CHATTANOOGA-HAMILTON COUNTY AIR POLLUTION CONTROL NETWORK REVIEW 2017

Site Evaluation 2017

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Table of Contents

Table of Figures

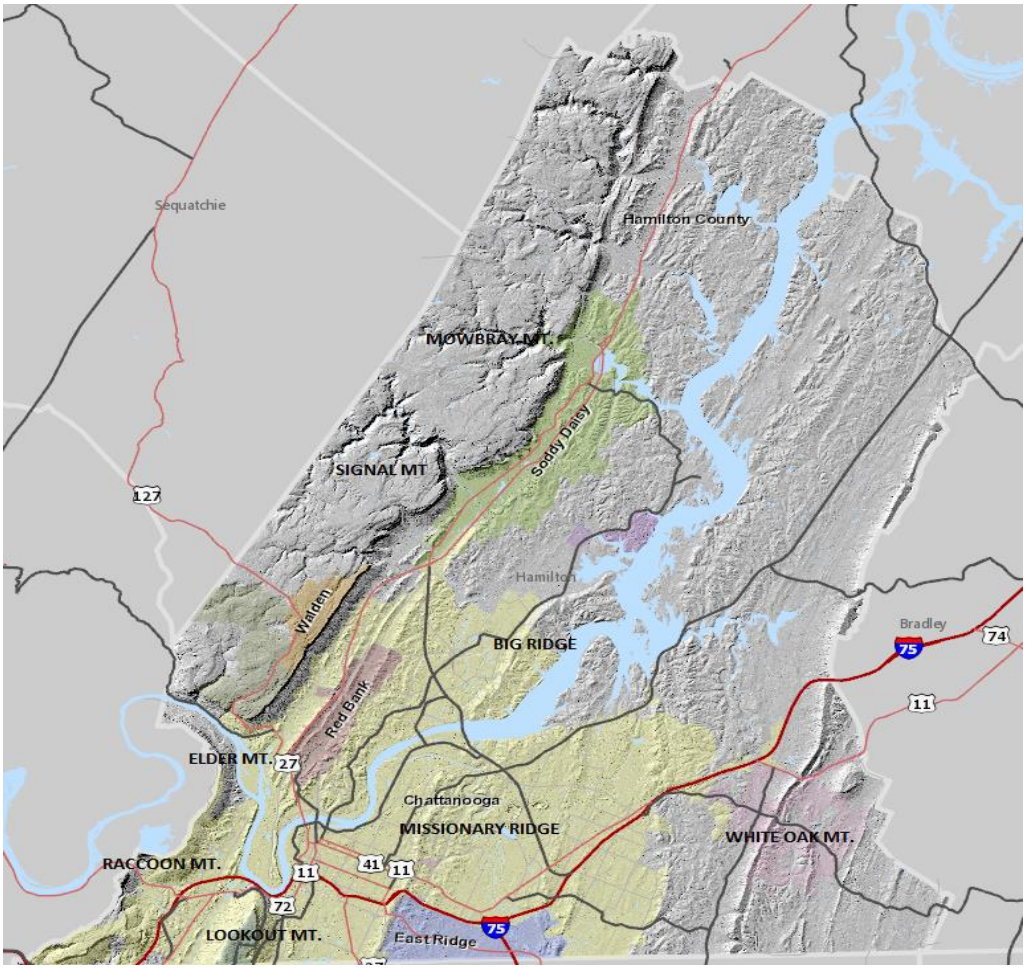
Introduction

Hamilton County, Tennessee, contains the City of Chattanooga and the municipalities of Collegedale; Soddy Daisy; Signal Mountain; Red Bank; East Ridge; Lookout Mountain, Tennessee; Walden, and Lakesite. 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 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 pollution in the valley.

Figure 1



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 in 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.

