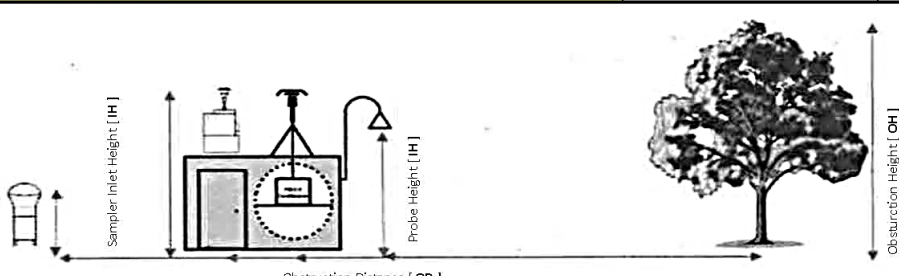
Site No.	Equipment	Equipment Supplier	Model No. & Serial No.	Condition	Years In Service	Equipment Type	Notes
470370040	CO monitor	Teledyne	T300 s/n 1360	Good	7	SLAMS	at NRS
470370040	CO monitor	Thermo	48i s/n 1172850016	Good	9	Back-up	in Air Lab
N/A	CO monitor	Thermo	48i s/n 1152990095	New	6	Back-up	in Air Lab - Large Drift
N/A	CO monitor	Thermo	48i-TLE s/n 1324658815	Good	10	Back-up	in Air Lab - Needs Maintenance
470370026	Data Logger	Agilaire	8832 s/n A2327K	Good	10	N/A	at PPD
470370040	Data Logger	Agilaire	8832 s/n A4689K	Good	10	N/A	at NRS
470370011	Data Logger	Agilaire	8832 s/n A4721K	Good	9	N/A	at EAST
N/A	Data Logger	Agilaire	8872 s/n 0320	New	7	Back-up	in Air Lab
N/A	Multi-Gas Calibrator	EnviroNics	6103 s/n 6587	New	9	PQAO	in Air Lab
N/A	Multi-Gas Calibrator	Teledyne	T750 s/n 61	New	8	PQAO	in Air Lab
470370011	Multi-gas Calibrator	Thermo	146i s/n 0827732246	Good	12	N/A	at EAST
470370040	Multi-Gas Calibrator	Thermo	146i s/n 1213752907	Good	10	N/A	at NRS
N/A	Multi-gas Calibrator	Thermo	146i s/n 1324658813	Good	10	Back-up	In Air Lab
N/A	Multi-gas calibrator	Thermo	146iQ s/n 1182890004	Good	4	Back-up	in Air Lab
N/A	NO-NO <sub>2</sub> -NO <sub>x</sub> monitor	Teledyne	T200 s/n 1625	Good	7	Back-up	in Air Lab - Needs Parts

Site No.	Equipment	Equipment Supplier	Model No. & Serial No.	Condition	Years In Service	Equipment Type	Notes
470370011	NO-NO <sub>2</sub> -NO <sub>x</sub> monitor	Thermo	42i s/n 1153030011	Good	11	SLAMS	at EAST
N/A	NO-NO <sub>2</sub> -NO <sub>x</sub> monitor	Thermo	42i s/n 1105247201	Good	7	Back-up	in Air Lab - Needs Maintenance
N/A	NO-NO <sub>2</sub> -NO <sub>x</sub> monitor	Thermo	42iQ s/n 1190310001	Good	4	Back-up	in Air Lab
470370040	NO-NO <sub>2</sub> -NO <sub>x</sub> monitor	Thermo	42i-TL s/n 1324658812	Good	9	SLAMS	at NRS
N/A	O <sub>3</sub> monitor	Thermo	49i s/n CM09130037	Good	10	Back-up	in Air Lab
470370011	O <sub>3</sub> monitor	Thermo	49i s/n 1322458652	Good	10	SLAMS	at EAST
470370026	O <sub>3</sub> monitor	Thermo	49i s/n 1322458653	Good	6	SLAMS	at PPD
N/A	O <sub>3</sub> generator	Teledyne	703E s/n 296	Good	20	N/A	in Air Lab - RETIRED
470370026	O <sub>3</sub> generator	Teledyne	T703 s/n 220	Good	9	Back-up	at PPD
N/A	O <sub>3</sub> generator	Teledyne	T703 s/n 670	New	4	Back-up	in Air Lab
470370011	O <sub>3</sub> generator	Teledyne	T703 s/n 671	Good	4	Back-up	at EAST
N/A	O <sub>3</sub> generator	Thermo	49iPS s/n 1333159739	Ok	10	Primary Standard	in Air Lab - Needs Parts
N/A	PM <sub>10</sub> /PM <sub>2.5</sub> monitor	Teledyne	T640x s/n 991	Good	3	Back-up	in Air Lab
470370023	PM <sub>10</sub> /PM <sub>2.5</sub> monitor	Teledyne	T640x s/n 993	Good	3	SLAMS	at LL
N/A	PM <sub>2.5</sub> monitor	Met One	BAM 1022 s/n A15450	New	3	Back-up	in Air Lab
N/A	PM <sub>2.5</sub> monitor	Met One	BAM 1022 s/n T23706	Good	7	Back-up	in Air Lab - Needs Parts
470370023	PM <sub>2.5</sub> monitor	Met One	BAM 1022 s/n U16171	New	6	SLAMS	at LL



Site No.	Equipment	Equipment Supplier	Model No. & Serial No.	Condition	Years In Service	Equipment Type	Notes
470370040	PM <sub>2.5</sub> monitor	Met One	BAM 1022 s/n W21428	Good	5	SLAMS	at NRS
N/A	PM <sub>2.5</sub> monitor	Thermo	2025i s/n 2025i20216204	Good	10	Back-up	in Air Lab
N/A	PM <sub>2.5</sub> monitor	Thermo	2025i s/n 2025i202281205	Good	9	Back-up	in Air Lab
470370023	PM <sub>2.5</sub> monitor	Thermo	2025i s/n 2025iW207831504	Good	10	SLAMS	at LL
N/A	PM <sub>2.5</sub> monitor	Thermo	TEOM 1405 s/n 1405A238271610	New	6	Back-up	in Air Lab
N/A	SO <sub>2</sub> monitor	Thermo	43i s/n 1303156453	OK	8	Back-up	in Air Lab - Needs Parts
N/A	SO <sub>2</sub> monitor	Thermo	43i s/n 1324500911	Good	9	Back-up	in Air Lab
470370040	SO <sub>2</sub> monitor	Thermo	43iQ s/n 1182890005	Good	4	SLAMS	at NRS
470370011	Zero Air System	Thermo	111 s/n 0518112050	Good	12	N/A	at EAST
470370026	Zero Air System	Thermo	111 s/n 0827732247	Good	14	N/A	at PPD
470370040	Zero Air System	Thermo	111 s/n 1313057860	Good	10	N/A	at NRS
N/A	Zero Air System	Thermo	111 s/n 1333159730	Ok	10	Back-up	in Air Lab

5.0 **APPENDIX A – 2023 SITE EVALUATION FORM**

SITING EVALUATION FIELD FORM					Rev. 4/12/23
Metro Public Health Department Air Pollution Lab PCD-AM-020					
Site Name: _____				Date: _____	
AQS I.D.: _____				Time: _____	
Coordinates: _____				Inspected by: _____	
Scale: _____				Signature: _____	
LIST EQUIPMENT USED					
PARTICULATE MONITORS					
	Units	PM2.5	PM2.5 Collocated	PM10	
Probe Inlet Height [ IH ]	m				
Distance to nearest road	m				
Obstruction Type	/				
Obstruction Height [ OH ]	m				
Obstruction Distance [ OD ]	m				
Collocated Distance	m				
Unrestricted Airflow	degrees				
Dripline	m				
GASEOUS MONITORS					
	Units	CO	OZONE	NOx	SO2
Probe Inlet Height [ IH ]	m				
Distance to nearest road	m				
Obstruction Type	/				
Obstruction Height [ OH ]	m				
Obstruction Distance [ OD ]	m				
Collocated Distance	m				
Unrestricted Airflow	degrees				
Dripline	m				
				YES/NO	PASS/FAIL
Are all probes at least 1 meter apart?					
Are all probes located in an area that is paved or has vegetative ground cover?					
Are all rooftop samplers located at least 2 meters away from any structures?					
There MUST be 270 degrees of unrestricted airflow around the probe or sampler.					
Obstruction Distance MUST be $\geq 2*(OH - IH)$ .					
Dripline must be at least 10m away when tree is an obstruction.					
 <p>The diagram illustrates the siting requirements for a monitor. On the left, a sampler is shown with its inlet height (IH) indicated. In the center, a monitor is shown with its probe height (IH) indicated. On the right, a tree is shown with its obstruction height (OH) indicated. The obstruction distance (OD) is the horizontal distance from the monitor to the tree. The diagram shows that the probe height must be greater than the obstruction height, and the obstruction distance must be at least twice the difference between the obstruction height and the probe height.</p>					

6.0 **APPENDIX B – NASHVILLE-DAVIDSON COUNTY 2022 APPLICATION FOR EXCLUSION OF TELEDYNE T640X PM<sub>2.5</sub> CONTINUOUS FEM DATA FROM COMPARISON TO NAAQS**

**Nashville-Davidson County  
2022  
Application for Exclusion of Teledyne  
T640x PM<sub>2.5</sub> Continuous FEM Data from  
Comparison to NAAQS**

Prepared by Nicole Rondeau



*Metro* **Public Health** *Dept*  
Nashville/Davidson County  
**Promoting and Protecting Health**

Nashville Davidson County  
Application for Exclusion  
October 2022

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Nashville Davidson County  
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## 1.0 Introduction

The Lockeland Elementary School monitoring site began operation in 1999 and is still our organization's primary PM<sub>2.5</sub> monitoring site. Starting July 1, 2019, an FEM (POC 3) MetOne BAM 1022 PM<sub>2.5</sub> monitor was added to this site to replace the FRM Thermo 2025i (POC 1) monitor. The decision to replace the FRM with an FEM was justified in the 2019 Annual Network Plan and approved by EPA. Since that date, we have employed several additional FEM PM<sub>2.5</sub> monitors, primarily used for AQI reporting, including a Thermo TEOM1405s (POC 3) and a Teledyne T640x (POC 4). The principal advantage of operating a PM<sub>2.5</sub> continuous FEM is that it can support both the AQI, while also supplying data that are eligible for comparison to the NAAQS. Thus, our organization was able to minimize the number of filter-based FRMs operated in the network. These filter-based FRMs are resource intensive in that they require field operations as well as pre- and post-sampling laboratory analysis which results in data not being available for approximately 2-4 weeks after sample collection.

Due to a Tornado that occurred on March 3rd, 2020, all equipment previously at this site was damaged beyond repair. In August/September 2020 this site was reequipped with new Air Monitors and was able to begin capturing air quality data again. Some changes were made to the monitors that were previously on site; the two Thermo TEOM 1405s that ran PM<sub>2.5</sub> (AQI) and PM<sub>10</sub> were replaced with a single piece of equipment, the Teledyne T640x, which can measure both criteria pollutants at once. We received a 2-year NAAQS exclusion for the T640x PM<sub>2.5</sub> data from September 1, 2020, until August 31, 2022. All the PM<sub>2.5</sub> FEM and FRM monitors that are currently operating in our network can be found in "Table 2: Nashville Davidson County PM<sub>2.5</sub> Monitors" below.

Although the PM<sub>2.5</sub> continuous FEMs are automated methods, these methods still require careful attention in their set-up, operation, and validation of data. Once the 2-year NAAQS exclusion period ended for the FEM PM<sub>2.5</sub> T640x (POC 4) monitor, we began to evaluate the performance of this method compared to the collocated FRM Thermo 2025i (POC 2). That evaluation is explained further below and includes our recommendations on the use of the data from the FEM Teledyne T640x monitor.

## 2.0 Request for Exclusion of PM<sub>2.5</sub> Continuous FEM data from Comparison to the NAAQS

In accordance with the PM NAAQS rule published on January 15<sup>th</sup>, 2013 (78 FR 3086) and specific to the provisions detailed in §58.10 (b)(13) and §58.11 (e) we are requesting that data from the following monitor be set aside for comparison to the NAAQS. While our agency is working to optimize the monitoring instrumentation, we use to meet all our monitoring objectives, we are not yet at a point where the comparability of this PM<sub>2.5</sub> continuous FEM operated in our network compared to the collocated FRM is acceptable such that we are comfortable using this continuous FEM data for comparison to the NAAQS. After assessing the comparability of this PM<sub>2.5</sub> FEM to the collocated FRM for our network, we have determined that the site listed below does not meet the comparability requirements. A detailed one-page assessment from which the information described below was obtained are included at the end of this section.

Nashville Davidson County  
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**Table 1: Request for Exclusion of PM<sub>2.5</sub> Continuous FEM Data**

Site Name	City	Site ID	Cont. POC	Method Description	PM <sub>2.5</sub> Cont. Begin Date	PM <sub>2.5</sub> Cont. End Date	Continuous/FRM Sampler pairs per season	Slope (m)	Intercept (y)	Meets bias requirement	Correlation (r)
<i>Sites with PM<sub>2.5</sub> continuous FEMs that are collocated with FRMs:</i>											
Lockeland	Nashville	47-037-0023	4	Teledyne T640X at 16.67 LPM (Broadband Spectroscopy)	Sept 1 2020	Aug 31 2022	Winter = 29 Spring = 30 Summer = 21 Fall = 26 Total = 106	1.15	+0.67	no	0.96

### 3.0 Period of Exclusion of Data from the PM<sub>2.5</sub> Continuous FEMs

The above table details the period of available data by monitor for which we are basing our recommendation to exclude PM<sub>2.5</sub> continuous FEM data.

Per EPA Regional Office approval, we will load or move as necessary these data to EPA’s AQS database in a manner where the data are only used for the appropriate monitoring objective(s) (i.e., use data for both the NAAQS and AQI, just the AQI, or neither the NAAQS nor AQI). Additionally, we will continue to load any new data generated in the same manner until such time as we request and receive approval from the EPA Regional Office to change the monitoring objectives that the data from the PM<sub>2.5</sub> continuous FEM can support.

### 4.0 PM<sub>2.5</sub> Continuous FEM data for Reporting the AQI

While we are requesting the monitor above not be used for comparison to the NAAQS, we do believe that the data are of sufficient comparability to the collocated FRM that they be used in AQI reporting. Therefore, with EPA Regional Office approval we will continue to report these data to AIRNow ([www.airnow.gov](http://www.airnow.gov)). Additionally, we intend to store the data in EPA’s AQS database that is used for “acceptable AQI” reporting (i.e., parameter code 88502) so that data users will know that these data are appropriate for use in AQI calculations.

### 5.0 Continued Operation of PM<sub>2.5</sub> Monitors to Support NAAQS and AQI Reporting

While we are requesting that data from the monitor listed above be set aside for comparison to the NAAQS, we will continue to operate the PM<sub>2.5</sub> FRM and other PM<sub>2.5</sub> FEM monitors to support the objective of comparison to the NAAQS and AQI reporting. All PM<sub>2.5</sub> Monitors that are currently operated in our network can be seen in the table below. Each of these FRM and PM<sub>2.5</sub> continuous monitors will be operated so to meet the objectives of the Network Design Criteria for Ambient Air Quality Monitoring described in Appendix D to Part 58.

Nashville Davidson County  
 Application for Exclusion  
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**Table 2: Nashville Davidson County PM<sub>2.5</sub> Monitors**

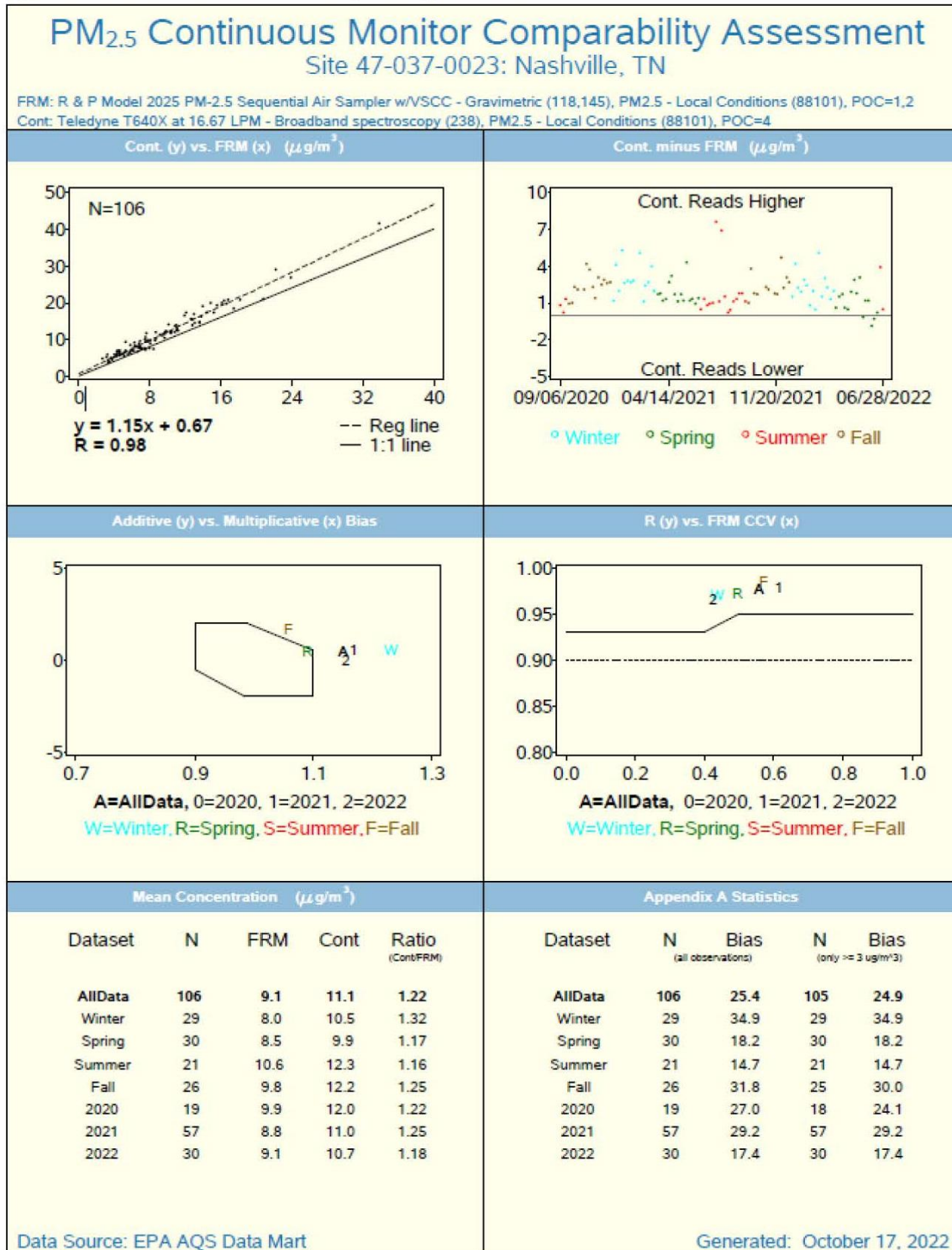
Site Name	Site ID	POC	Method Description
Lockeland	47-037-0023	2	R & P Model 2025 PM-2.5 Sequential Air Sampler w/ VSCC (Gravimetric)
Lockeland	47-037-0023	3	Met One BAM-1022 Mass Monitor w/ VSCC or TE-PM2.5C (Beta Attenuation)
Lockeland	47-037-0023	4	Teledyne T640X at 16.67 LPM (Broadband Spectroscopy)
Near Road	47-037-0040	3	Met One BAM-1022 Mass Monitor w/ VSCC or TE-PM2.5C (Beta Attenuation)

## 6.0 Assessment

The following one-page assessment relates to the site where our agency has the collocated PM<sub>2.5</sub> FRM and the PM<sub>2.5</sub> FEM Teledyne T640x continuous monitor. This assessment is represented in Table 1 “Request for Exclusion of PM<sub>2.5</sub> Continuous FEM Data” above, in section 2.0 “Request for Exclusion of PM<sub>2.5</sub> Continuous FEM data from Comparison to the NAAQS”.

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Figure 1: PM<sub>2.5</sub> Continuous Monitor Comparability Assessment





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## 7.0 Determining if Bias Criteria Has Been Met

We inspected the Additive (y) vs. Multiplicative (x) Bias in the figure on the middle-left side of the one-page assessment below, determining whether the combination of the multiplicative (slope) and additive (intercept) bias was inside or outside the required test specification. In our case “A” appears outside the box, which indicates that this bias does not meet the acceptance criteria.

We wanted to ensure that the combination of the multiplicative (slope) and additive (intercept) bias was outside the required test specifications, so we looked individually at both the Slope of regression relationship and the Intercept of regression relationship to see if they were both outside their test specifications.

With a slope of 1.15, the slope of regression relationship does not meet the test specification of  $1 \pm 0.10$ . Furthermore, with an intercept of +0.67, the intercept of regression relationship does not meet the specification of between:  $15.05 - (17.32 \times \text{slope})$ , but not less than -2.0; and  $15.05 - (13.20 \times \text{slope})$ , but not more than + 2.0. This can be seen in the calculations below.

$15.05 - (17.32 \times 1.15) = -4.87$ , which is more negative than -2.0. Therefore -2.0 was used as the most negative the intercept can be with a slope of 1.15.

$15.05 - (13.20 \times 1.15) = -0.13$ , which is within the maximum +2.0. Therefore -0.13 was used as the most positive the intercept can be with a slope of 1.15.

These results confirm that the overall bias has not been met.

**2023 Ambient Air Monitoring Plan**

**Shelby County Health Department**

**Air Pollution Control Program**

**Including the Metropolitan Statistical Area**

**(Memphis, TN-MS-AR)**



**Public Health**  
Prevent. Promote. Protect.

**May 16, 2023**

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# **I. Introduction to the 2023 Ambient Air Monitoring Plan**

## **Shelby County Health Department**

### **Pollution Control Section**

#### **Air Monitoring Branch**

The Shelby County Health Department (SCHD) Air Monitoring Branch (AMB) is required to evaluate the ambient air monitoring network each year in accordance with the requirements specified in 40 CFR Part 58, Subpart B § 58.10. An overview of the geography, general climate, wind direction and population trends are included to provide background information that will assist in understanding the current air monitoring network and reasons for placement of the existing monitoring sites.

The principal areas in Shelby County with air monitoring sites are depicted showing the location for each of the monitoring sites. The sites are identified by a site number, site name, site address, an air quality site identification number and the types of pollutants monitored at each location. Tables containing relevant information are also included. A Network Review that requests for changes or provides updates is included along with the Memorandum of Agreement between Crittenden County, AR and Desoto County, MS.

This Network Plan submitted by Shelby County will be incorporated with the other local programs from the State of Tennessee and included in the 2023 Annual Network Plan provided by the State of Tennessee Department of Environment and Conservation Division of Air Pollution Control and submitted to the Region 4 offices of the Environmental Protection Agency by July 1 of each calendar year.

## II. Shelby County's Interpretation of Ambient Air Monitors Needed to Meet the 40CFR, Part 58 Requirements

Census Area Identification and Population Data			14129 Lead		42101 CO		42401 SO <sub>2</sub>		42602 NO <sub>2</sub>		44201 Ozone			81102 PM <sub>10</sub>		88101 PM <sub>2.5</sub>			88502 PM <sub>2.5</sub> Speciation		88502 PM <sub>2.5</sub> Continuous			
CBSA Code	Census 2010 /Est. 2019	CBSA Title (MS Areas)	Operating	Required	Operating	Required	Operating	Required	Operating	Required	Operating	2021-2023 8 Hr. DV	Required	Operating	Required	Operating	2021 -2023 Annual DV µg/m <sup>3</sup>	2021 -2023 24 Hr. DV µg/m <sup>3</sup>	Required	Operating	Required	Operating	Required	
32820	1316100/1346045	Memphis, TN-MS-AR	0	0	2 <sup>2</sup>	1	1 <sup>2</sup>	1	1 <sup>1,3</sup>	2	3	0.066 Shelby Farms NCore	2	2	2 - 4	3 <sup>1</sup>	8.6 SWTCC Near Road	19 SWTCC Near Road	2	1	1	1	1	1 - 2

<sup>1</sup>The Shelby County Health Department and the states of Arkansas and Mississippi have implemented a joint MOA that provides for meeting the MSA monitoring requirements for the combined MSA area. See page 48 in the Appendix.