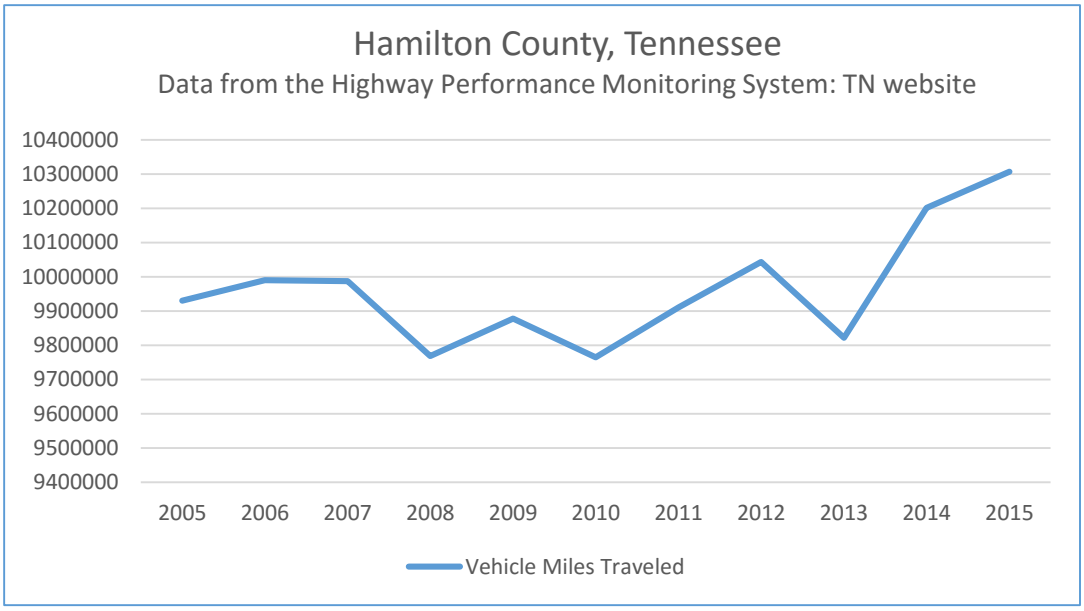
Traffic

In 1987 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.

The Interstate 75 corridor, a major north-south route for commercial transport, runs through Chattanooga and connects with I24 near East Ridge. On either side of the I75-I24 split are the highest traffic counts in Hamilton County. The split is on TDOT's list for future major rework to ease some of the traffic congestion as the split is a traffic bottleneck. Easing congestion should reduce vehicle pollution in that area.

Vehicle Miles Traveled

Figure 2



Population

The population estimate of Hamilton County for 2016 is 323,127,513 on the US Census Bureau website, and the 2016 population estimate of the City of Chattanooga is 176,588.

The two areas of the highest population density in Hamilton County are in the municipality of East Ridge and downtown in the University of Tennessee area. Both areas of the highest density contain particulate monitoring sites for $PM_{2.5}$. The University density is seasonal as the density decreases in the summer months. The population density of East Ridge is (2010 census) 2,534 persons per square mile whereas the City of Chattanooga (2010) has a population density of 1,223 persons per square mile. East Ridge,

therefore, is more than twice as dense as the City of Chattanooga. The population density of Hamilton County (2010) is 621 per square mile.

The Hamilton County racial demographics for predominant ethnicities for 2015 (most current available from US Census Bureau) of Hamilton County are White only (not Hispanic or Latino) 61.6%; Black only 13.3%; Asian only 5.6%; and Hispanic only 17.6%. The racial demographics of the City of Chattanooga for predominant ethnicities are based on the 2010 Census: White only (not Hispanic or Latino) 55.9%, Black only 34.9%, Asian only 2%, Hispanic only 5.5%. The City population is estimated to have increased 3.7% from April 1, 2010, to July 1, 2015.

The Small Area Income and Poverty Estimates (SAIPE) from the US Census Bureau website estimate the poverty in Hamilton County for 2015 (latest estimate available) as 15.2%. The poverty estimate for the City of Chattanooga is 22.6% based on the 2011-2015 American Community Survey 5-Year Profiles.

The Chattanooga-Hamilton County CMSA is composed of Hamilton, Marion, and Sequatchie counties in Tennessee and Catoosa, Dade, and Walker Counties in Georgia. The US Census Bureau's 2016 population estimate for the MSA is 551,632 with an estimated increase of 4,625 over the estimate for 2015. Hamilton is the most urbanized county in the CMSA. The other counties are more rural.