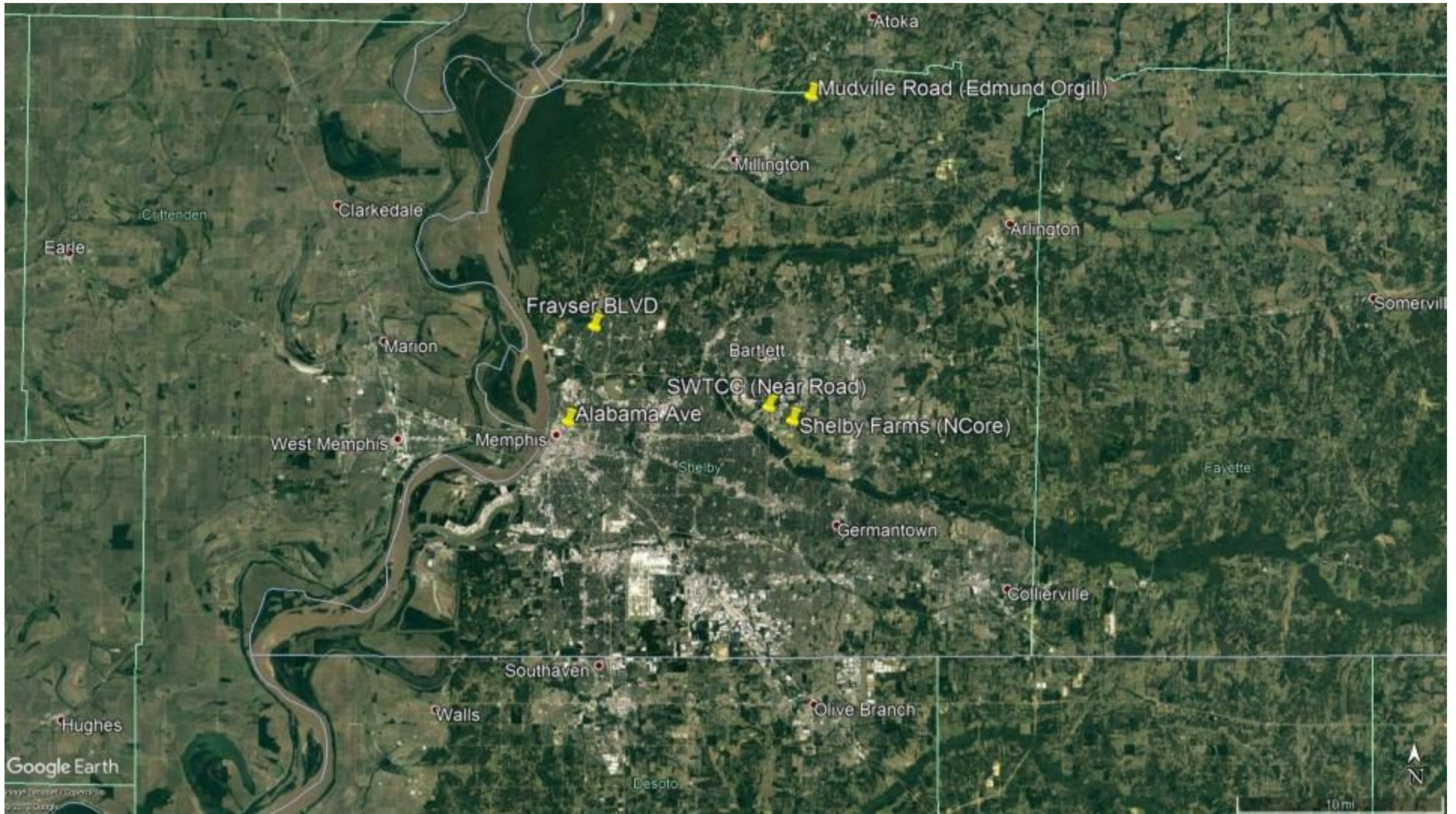
<sup>2</sup>Includes trace level analyzer at Shelby Farms NCore Air Monitoring Station

<sup>3</sup> Monitor located in Marion, Arkansas just to the northwest of downtown Memphis.

Discussions of any proposals to re-locate monitors in the next 18 months and suitability of PM<sub>2.5</sub> sites for use in comparisons to the annual PM<sub>2.5</sub> standard:

- The speciation POC 6 STN monitor are generally not suited to be used for comparisons to the annual PM<sub>2.5</sub> standards.
- The Teledyne API T640x PM<sub>2.5</sub> particulate monitor is used for comparison to the annual PM<sub>2.5</sub> standard and for AQI forecasting purposes.

### III. Map of Shelby County Site Locations



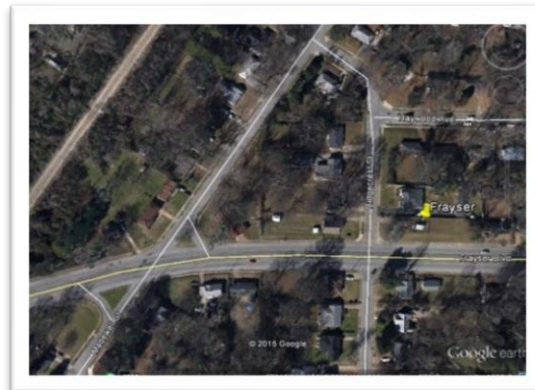
## **IV. Shelby County Air Monitoring Sites**

### **(Background, Discussion, Site Evaluation Form and Site Pictures)**

- A. Frayser
- B. Alabama
- C. Shelby Farms NCore
- D. Southwest Tennessee Community College Near Road
- E. Edmund Orgill Park

All SCHD AMB sites meet the siting criteria as found in 40 CFR Part 58, Appendix E for probe and monitoring path for particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen oxides (NO/NO<sub>2</sub>/NO<sub>y</sub>), and sulfur dioxide (SO<sub>2</sub>). These sites will be reevaluated annually for compliance with this criterion. These sites are part of the SCHD ambient air monitoring network and operated to ensure continued compliance to 40 CFR Part 58, Appendix D network design requirements. These sites are summarized in Section II. Current site evaluations with site pictures and distance measurements are provided in Section IV.

**A. Frayser, Shelby County, TN**



Reporting Org. Name	Memphis/Shelby County Health Dept.
PQAO	673
Address	1330 Frayser Blvd.
AQS ID	47-157-0021
County Name	Shelby
CBSA	32820
Latitude	35.217501
Longitude	-90.019707
Parameter Code	44201
Parameter Name	Ozone
Monitor Type	SLAMS
POC	1
Interval	1
Year	2023
Collection Frequency	Hourly
Method	087
FRM/FEM Monitoring Instrument	Teledyne Advanced Pollution Instrumentation, Inc. Model 400/400A/400E/T400
Analysis	Ultraviolet Absorption
Ref. Method ID	EQQA-0992-087
Monitor Objective Type	Population Exposure
Dominant Source	Area
Measurement Scale	Neighborhood
Land Use Type	Residential
Location Setting	Suburban
Date Site Established	19720901

**Site Background and Discussion**

This site is located on Frayser Blvd. in Shelby County, Tennessee and currently supports monitoring for ozone. This site was originally established in 1972 and is expected to operate during CY's 2023 and 2024.

This site is located downwind of the Metro-Memphis area in a heavily populated area. There are railroad tracks and an overpass that are approximately 250 meters west of the site.

**Site Evaluation Field Form**



**SITE NAME: FRAYSER**

**AQS Site ID: 47-157-0021 Location: 1330 Frayser Blvd. Date: 05/19/22 Evaluator: JL**

**Site Coordinates: LATITUDE 35.217501 LONGITUDE -90.019707**

**Monitoring Scale: Neighborhood**

<b>Pollutant</b>	<b>Sampler/Probe Inlet Height (IH in m)</b>	<b>Inlet Location</b>	<b>Horizontal Distance (m)</b>	<b>Vertical Distance (m)</b>	<b>Pass/Fail</b>
O <sub>3</sub>	4.46 m	Side of building	30 m	24.12 m	Pass

<b>Obstruction</b>	<b>Obstruction Height (OH)</b>	<b>Obstruction Distance (OD)</b>	<b>Dripline</b>	<b>Pass/Fail</b>
Tree east of site	25.12 m	$2 (25.12 - 4.46) = 41.32$ m	27 m	Pass

Dripline should be >20 m from the dripline of tree(s) and must be 10 m from the dripline when the tree(s) act as an obstruction.  
For Horizontal and Vertical Distances: Separation Distance = (1 meter for O<sub>3</sub>, CO, SO<sub>2</sub>, NO<sub>2</sub>) and (2 meters for PM, Pb)  
When probe is located on a rooftop, this separation distance is in reference to walls, parapets, or penthouses located on roof.

Are all probes at least 1 meter apart? Yes

Are all collocated low volume samplers between 1 to 4 meters apart? N/A

Are all collocated high volume samplers between 2 to 4 meters apart? N/A

Are all probes located in an area that is paved or has vegetative ground cover? Yes

Are all rooftop samplers located at least 2 meters away from any structure? Yes

Is there unrestricted air flow 270 degrees around the probe or sampler? Yes

### **Site Pictures for Frayser**

**Frayser (North)**



**Frayser (Northeast)**



**Frayser (East)**



**Frayser (Southeast)**



**Site Pictures for Frayser**

**Frayser (South)**



**Frayser (Southwest)**



**Frayser (West)**



**Frayser (Northwest)**



**B. Alabama Ave., Shelby County, TN**



Reporting Org. Name	Memphis/Shelby County Health Dept.		
PQAO	673		
Address	416 Alabama Ave.		
AQS ID	47-157-0024		
County Name	Shelby		
CBSA	32820		
Latitude	35.151194		
Longitude	-90.041559		
Parameter Code	88101	88101	88502
Parameter Name	PM 2.5	PM 2.5	PM 10
Monitor Type	SLAMS	SLAMS	SLAMS
POC	1	2	1
Interval	7	7	1
Year	2023	2023	2023
Collection Frequency	1 in 3	1 in 12	Hourly
Method	145	145	079
FRM/FEM Monitoring Instrument	Thermo 2025I PM 2.5 Sequential Sampler	Thermo 2025 PM 2.5 Sequential Sampler	Thermo Scientific TEOM 1405 Ambient Particulate Monitor
Analysis	Gravimetric	Gravimetric	Gravimetric
Ref. Method ID	RFPS-0498-118	RFPS-0498-118	EQPM-1090-079
Monitor Objective Type	Population Exposure	Population Exposure	Population Exposure
Dominant Source	Area	Area	Area
Measurement Scale	Neighborhood	Neighborhood	Neighborhood
Land Use Type	Residential	Residential	Residential
Location Setting	Suburban	Suburban	Suburban
Date Site Established	20170101	20210101	20160403

### **Site Background and Discussion**

The Alabama Ave. site is located in Shelby County, Tennessee and currently supports monitoring for PM<sub>2.5</sub>, PM<sub>10</sub> (TEOM) and the Radnet program. A collocated PM<sub>2.5</sub> sampler was added to the site at the beginning of 2021 to meet collocation requirements for PM<sub>2.5</sub> FRM sampling. This site is approximately 25 meters south of Interstate 40 and 50 meters north of apartment complexes. The site will continue to operate in CY's 2023 and 2024.

## Site Evaluation Field Form

**SITE NAME: ALABAMA**

**AQS Site ID: 47-157-0024 Location: 416 Alabama Ave. Date: 04/06/22 Evaluator: JL**

**Site Coordinates: LATITUDE 35.151194 LONGITUDE: -90.041559**

**Monitoring Scale: Neighborhood**

Pollutant	Sampler/Probe Inlet Height (IH in m)	Inlet Location	Horizontal Distance (m)	Vertical Distance (m)	Pass/Fail
PM <sub>2.5</sub> (POC 1)	2.03 m	Ground	20.3 m	22.3 m	Pass
PM <sub>2.5</sub> (POC 2)	2.03 m	Ground	16.2 m	22.3 m	Pass
PM <sub>10</sub> (TEOM) (continuous)	4.318 m	Roof	15.4 m	24.1 m	Pass

Obstruction	Obstruction Height (OH)	Obstruction Distance (OD)	Dripline	Pass/Fail
Larger tree NE of PM <sub>10</sub>	16.24 m	$2 (16.24 - 4.318) = 23.84$ m	24 m	Pass
Larger tree NE of the 2 PM <sub>2.5</sub>	16.24 m	$2 (16.24 - 2.03) = 28.42$ m	26 m	Pass

Dripline should be >20 m from the dripline of tree(s) and must be 10 m from the dripline when the tree(s) act as an obstruction.  
 For Horizontal and Vertical Distances: Separation Distance = (1 meter for O<sub>3</sub>, CO, SO<sub>2</sub>, NO<sub>2</sub>) and (2 meters for PM, Pb)  
 When probe is located on a rooftop, this separation distance is in reference to walls, parapets, or penthouses located on roof.

Are all probes at least 1 meter apart? Yes

Are all collocated low volume samplers between 1 to 4 meters apart? N/A

Are all collocated high volume samplers between 2 to 4 meters apart? N/A

Are all probes located in an area that is paved or has vegetative ground cover? Yes

Are all rooftop samplers located at least 2 meters away from any structure? Yes

Is there unrestricted air flow 270 degrees around the probe or sampler? Yes

**Site Pictures for Alabama**

**Alabama (North)**



**Alabama (Northeast)**



**Alabama (East)**



**Alabama (Southeast)**



**Site Pictures for Alabama**

**Alabama (South)**



**Alabama (Southwest)**



**Alabama (West)**

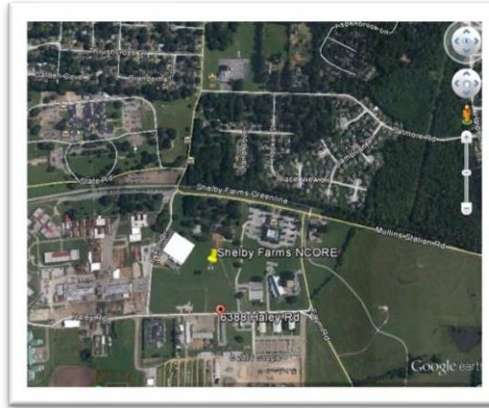


**Alabama (Northwest)**



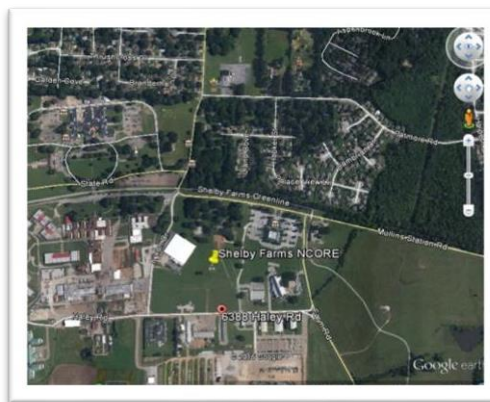


**C. Shelby Farms NCore,  
Shelby County, TN**



Reporting Org. Name		Memphis/Shelby County Health Dept.	
PQAO		673	
Address		6388 Haley Rd.	
AQS ID		47-157-0075	
County Name		Shelby	
CBSA		32820	
Latitude		35.151699	
Longitude		-89.850249	
Parameter Code	42101	42401	42600
Parameter Name	CO (trace)	SO <sub>2</sub> (trace)	NO <sub>y</sub>
Monitor Type	NCore (SLAMS)	NCore (SLAMS)	NCore (SLAMS)
POC	1	1	1
Interval	1	1	1
Year	2023	2023	2023
Collection Frequency	Hourly	Hourly	Hourly
Method	093	100	699
FRM/FEM Monitoring Instrument	Teledyne Advanced Pollution Instrumentation, Inc. Models 300/300E/300EU/T300/T300U	Teledyne Advanced Pollution Instrumentation, Inc. Models 100A/100E/100EU/T100/T100U	Teledyne Advanced Pollution Instrumentation, Inc. Models 200A/200AU/200E/200EU/T200/T200U
Analysis	Gas Filter Correlation	Ultraviolet Fluorescence	Chemiluminescence
Ref. Method ID	RFCA-1093-593	EQSA-0495-100	RFNA-1194-699
Monitor Objective Type	Population Exposure	Population Exposure	Population Exposure
Dominant Source	Area	Area	Area
Measurement Scale	Neighborhood and Urban Scale	Neighborhood and Urban Scale	Neighborhood and Urban Scale
Land Use Type	Industrial	Industrial	Industrial
Location Setting	Urban	Urban	Urban
Date Site Established	20110401	20110621	20110617

**C. Shelby Farms NCore,  
Shelby County, TN**



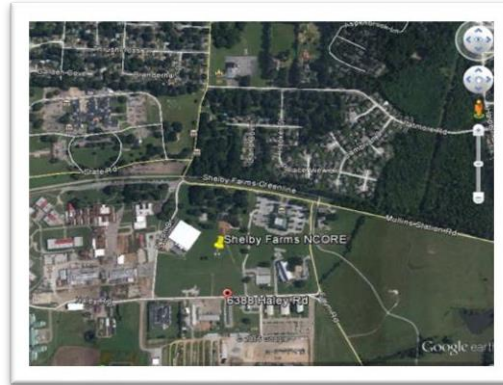
Reporting Org. Name		Memphis/Shelby County Health Dept.	
PQAO		673	
Address		6388 Haley Rd.	
AQS ID		47-157-0075	
County Name		Shelby	
CBSA		32820	
Latitude		35.151699	
Longitude		-89.850249	
Parameter Code	44201	61103	61104
Parameter Name	O <sub>3</sub>	Wind Speed-Resultant	Wind Direction - Resultant
Monitor Type	NCore (SLAMS)	NCore (SLAMS)	NCore (SLAMS)
POC	1	1	1
Interval	1	1	1
Year	2023	2023	2023
Collection Frequency	Hourly	Hourly	Hourly
Method	087	065	065
FRM/FEM Monitoring Instrument	Teledyne Advanced Pollution Instrumentation, Inc. Models 400E/T400/400/400A	RM Young Model 05305	RM Young Model 05305
Analysis	Ultraviolet Absorption	miles per hour	Degrees compass
Ref. Method ID	EQOA-0992-087	N/A	N/A
Monitor Objective Type	Population Exposure	Population Exposure	Population Exposure
Dominant Source	Area	Area	Area
Measurement Scale	Neighborhood and Urban Scale	Neighborhood and Urban Scale	Neighborhood and Urban Scale
Land Use Type	Industrial	Industrial	Industrial
Location Setting	Urban	Urban	Urban
Date Site Established	20110311	20120701	20120701

**C. Shelby Farms NCore,  
Shelby County, TN**



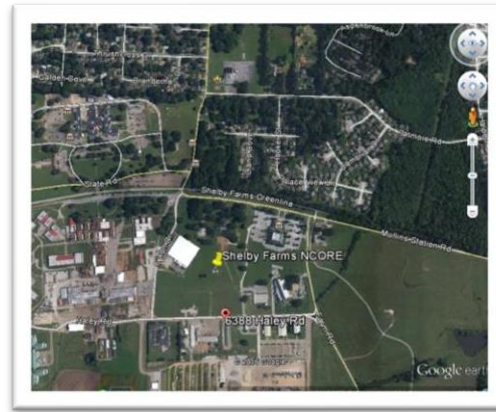
Reporting Org. Name		Memphis/Shelby County Health Dept.	
PQAO		673	
Address		6388 Haley Rd.	
AQS ID		47-157-0075	
County Name		Shelby	
CBSA		32820	
Latitude		35.151699	
Longitude		-89.850249	
Parameter Code	62101	62201	64101
Parameter Name	Outdoor Temperature	Relative Humidity	Barometric Pressure
Monitor Type	NCore (SLAMS)	NCore (SLAMS)	NCore (SLAMS)
POC	1	1	1
Interval	1	1	1
Year	2023	2023	2023
Collection Frequency	Hourly	Hourly	Hourly
Method	060	060	014
FRM/FEM Monitoring Instrument	RM Young 41382VC	RM Young 41382VC	Barometric Sensor
Analysis	percent relative humidity	degrees Fahrenheit	Millibars
Ref. Method ID	N/A	N/A	N/A
Monitor Objective Type	Population Exposure	Population Exposure	Population Exposure
Dominant Source	Area	Area	Area
Measurement Scale	Neighborhood and Urban Scale	Neighborhood and Urban Scale	Neighborhood and Urban Scale
Land Use Type	Industrial	Industrial	Industrial
Location Setting	Urban	Urban	Urban
Date Site Established	20120701	20120701	20120701

**C. Shelby Farms NCore,  
Shelby County, TN**



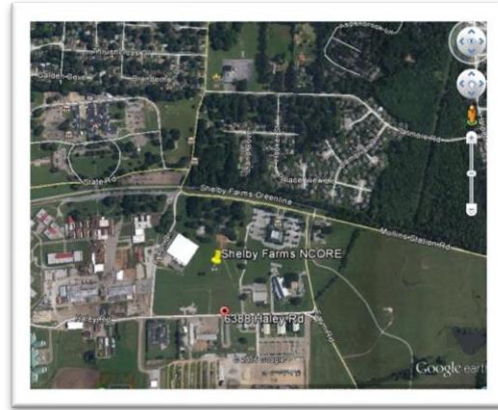
Reporting Org. Name		Memphis/Shelby County Health Dept.	
PQAO			673
Address			6388 Haley Rd.
AQS ID			47-157-0075
County Name			Shelby
CBSA			32820
Latitude			35.151699
Longitude			-89.850249
Parameter Code	81102 (STP)	81102 (LC)	88101
Parameter Name	PM <sub>10</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Monitor Type	NCore (SLAMS)	NCore (SLAMS)	NCore (SLAMS)
POC	3	4	3
Interval	1	1	1
Year	2023	2023	2023
Collection Frequency	Hourly	Hourly	Hourly
Method	239	239	238
FRM/FEM Monitoring Instrument	Teledyne Model T640 PM Mass Monitor with 640x option	Teledyne Model T640 PM Mass Monitor with 640x option	Teledyne Model T640 PM Mass Monitor with 640x option
Analysis	Light Scattering	Light Scattering	Light Scattering
Ref. Method ID	EQPM-0516-239	EQPM-0516-239	EQPM-0516-238
Monitor Objective Type	Population Exposure	Population Exposure	Population Exposure
Dominant Source	Area	Area	Area
Measurement Scale	Neighborhood and Urban Scale	Neighborhood and Urban Scale	Neighborhood and Urban Scale
Land Use Type	Industrial	Industrial	Industrial
Location Setting	Urban	Urban	Urban
Date Site Established	20210101	20210101	20210101

**C. Shelby Farms NCore,  
Shelby County, TN**



Reporting Org. Name		Memphis/Shelby County Health Dept.	
PQAO		673	
Address		6388 Haley Rd.	
AQS ID		47-157-0075	
County Name		Shelby	
CBSA		32820	
Latitude		35.151699	
Longitude		-89.850249	
Parameter Code	86101	88101	88502
Parameter Name	PM <sub>10-2.5</sub> (coarse)	PM <sub>2.5</sub>	PM <sub>2.5</sub> Speciation
Monitor Type	NCore (SLAMS)	NCore (SLAMS)	NCore (SLAMS)
POC	3	2	6
Interval	1	7	7
Year	2023	2023	2023
Collection Frequency	Hourly	1 in 3	1 in 3
Method	240	145	N/A
FRM/FEM Monitoring Instrument	Teledyne Model T640 PM Mass Monitor with 640x option	Thermo Partisol Plus 2025i PM 2.5 Sequential Sampler	Met One SASS 810/ URG 3000N
Analysis	Light Scattering	Gravimetric	Speciation Analysis
Ref. Method ID	EQPM-0516-240	RFPS-0498-118	N/A
Monitor Objective Type	Population Exposure	Population Exposure	Population Exposure
Dominant Source	Area	Area	Area
Measurement Scale	Neighborhood and Urban Scale	Neighborhood and Urban Scale	Neighborhood and Urban Scale
Land Use Type	Industrial	Industrial	Industrial
Location Setting	Urban	Urban	Urban
Date Site Established	20210101	20160101	20110208

**C. Shelby Farms NCore,  
Shelby County, TN**



Reporting Org. Name	Memphis/Shelby County Health Dept.	
PQAO	673	
Address	6388 Haley Rd.	
AQS ID	47-157-0075	
County Name	Shelby	
CBSA	32820	
Latitude	35.151699	
Longitude	-89.850249	
Parameter Code	42602	61301
Parameter Name	NO <sub>2</sub>	Mixing Height
Monitor Type	NCore (PAMS)	NCore (PAMS)
POC	1	1
Interval	1	1
Year	2023	2023
Collection Frequency	Hourly	Hourly
Method	212	128
FRM/FEM Monitoring Instrument	Teledyne Advanced Pollution Instrumentation T500U Nitrogen Dioxide Analyzer	Vaisala CL-51
Analysis	Chemiluminescence	Meters
Ref. Method ID	EQNA-0514-212	N/A
Monitor Objective Type	Population Exposure	Population Exposure
Dominant Source	Area	Area
Measurement Scale	Neighborhood and Urban Scale	Neighborhood and Urban Scale
Land Use Type	Industrial	Industrial
Location Setting	Urban	Urban
Date Site Established	20210601	20210601

### **Site Background and Discussion for Shelby Farms NCore**

The Shelby Farms NCore site is located in Shelby County Tennessee and currently supports monitoring for carbon monoxide (trace), ozone, total reactive nitrogen (trace), particulate matter (PM<sub>2.5</sub>; PM<sub>10-2.5</sub> and PM<sub>10</sub>, sulfur dioxide (trace), and meteorological data (ambient temperature, barometric pressure, relative humidity, wind direction and wind speed).

This site was established in 2011 and is expected to operate in CY's 2023 and 2024.

The placement of the NCore site is east of the urban core and provides the best location for measuring transport and secondary pollutant formation from that area. The site is located downwind of the more industrialized areas.

By June 1, 2021, the SCHD AMB began PAMS monitoring. The updated regulations in 40 CFR Part 58 Appendix D Section 5.0 promulgated in October 2015 prescribe the updates to the required PAMS monitoring. This was associated with the revision to the 8-hour ozone NAAQS. These revised regulations standardized the operation of the PAMS network at approximately 43 geographically separated PAMS required sites and required the measurement of a common list of pollutants and meteorological parameters. The updated regulations required PAMS monitoring at each NCore site within a CBSA having a population of 1,000,000 persons or more. To meet the requirements in the regulations promulgated in October 2015, all PAMS Required Sites were to be operational and reporting quality assured and validated data for the required parameters to the EPA's Air Quality System by June 1, 2019. Due to a number of issues related to the startup of PAMS, the new start date was postponed to June 1, 2021. The SCHD Air Monitoring Branch is currently analyzing for the pollutants listed in the tables above. In addition to the parameters mentioned, the following descriptions and the table below of new pollutants and parameters are measured at the NCore station to meet PAMS requirements in addition to solar radiation, UV radiation and precipitation. These three (3) meteorological parameters may begin operation by the start of PAMS season if the delivery of the items and installation are performed in time.

- The priority speciated VOCs (classified as olefin, aromatic, paraffin, halogenated, monoterpene olefin, alkyne, or alcohol) as well as the total non-methane organic carbon (TNMOC) are analyzed using the airmoVOC C6-C12 with the Lead Technical Specialist, airmoCAL, airmoVOC C2-C6, and Hydroxychrom – hydrogen generator manufactured by Chromatotec and provided by Consolidated Analytical Systems (CAS). Hourly averaged concentration of each priority speciated VOC are collected and reported. Samples are collected from June 1 through August 31. The inlet height is 4.1 m from the ground. The sample tubing is made of stainless steel and is attached to the side of the building. The stainless steel tubing is inside of conduit that is bent and 1 meter away from the side of the building. The instrument began operation by June 1 and through the PAMS season. The instrument will operate for the 2023 PAMS season. Consolidated Analytical Systems (CAS) performed both calibration and maintenance May 9<sup>th</sup> through 11<sup>th</sup> 2023.

- Carbonyl sampling will be conducted on a frequency of three sequential 8-hour samples on a one-in-three-day sample schedule (~ 90 samples per PAMS sampling season). The TO-11A method provided by ATEC will be used to collect the samples. Samples were collected for the 2022 PAMS season and will be collected for the 2023 PAMS season. The sample inlet probe height is 4 meters above ground level.
- The true NO<sub>2</sub> analyzer is installed and the sample inlet is 4 meters above the ground. The analyzer operated for the 2022 PAMS season and will operate for the 2023 PAMS season.
- The Air Monitoring Branch purchased the solar radiation, UV radiation and precipitation bucket for the PAMS site. The instruments were installed 06/17/2022 and operated during the 2022 PAMS season and will operate the 2023 PAMS season also.



## Priority and Optional PAMS Chemical Parameters

Priority Chemical Parameters (Required)	AQS Parameter Code	Compound Class	Optional Chemical Parameters	AQS Parameter Code	Compound Class
1,2,3-trimethylbenzene	45225	aromatic	1,3,5-trimethylbenzene	45207	aromatic
1,2,4-trimethylbenzene	45208	aromatic	1-pentene	43224	olefin
1-butene	43280	olefin	2,2-dimethylbutane	43244	paraffin
2,2,4-trimethylpentane	43250	paraffin	2,3,4-trimethylpentane	43252	paraffin
<sup>a</sup> acetaldehyde	<b>43503</b>	<b>carbonyl</b>	2,3-dimethylbutane	43284	paraffin
benzene	45201	aromatic	2,3-dimethylpentane	43291	paraffin
cis-2-butene	43217	olefin	2,4-dimethylpentane	43247	paraffin
ethane	43202	paraffin	2-methylheptane	43960	paraffin
ethylbenzene	45203	aromatic	2-methylhexane	43263	paraffin
ethylene	43203	olefin	2-methylpentane	43285	paraffin
<sup>a</sup> formaldehyde	<b>43502</b>	<b>carbonyl</b>	3-methylheptane	43253	paraffin
isobutane	43214	paraffin	3-methylhexane	43249	paraffin
isopentane	43221	paraffin	3-methylpentane	43230	paraffin
isoprene	43243	olefin	<sup>a</sup> acetone	<b>43551</b>	<b>carbonyl</b>
m&p-xylenes	45109	aromatic	acetylene	43206	alkyne
m-ethyltoluene	45212	aromatic	cis-2-pentene	43227	olefin
n-butane	43212	paraffin	cyclohexane	43248	paraffin
n-hexane	43231	paraffin	cyclopentane	43242	paraffin
n-pentane	43220	paraffin	isopropylbenzene	45210	aromatic
o-ethyltoluene	45211	aromatic	m-diethylbenzene	45218	aromatic
o-xylene	45204	aromatic	methylcyclohexane	43261	paraffin
p-ethyltoluene	45213	aromatic	methylcyclopentane	43262	paraffin
propane	43204	paraffin	n-decane	43238	paraffin
propylene	43205	olefin	n-heptane	43232	paraffin
styrene	45220	aromatic	n-nonane	43235	paraffin
toluene	45202	aromatic	n-octane	43233	paraffin
trans-2-butene	43216	olefin	n-propylbenzene	45209	aromatic
total non-methane organic carbon	43102	total VOCs, non-methane	n-undecane	43954	paraffin
			p-diethylbenzene	45219	aromatic
			trans-2-pentene	43226	olefin
			$\alpha$ -pinene	43256	monoterpene olefin
			$\beta$ -pinene	43257	monoterpene olefin
			1,3 butadiene	43218	olefin
			<sup>a</sup> benzaldehyde	<b>45501</b>	<b>carbonyl</b>
			carbon tetrachloride	43804	halogenated
			ethanol	43302	alcohol
			tetrachloroethylene	43817	halogenated

<sup>a</sup>carbonyl sampler measurements

## Site Evaluation Field Form

**SITE NAME: SHELBY FARMS NCore**

**AQS Site ID: 47-157-0075 Location: 6388 Haley Rd. Date: 04/14/22 Evaluator: JL**

**Site Coordinates: LATITUDE 35.151699 LONGITUDE -89.850249**

**Monitoring Scale: Neighborhood and Urban Scale**

Pollutant	Sampler/Probe Inlet Height (IH in m)	Inlet Location	Horizontal Distance (m)	Vertical Distance (m)	Pass/ Fail
PM <sub>2.5</sub> (collocated)	4.7 m	On scaffolding	13.7 m	8.2 m	Pass
PM <sub>2.5</sub> , PM <sub>10</sub> , PM <sub>10-2.5</sub> (T640x)	4.7 m	Roof	13.7 m	8.2 m	Pass
CO	3.8 m	Side of shelter	15.2 m	8.2 m	Pass
NO <sub>y</sub> , NO	10 m	Met tower	25.2 m	18.2 m	Pass
O <sub>3</sub>	3.7 m	Side of shelter	15.2 m	8.2 m	Pass
SO <sub>2</sub>	3.6 m	Side of shelter	15.2 m	8.2 m	Pass

Obstruction	Obstruction Height (OH)	Obstruction Distance (OD)	Dripline	Pass/Fail
PAMS shelter north of NCore shelter (PM <sub>2.5</sub> )	8.2 m	$2 (8.2 - 4.7) = 7 \text{ m}$	86 m to tree east of shelter	Pass
PAMS shelter north of NCore shelter (T640x)	8.2 m	$2 (8.2 - 4.7) = 7 \text{ m}$	86 m to tree east of shelter	Pass
PAMS shelter north of NCore shelter (CO)	8.2 m	$2 (8.2 - 3.8) = 8.8 \text{ m}$	86 m to tree east of shelters	Pass
PAMS shelter north of NCore shelter (NO, NO <sub>y</sub> )	8.2 m	$2 (18.2 - 10) = 16.4 \text{ m}$	86 m to tree east of shelters	Pass
PAMS shelter north of NCore shelter (SO <sub>2</sub> )	8.2 m	$2 (8.2 - 3.6) = 9.2 \text{ m}$	86 m to tree east of shelters	Pass

Dripline should be >20 m from the dripline of tree(s) and must be 10 m from the dripline when the tree(s) act as an obstruction.  
For Horizontal and Vertical Distances: Separation Distance = (1 meter for O<sub>3</sub>, CO, SO<sub>2</sub>, NO<sub>2</sub>) and (2 meters for PM, Pb)  
When probe is located on a rooftop, this separation distance is in reference to walls, parapets, or penthouses located on roof.

Are all probes at least 1 meter apart? Yes

Are all collocated low volume samplers between 1 to 4 meters apart? Yes

Are all collocated high volume samplers between 2 to 4 meters apart? N/A

Are all probes located in an area that is paved or has vegetative ground cover? Yes

Are all rooftop samplers located at least 2 meters away from any structure? Yes

Is there unrestricted air flow 270 degrees around the probe or sampler? Yes

## Site Pictures for Shelby Farms NCore

**Shelby Farms NCore (North)**



**Shelby Farms NCore (Northeast)**



**Shelby Farms NCore (East)**



**Shelby Farms NCore (Southeast)**



## Site Pictures for Shelby Farms NCore

**Shelby Farms NCore (South)**



**Shelby Farms NCore (Southwest)**



**Shelby Farms NCore (West)**



**Shelby Farms NCore (Northwest)**



**D. Southwest Tennessee Community College,  
Near Road Monitoring Station, Shelby County, TN**



Reporting Org. Name	Memphis/Shelby County Health Dept.	
PQAO	673	
Address	5767 Macon Cove	
AQS ID	47-157-0100	
County Name	Shelby	
CBSA	32820	
Latitude	35.161264	
Longitude	-89.870646	
Parameter Code	42101	42602
Parameter Name	CO (trace)	NO <sub>2</sub> (trace)
Monitor Type	Near Road (SLAMS)	Near Road (SLAMS)
POC	1	1
Interval	1	1
Year	2023	2023
Collection Frequency	hourly	hourly
Method	593	599
FRM/FEM Monitoring Instrument	Teledyne Advanced Pollution Instrumentation, Inc. Models 300/300E/300EU/T300/T300U	Teledyne Advanced Pollution Instrumentation, Inc. Models 200A/200AU/200E/200EU/T200/T200U
Analysis	Gas Filter Correlation	Chemiluminescence
Ref. Method ID	RFCA-1093-593	RFNA-1194-599
Monitor Objective Type	Highest Concentration	Highest Concentration
Dominant Source	Mobile	Mobile
Measurement Scale	Neighborhood and Urban Scale	Neighborhood and Urban Scale
Land Use Type	Residential	Residential
Location Setting	Urban	Urban
Date Site Established	20140715	20140701

**D. Southwest Tennessee Community College,  
Near Road Monitoring Station, Shelby County, TN**



Reporting Org. Name	Memphis/Shelby County Health Dept.
PQAO	673
Address	5767 Macon Cove
AQS ID	47-157-0100
County Name	Shelby
CBSA	32820
Latitude	35.161264
Longitude	-89.870646
Parameter Code	88101
Parameter Name	PM <sub>2.5</sub>
Monitor Type	Near Road (SLAMS)
POC	1
Interval	7
Year	2023
Collection Frequency	1 in 3
Method	118
FRM/FEM Monitoring Instrument	Thermo 2025I PM 2.5 Sequential Sampler
Analysis	Gravimetric
Ref. Method ID	RFPS-0498-118
Monitor Objective Type	Highest Concentration
Dominant Source	Mobile
Measurement Scale	Neighborhood and Urban Scale
Land Use Type	Residential
Location Setting	Urban
Date Site Established	20170101

### **Site Background and Discussion for Southwest TN Community College Near Road**

The SWTCC Near Road site is located in Shelby County Tennessee and currently supports monitoring for carbon monoxide, nitrogen dioxide and particulate matter (PM<sub>2.5</sub>)

This site was established in 2014 and is expected to operate in CY's 2023 and 2024.

The placement of the Near Road site is along Interstate 40 between Interstate 240/40 and Sycamore View. The exact location is on the south side of Interstate 40 on the northeast corner of Southwest Tennessee Community College's campus parking lot. This site was selected based on the six factors the EPA determined were necessary to capture short-term nitrogen dioxide (NO<sub>2</sub>) concentrations near heavily trafficked roads, to assess area-wide (or community-wide) NO<sub>2</sub> concentrations, and to assess NO<sub>2</sub> concentrations for vulnerable and susceptible populations.



## Site Evaluation Field Form

**SITE NAME: SOUTHWEST TENNESSEE COMMUNITY COLLEGE (Near Road)**

**AQS Site ID: 47-157-0100 Location: 5787 Macon Cv. Date: 04/12/22 Evaluator: JL**

**Site Coordinates: LATITUDE 35.161264 LONGITUDE: -89.870646**

**Monitoring Scale: Neighborhood and Urban Scale**

Pollutant	Sampler/Probe Inlet Height (IH in m)	Inlet Location	Horizontal Distance (m)	Vertical Distance (m)	Pass/ Fail
CO	4.2 m	roof	23 m	27.0 m	Pass
NO <sub>2</sub>	4.2 m	roof	23 m	27.0 m	Pass
PM <sub>2.5</sub>	4.5 m	roof	23 m	27.0 m	Pass

Obstruction	Obstruction Height (OH)	Obstruction Distance (OD)	Dripline	Pass/Fail
Tree South Southwest of Station (CO, NO <sub>2</sub> )	27.0 m	2 (27.0 - 4.2) = 45.6 m	19 m	Pass

Dripline should be >20 m from the dripline of tree(s) and must be 10 m from the dripline when the tree(s) act as an obstruction.

For Horizontal and Vertical Distances: Separation Distance = (1 meter for O<sub>3</sub>, CO, SO<sub>2</sub>, NO<sub>2</sub>) and (2 meters for PM, Pb)

When probe is located on a rooftop, this separation distance is in reference to walls, parapets, or penthouses located on roof.

Are all probes at least 1 meter apart? Yes

Are all collocated low volume samplers between 1 to 4 meters apart? Yes

Are all collocated high volume samplers between 2 to 4 meters apart? N/A

Are all probes located in an area that is paved or has vegetative ground cover? Yes

Are all rooftop samplers located at least 2 meters away from any structure? Yes

Is there unrestricted air flow 270 degrees around the probe or sampler? Yes

# Site Pictures for Southwest Tennessee Community College (SWTCC) Near Road

**SWTCC (North)**



**SWTCC (Northeast)**



**SWTCC (East)**



**SWTCC (Southeast)**



# Site Pictures for Southwest Tennessee Community College (SWTCC) Near Road

**SWTCC (South)**



**SWTCC (Southwest)**



**SWTCC (West)**



**SWTCC (Northwest)**



**E. Edmund Orgill Park, Shelby County, TN**



Reporting Org. Name	Memphis/Shelby County Health Dept.
PQAO	673
Address	6855 Mudville Rd.
AQS ID	47-157-1004
County Name	Shelby
CBSA	32820
Latitude	35.161264
Longitude	-89.870646
Parameter Code	44201
Parameter Name	Ozone
Monitor Type	SLAMS
POC	1
Interval	1
Year	2023
Collection Frequency	Hourly
Method	087
FRM/FEM Monitoring Instrument	Teledyne Advanced Pollution Instrumentation, Inc. Model 400/400A/400E/T400
Analysis	Ultraviolet Absorption
Ref. Method ID	EQOA-0992-087
Monitor Objective Type	Population Exposure
Dominant Source	Area
Measurement Scale	Urban
Land Use Type	Agricultural
Location Setting	Rural
Date Site Established	19800201

**Site Background and Discussion**

The Edmund Orgill Park site is located in the City of Millington in Shelby County, Tennessee and currently supports monitoring for ozone.

This site was established in 1980 and is expected to operate during CY's 2023 and 2024.

## Site Evaluation Field Form

**Site Name: Edmund Orgill Park**

**AQS Site ID: 47-157-1004 Location: 6855 Mudville Rd. Date: 04/28/22 Evaluator: JL**

**Site Coordinates: Latitude 35.161264 Longitude -89.870646**

**Monitoring Scale: Agricultural**

Pollutant	Sampler/Probe Inlet Height (IH in m)	Inlet Location	Horizontal Distance (m)	Vertical Distance (m)	Pass/ Fail
O <sub>3</sub>	3.34 m	Side of building	21.21 m	10.94 m	Pass

Obstruction	Obstruction Height (OH)	Obstruction Distance (OD)	Dripline	Pass/Fail
Tree northwest of site	11.14 m	2 (11.14 – 3.34) = 15.6 m	21.1 m	Pass

Dripline should be >20 m from the dripline of tree(s) and must be 10 m from the dripline when the tree(s) act as an obstruction.  
 For Horizontal and Vertical Distances: Separation Distance = (1 meter for O<sub>3</sub>, CO, SO<sub>2</sub>, NO<sub>2</sub>) and (2 meters for PM, Pb)  
 When probe is located on a rooftop, this separation distance is in reference to walls, parapets, or penthouses located on roof.

Are all probes at least 1 meter apart? Yes

Are all collocated low volume samplers between 1 to 4 meters apart? N/A

Are all collocated high volume samplers between 2 to 4 meters apart? N/A

Are all probes located in an area that is paved or has vegetative ground cover? Yes

Are all rooftop samplers located at least 2 meters away from any structure? Yes

Is there unrestricted air flow 270 degrees around the probe or sampler? Yes

## Site Pictures for Edmund Orgill Park

**Edmund Orgill (North)**



**Edmund Orgill (Northeast)**



**Edmund Orgill (East)**



**Edmund Orgill (Southeast)**



## Site Pictures for Edmund Orgill Park

**Edmund Orgill (South)**



**Edmund Orgill (Southwest)**



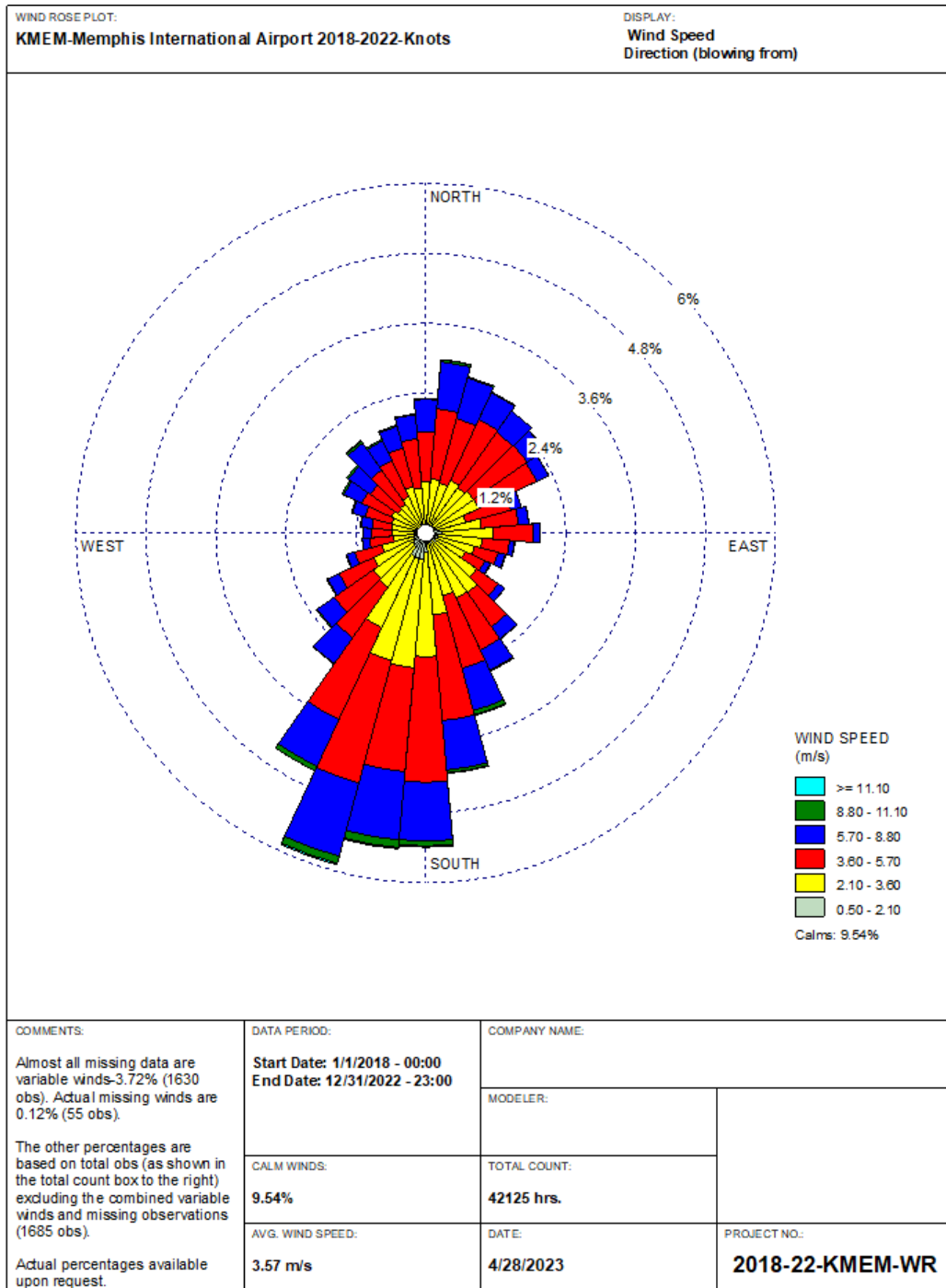
**Edmund Orgill (West)**



**Edmund Orgill (Northwest)**



## V. Shelby County Climatology and Geography



WRPLOT View - Lakes Environmental Software

**Wind Rose for Memphis, TN-MS-AR MSA**



# Shelby County Geography and Climatology

## Shelby County Geography

Shelby County, the largest county in area in Tennessee covers an area of 760.55 square miles or 486,752 acres (<https://www.census.gov/quickfacts/fact/table/shelbycountytennessee,US/PST045222>). The 2021 population estimate (July 1, 2021 as 2022 was unavailable) from the U.S. Census for Shelby County is 924,454 (<https://www.census.gov/quickfacts/fact/table/shelbycountytennessee,US/PST045222>). The estimated population density of Shelby County is 1222.5 people per square mile. The elevation ranges from 185 above mean sea level (MSL) along the islands in the Mississippi River in the southern portion of the county to about 416 feet above MSL in the rolling hills of the southeastern area of Shelby County. Bluffs that are located in the western area of the county near the Mississippi River are derived from the wind-driven buildup of silt, sand, and clay known as loess, and are approximately 250 feet above MSL. The central region of the county is located on an ancient alluvial plain, a mostly flat area consisting of several layers of silt, sand, gravel, and clay, approximately 300-320 feet above MSL. The eastern area of the county consists of gentle, rolling hills, approximately 340-400 feet above MSL. The largest city within Shelby County is Memphis with a population of 628,127 and a population density of 2131.8 per square mile. Other cities and towns within Shelby County include Millington (10,508); Bartlett (57,318); Lakeland (13,805); Arlington (14,448); Collierville (51,343); and Germantown (41,034).

All city populations and population density estimates were official U.S. Census estimates from 2021 and were obtained using the QuickFacts Table from <https://www.census.gov/quickfacts/fact/table/shelbycountytennessee/PST045222>. The 2022 estimates were unavailable at the time of this report.

## Shelby County Climatology

Like most of the Southeast U.S. and southern Mid-Atlantic states, Shelby County, TN falls within the humid subtropical climate zone (Cfa on the Köppen Climate Classification). This can be described as hot, humid summers with mild to cool winters. Using the latest 30-year climate data set (1991-2020) obtained by the National Climatic Data Center (**Note:** The new 1991-2020 climate data set showed warming temperatures and more precipitation (more rainfall, but less snowfall) when compared to the 1981-2010 climate data set), the normal conditions are as follows:

Coldest Month: January (avg max temp=50.9 degrees F; avg min temp=33.3 degrees F)

Warmest Month: July (avg max temp=91.9 degrees F; avg min temp=73.6 degrees F)

Yearly Precipitation Normal: 54.94 inches (52.24 inches of rainfall and 2.7 inches of snowfall)

Wettest Months: December and March-May (avg of 5.49, 5.74, 5.87 and 5.27, respectively)

Driest Months: August-September (avg of 3.37 and 3.03 inches, respectively)

Wind direction is most prevalent from the south to southwest (see wind rose data)

Most frontal activity occurs in the Spring and Autumn. Summer experiences lower humidity at the start of the season with higher humidity levels starting by early to mid-July as the Bermuda High pressure system pulls warm, moist air into the lower Mississippi Valley from the Gulf of Mexico. Localized thunderstorms are common in the afternoon. By September, the humidity begins to lower as the Bermuda high breaks down. Winters are usually mostly mild with periods of very cold air. Severe weather is most common in the Spring, but can occur any time of year.

## **VI. Local Programs Submittals of Ambient Monitoring Plan**

### **Memphis Air Monitoring Plan**

These documents are provided as submitted by the respective monitoring agency for use by the state in updating the overall ambient monitoring plan document.

- A. Memphis Air Monitoring Plan
  1. PM<sub>2.5</sub> Collocation at Shelby Farms NCore site
  2. PM<sub>2.5</sub> Collocation at Alabama Ave. site
  3. Continuous PM<sub>2.5</sub> FEM sampling
  4. PAMS at Shelby Farms NCore site
  
- B. Shelby County Air Pollution Active Sites 2023
  
- C. 2023 Ambient Monitor and Auxiliary Support Equipment Evaluation

## **A. Memphis Air Monitoring Plan**

### Shelby County Health Department Air Pollution Control Program

#### Network Review

2023

An assessment of the Shelby County Health Department's (SCHD) ambient air monitoring network has been conducted. The SCHD Air Monitoring Branch has evaluated each air monitoring site according to the requirements and provisions as required by the Code of Federal Regulations 40, Parts 50, 53, and 58 and have concluded that the number and locations of the monitors in our network comply with the CFR provisions. In some areas of the network, more monitors are operating than required. Therefore, the SCHD is forwarding the enclosed documents with the pertinent air monitoring site information so that the contents may be incorporated into the State of Tennessee's Monitoring Network plan to EPA.

Changes to our air monitoring network include the following:

#### **1. PM<sub>2.5</sub> Collocation at the Shelby Farms NCore station**

40 CFR 58.12 (d) (2) states that all FRMs at the NCore sites must minimally operate on a 1-in-3 day sampling frequency. This includes the collocated samplers. The SCHD AMB began the operation of a Teledyne T640x FEM sampler on January 1, 2021 at the Shelby Farms NCore station. A Thermo 2025i FRM sampler has operated on a 1-in 3-day sampling schedule on January 1, 2021 to meet collocation requirements.

#### **2. PM<sub>2.5</sub> Collocation at the Alabama Ave. station**

The SCHD AMB operates 2 FRM PM<sub>2.5</sub> Thermo 2025i samplers. The POC 1 sampler operates on a 1-in 3- day schedule and the POC 2 sampler operates on a 1- in 12- day schedule to meet collocation requirements. The POC 1 sampler began operating on January 1, 2017. The POC 2 collocated sampler began operating on January 1, 2021 when the collocated FRM sampler at Shelby Farms was replaced with a T640x. When funding becomes available, a T640x will be purchased and will replace the 2 PM<sub>2.5</sub> FRMs and the PM<sub>10</sub> FEM (TEOM) sampler.

#### **3. Continuous PM<sub>2.5</sub> FEM sampling**

The SCHD AMB continues to operate 3 FRM samplers in the network. The goal in the next couple of years is to replace the 1 FRM sampler at the Near Road site and replace it with a Teledyne T640x FEM sampler. Also, the 2 FRM samplers and 1 FEM PM<sub>10</sub> will be replaced with a Teledyne T640x sampler at the Alabama Ave. station.

#### **4. PAMS at the Shelby Farms NCore site**

Based on 40 CFR Part 58, Appendix D, State air monitoring agencies are required to begin making PAMS measurements at their NCore location(s) by June 1, 2019. An extension was granted and was effective on February 7, 2020 delaying the start date for PAMS monitoring to June 1, 2021. The SHCD began PAMS season by the June 1, 2021 deadline. The pollutants measured were true NO<sub>2</sub>, carbonyl, cloud mixing height (using a ceilometer) and the meteorological data ambient temperature, barometric pressure, relative humidity, wind direction and wind speed which are already measured at the Shelby Farms NCore station. The SCHD AMB was able to purchase and install the instruments needed to measure for solar radiation, UV radiation and precipitation prior to the start of the 2023 PAMS season.

### B. 2023 Shelby County Active Sites

Shelby County Health Department Active Sites	Pollutant	Monitor	AQS ID
416 Alabama	PM <sub>2.5</sub> (1 in 3 day) PM <sub>2.5</sub> (1 in 12 day)  PM <sub>10</sub> continuous	Thermo Environmental 2025I Sequential TEOM 1405	47-157-0024
6855 Mudville (Edmund Orgill Park)	O <sub>3</sub> continuous	Teledyne API	47-157-1004
1330 Frayser	O <sub>3</sub> continuous	Teledyne API	47-157-0021
6388 Haley Rd.	CO (trace) continuous SO <sub>2</sub> (trace) continuous NO <sub>y</sub> (trace) continuous O <sub>3</sub> continuous PM <sub>2.5</sub> (1 in 3 day) PM <sub>2.5</sub> , PM <sub>10</sub> , PM <sub>10-2.5</sub> continuous PM <sub>2.5</sub> Speciation (1 in 3 day) Carbon (1 in 3 day) Wind Speed Wind Direction Ambient Temperature Relative Humidity Barometric Pressure NO <sub>2</sub> continuous Carbonyl (1 in 3) autoGC (continuous)	Teledyne API Teledyne API Teledyne API Teledyne API R&P 2025 PM 2.5 Teledyne API  Met One Super SASS  URG 3000 Met One Sonic Met One Sonic RM Young RM Young Climatronics Teledyne API ATEC Chromatotec (CAS)	47-157-0075
5767 Macon Cv.	CO Continuous NO <sub>2</sub> Continuous PM <sub>2.5</sub> (1 in 3 day)	Teledyne API Teledyne API  Thermo Environmental 2025I Sequential	47-157-0100

### C. 2023 Ambient Monitor and Auxiliary Support Equipment Evaluation

<b>Site Location: 1330 Frayser Blvd.</b>			
Make	Model	Serial Number	Condition
ESC	8832	A1571	Good
Teledyne Advanced Pollution Instrumentation	T400	1304	Good
Teledyne Advanced Pollution Instrumentation	T703	806	Good
<b>Site Location: 416 Alabama</b>			
Make	Model	Serial Number	Condition
ESC	8816	1264	Poor
ESC	8832	A1567	Good
ESC	8816	3458	Good
ESC	8816	1267	Poor
General Atomics (HiOQ Environmental)	Radnet	793304	Good
Graesby GMW	PM 10	2375	Good
Met One Instruments	SASS	Control Box B-1480	Poor
Met One Instruments	SASS	Pump Box B2919	Poor
Met One Instruments	SASS	Temperature Sensor	Good
Thermo Environmental Instruments	2025I	20737	Good
Thermo Environmental Instruments	2025	2025B219080607	Good
Thermo Environmental Instruments	1405	1405A223701302	Good
URG	3000N	Module C 3N-B0847	Good
URG	3000N	Stand (Pump) 3N-B0630	Poor
URG	3000N	Controller 3N-B0690	Good
URG	3000N Stand (Pump )	3N-B0630	Good
<b>Site Location: 6388 Haley Rd.</b>			
Make	Model	Serial Number	Condition
Chromatotec	GC866 / A23022	28970620	Good
Chromatotec	AirmoC AL 922	59030620	Good
Chromatotec	GC866 / A12000	58940620	Good
Chromatotec Hydroxichrom	916	39000520	Good
Climatronics Omega	100093	Temperature Sensor/J2850C	Poor
Climatronics	102663	BP Sensor/43970	Good
ESC	8832	A-1578	Good
ESC	8832	A-1568	Good
ESC	8832	A3763K	Good
Kipp and Zonen	BD300	051518	Poor
Met One Instruments	50.5 Sonic Wind Sensor		Poor

Met One Instruments	SSASS	Control Box G9204	Good
Met One Instruments	SSASS	Pump Box K17956	Good
Met One Instruments	SASS	Sample Head K17985	Good
RM Young (Compacted Aspirated Radiation Shield)	43502		Good
RM Young (Wind Direction and Wind Speed)	05305	WM174800	Good
RM Young ( Relative Humidity and Temperature)	41382V	174800	Good
Rupprecht & Pataschnick	1400A	1400AB231030006	Poor
Rupprecht & Pataschnick	2025	20921	Good
Rupprecht & Pataschnick	2025	21802	Good
Sierra Instruments (Lead , HiVol)		02409620250	Good
Teledyne Advanced Pollution Instrumentation	400E	2664	Poor
Teledyne Advanced Pollution Instrumentation	T400	3521	Poor
Teledyne Advanced Pollution Instrumentation	T400	0631	Good
Teledyne Advanced Pollution Instrumentation	T703	913	Good
Teledyne Advanced Pollution Instrumentation	701H	80	Poor
Teledyne Advanced Pollution Instrumentation	100EU	135	Good
Teledyne Advanced Pollution Instrumentation	T100U	403	Poor
Teledyne Advanced Pollution Instrumentation	300EU	246	Poor
Teledyne Advanced Pollution Instrumentation	T200U	209	Good
Teledyne Advanced Pollution Instrumentation	700EU	88	Poor
Teledyne Advanced Pollution Instrumentation	701H	1621	Good
Teledyne Advanced Pollution Instrumentation	T701H	845	Poor
Teledyne Advanced Pollution Instrumentation	T700U	673	Good
Teledyne Advanced Pollution Instrumentation	501Y	104	Good
Teledyne Advanced Pollution Instrumentation	T640x	960	Good
Teledyne Advanced Pollution Instrumentation	T500U	322	Good
Thermo Environmental Instruments	2025I	20353	Good
Thermo Environmental Instruments	2025I	20739	Good
Thermo Environmental Instruments	2025B	21908	Good
URG	3000N	Module C 3N- B0794	Good
URG	3000N	Controller 3N- B0742	Good
URG	3000N	Stand (Pump) 3N- B0592	Good
Vaisala		RH sensor/T25685	Good
Vaisala	CL51	T1120262	Good
Teledyne Advanced Pollution Instrumentation	T700U	642	Good
Teledyne Advanced Pollution Instrumentation	T300U	174	Good
Teledyne Advanced Pollution Instrumentation	T300U	651	Good



<b>Site Location: 5767 Macon Cv.</b>			
<b>Make</b>	<b>Model</b>	<b>Serial Number</b>	<b>Condition</b>
ESC	8832	A4830K	Good
Teledyne Advanced Pollution Instrumentation	701H	1622	Good
Teledyne Advanced Pollution Instrumentation	T640	200	Good
Teledyne Advanced Pollution Instrumentation	T200	6554	Good
Teledyne Advanced Pollution Instrumentation	T700	1800	Good
Teledyne Advanced Pollution Instrumentation	T300	6025	Good
Thermo Environmental Instruments	2025I	2025IW207401501	Good
<b>Site Location: 6855 Mudville Rd.</b>			
<b>Make</b>	<b>Model</b>	<b>Serial Number</b>	<b>Condition</b>
ESC	8832	A4002K	Poor
Teledyne Advanced Pollution Instrumentation	T400	5882	Good
Teledyne Advanced Pollution Instrumentation	T703	235	Good
<b>Site Location: 1826 Sycamore View (Lab)</b>			
<b>Make</b>	<b>Model</b>	<b>Serial Number</b>	<b>Condition</b>
Advance Pollution Instrumentation	701	1084	Poor
Advance Pollution Instrumentation	401	188	Good
Advance Pollution Instrumentation	400	733	Good
Advance Pollution Instrumentation	700	404	Poor
Advance Pollution Instrumentation	401	227	Poor
Advance Pollution Instrumentation	400A	650	Poor
Advance Pollution Instrumentation	701	644	Poor
Advance Pollution Instrumentation	401	253-S	Poor
Advance Pollution Instrumentation	400A	459	Poor
Boekel	Dricycler	124046600	Good
Climatronics	102663-2	BP Sensor / R23352	Good
Climatronics	102874	Sonic / T12878	Poor
Climatronics	100093	Temp Sensor / R19750	Poor
Dresser Roots Meter	5M125	8622376	Good
Envionics	6103	3445	Poor
ESC	8832	A1569	Good
ESC	8872	795	Good
ESC	8816	1268	Good
Rupprecht & Pataschnick	2025	2025A209179811	Poor
Sartorius	Balance	40100003	Good
Teledyne Advanced Pollution Instrumentation	T703	169	Poor
Teledyne Advanced Pollution Instrumentation	M200EU	184	Poor
Teledyne Advanced Pollution Instrumentation	T400	1779	Good
Teledyne Advanced Pollution Instrumentation	703E	297	Poor
Teledyne Advanced Pollution Instrumentation	700EU	88	Poor
Teledyne Advanced Pollution Instrumentation	T300	1539	Poor

Teledyne Advanced Pollution Instrumentation	T400	312	Good
Teledyne Advanced Pollution Instrumentation	701H	809	Poor
Teledyne Advanced Pollution Instrumentation	701H	1622	Good
Teledyne Advanced Pollution Instrumentation	701H	113	Good
Teledyne Advanced Pollution Instrumentation	T750H	55	Good
Teledyne Advanced Pollution Instrumentation	501Y	145	Poor
Teledyne Advanced Pollution Instrumentation	751H	84	Good
Teledyne Advanced Pollution Instrumentation	T700U	206	Poor
Teledyne Advanced Pollution Instrumentation	300E	700	Poor
Teledyne Advanced Pollution Instrumentation	T200U	182	Poor
Teledyne Advanced Pollution Instrumentation	T400	1138	Poor
Troemner Class I Weights		38380	Good
Troemner Class I Weights		A125	Good
VWR Oven	89511-410	41747908	Good
Vaisala	102802	RH Sensor / T16788	Poor

## **VII. Appendix**

Cover Letter for Memorandum of Agreement for Memphis, TN-MS-AR

Memorandum of Agreement for Memphis, TN-MS-AR



LEE HARRIS  
MAYOR

# SHELBY COUNTY HEALTH DEPARTMENT



Public Health  
Prevent. Promote. Protect.  
Shelby County Health Department

MICHELLE A. TAYLOR, MD DRPH, MPA  
HEALTH DIRECTOR & OFFICER

May 5, 2023

Ms. Michelle Walker Owenby, Air Director  
Tennessee Department of Environment and Conservation Air Pollution Control Division  
William R. Snodgrass Tennessee Tower  
312 Rosa L. Parks Ave., 15th Floor  
Nashville, TN 37243-1531

Ms. Melissa Fortenberry, Air Division Chief  
Mississippi Department of Environmental Quality  
Office of Pollution Control  
Air Division  
P.O. Box 2261  
Jackson, MS 39201

Mr. David Witherow, P.E., Associate Director  
Office of Air Quality  
Arkansas Department of Energy and Environment  
5301 Northshore Dr.  
North Little Rock, AR 72118-5317

Dear All,

In accordance with the provisions of the Memorandum of Agreement (MOA) signed in May and June of 2008 between the Shelby County Health Department (SCHD), Mississippi Department of Environmental Quality (MDEQ) and the Arkansas Department of Energy and Environment - Division of Environmental Quality (DEQ), this letter serves as a notification that each respective agency in the MOA have been contacted by the SCHD and no changes have been made in the current monitoring network. With this MOA, all agencies are meeting EPA monitoring requirements.

If changes to the network will or will not be made in the future, please notify the respective agencies of your intent.

If you have any questions, please call me at (901) 222-9193.

Sincerely,

Kasia Smith-Alexander  
Bureau Director, Environmental Health Services  
Shelby County Health Department

Mission

*To promote, protect and improve the health of ALL in Shelby County.*

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814 Jefferson Avenue ♦ Memphis, TN 38105 ♦ 901 222-9000 ♦ [www.shelbytnhealth.com](http://www.shelbytnhealth.com)

**MEMORANDUM OF AGREEMENT  
ON AIR QUALITY MONITORING FOR CRITERIA  
POLLUTANTS FOR  
THE MEMPHIS, TN- MS- AR  
METROPOLITAN STATISTICAL AREA (MSA)**

Participating Agencies:

Shelby County Health Department (SCHD)  
Air Pollution Control Program

Mississippi Department of Environmental Quality (MDEQ)  
Office of Pollution Control, Air Division

Arkansas Department of Energy and Environment  
Division of Environmental Quality (DEQ)

**PURPOSE / OBJECTIVE / GOALS**

The purpose of this Memorandum of Agreement (MOA) is to inform the entities of the Memphis, Tennessee-Mississippi-Arkansas Metropolitan Statistical Area of monitoring network changes. The MOA between SCHD, MDEQ, and DEQ is to collectively meet United States Environmental Protection Agency (EPA) minimum monitoring requirements for particles of an aerodynamic diameter of 10 micrometers and less (PM<sub>2.5</sub>), and ozone; as well as other criteria pollutants air quality monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all parties. This MOA will formalize and reaffirm the collective agreement in order to provide adequate criteria pollutant monitoring for the Memphis, TN-MS-AR MSA as required by 40 CFR 58 Appendix D, Section 2, (e).

PM2.5 MSA monitoring network include:

<u>Count</u> )I	<u>Federal Referenced Method</u> <u>PM<sub>2.5</sub></u>	<u>Federal Equivalent Method</u> <u>PM<sub>2.5</sub></u>	<u>Continuous</u> <u>PM<sub>2.5</sub></u>	<u>Sociation</u> <u>PM<sub>2.5</sub></u>	<u>Collocated</u> <u>PM<sub>2.5</sub></u>
Shelby County, TN <b>SCHD</b>	4 (includes 2 at Alabama, 1 at NCore, and 1 at the Near Road station)	1		1	2
Crittenden County, AR <b>DEQ</b>	1		1		
DeSoto County, MS <b>MDEQ</b>		1			

Criteria Air Pollutant MSA monitoring network include:

<u>Count</u> )I	<u>PM<sub>10</sub></u>	<u>PM<sub>10-2.5</sub></u>	<u>?</u>	<u>NO<sub>x</sub>/NO<sub>2</sub>/NO/NO<sub>y</sub></u>	<u>CO</u>	<u>SO<sub>2</sub></u>
Shelby County, TN <b>SCHD</b>	2 (TEOM at Alabama Ave. and T640x at NCore)	1	3	3 (includes 1 NO <sub>x</sub> /NO <sub>2</sub> at the Near Road Station, 1 NO/NO <sub>y</sub> at NCore/PAMS, 1 true NO <sub>2</sub> at NCore/PAMS)	2 (includes 1 trace at NCore and 1 at the Near Road Station)	1 (trace at NCore)
Crittenden County, AR <b>DEQ</b>			1	1		
DeSoto County, MS <b>MDEQ</b>			1			

## **RESPONSIBILITIES / ACTIONS**

Each of the parties to this Agreement is responsible for ensuring that its obligations under the MOA are met. As conditions warrant, the affected agencies may conduct telephone conference calls, meetings, or other communications to discuss monitoring activities for the MSA. Each affected agency shall inform the other affected agencies via telephone or email of any monitoring changes occurring within its jurisdiction of the MSA at its earliest convenience, after learning of the need for the change or making the changes. Such unforeseen changes may include evictions from monitoring sites, destruction of monitoring sites due to natural disasters, or any occurrences that result in an extended (greater than one quarter) or permanent change in the monitoring network.

## **LIMITATIONS**

- All commitments made in this MOA are subject to the availability of appropriated funds and each agency's budget priorities. Nothing in this MOA obligates SCHD, MDEQ, or DEQ to expend appropriations or to enter into any contract, assistance agreement, interagency agreement or other financial obligation.
- This MOA is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between parties to this agreement will be handled in accordance with applicable laws, regulations, and procedures, and will be subject to separate agreements that will be affected in writing by representatives of the parties.
- This MOA does not create any right or benefit enforceable by law or equity against SCHD, MDEQ, or DEQ, their officers or employees, or any other person. This MOA does not apply to any entity outside SCHD, MDEQ, or DEQ.
- No proprietary information or intellectual property is anticipated to arise out of this MOA.

## **TERMINATION**

This Memorandum of Agreement may be revised upon the mutual consent of SCHD, MDEQ and DEQ. Each party reserves the right to terminate this MOA. A thirty (30) day written notice must be given prior to the date of termination.