Weather

Hamilton County tends to have frequent temperature inversions. Wind direction is addressed in the State of Tennessee submittal that accompanies this document.

Figure 3

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

Network Review 2017

PM_{10} Site Requirement Waiver Requested

The Chattanooga-Hamilton County Air Pollution Control Bureau (the Bureau) petitioned EPA on August 28, 2014, to delete the collocated PM_{10} site operating on a 6-day monitoring schedule at 3300 South Broad Street (470650006). 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 requirements. Chattanooga-Hamilton County, therefore, is renewing the request for a waiver of the PM_{10} monitoring requirement. A copy of EPA's Air Monitoring Plan 2014 response letter to Barry Stephens is attached as Appendix A.

Data Comparison to the NAAQS

40 CFR Part 58 requires the Annual Monitoring Network Review to identify sites that are suitable and sites that are not suitable for comparison against the annual $PM_{2.5}$ NAAQS. All four Chattanooga-Hamilton County monitoring sites produce data that are suitable to compare against the National Ambient Air Quality Standards. All sites are meeting siting requirements, and all data is produced by Federal Equivalent or Federal Reference Methods except for $PM_{2.5}$ continuous monitoring that is used for AQI only. All sites' data meet data completion requirements and quality control requirements.

Purchase of T640 for $PM_{2.5}$ AQI

The Bureau purchased a Teledyne T640 light scattering instrument in December of 2016 for $PM_{2.5}$ monitoring for Air Quality Index (AQI) only. It is operated as a Special Purpose Monitor for $PM_{2.5}$. It monitors PM_{10} data, but the data is not Federal Reference or Federal Equivalent. It is being run in conjunction with a 1400ab TEOM. The TEOM is to be decommissioned as the site is reworked.

Figure 4

Chattanooga-Hamilton County Active Sites	Pollutant	Monitor	AQS #
911 Siskin Drive	$PM_{2.5}$ Collocated (3-day) $PM_{2.5}$ Continuous TEOM $PM_{2.5}$ (FRM/SPM) T640 and PM_{10} (not FRM) T640	(2) R & P 2025 Seq. TEOM 1400AB Teledyne T640	470654002 CORE $PM_{2.5}$
1517 Tombras Avenue East Ridge City Hall	$PM_{2.5}$ (Daily collocation from1/1/2009-1/17/2010) 3-day monitoring began 1/20/2010)	R & P 2025 Seq.	470650031
618 Sequoyah Road Soddy-Daisy High School	Ozone Continuous Ozone Calibrator	TECO 49i TECO 49iPS	470651011
3018 Hickory Valley Road Eastside Utility District Physical location is end of Reservoir Road (Private Drive)	Ozone Continuous Ozone Calibrator	TECO 49i TECO 49iPS	470654003

Equipment Evaluation 2017

Figure 5

Equipment	Location	Serial Number	Condition
PM_{10-} Stored	0006	1847- decommissioned 1/2015	Good
PM_{10-} Stored	0006	1845-decommissioned 1/2015	Good
$PM_{2.5}$	4002	20781 with VSCC	Good
$PM_{2.5}$	4002	20775 with VSCC	Good
$PM_{2.5}$	0031	20772 with VSCC	Good
$PM_{2.5}$	Spare	20774-decommissioned 12/31/2015	Good
$PM_{2.5}$	Spare	90709	Poor parts only
$PM_{2.5}$ TEOM	Spare	1400A 24452 Eq Unit SES1B 203940211 Sensor Unit 140AB 244520302	Good
$PM_{2.5}$ TEOM	4002	1400 AB 244530302 Sensor Unit 24454	Good
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	Excellent
Datalogger	Spare	ESC 8816	Good
Datalogger	4003	ESC 8816	Good
Datalogger	4002	ESC 8832 AO994	Good
Datalogger	Spare	ESC 8832 A 4010 K	Good
Datalogger	To be installed 4003	ESC/Agilaire 8872	Excellent
Ozone Audit Monitor	1011	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	Good
8 X 14 Shelter	4003	EKTO 8814 SN 3473-1	Good
8 X 14 Shelter	4002	EKTO 8814 SN 3473-2	Poor

Changes to Established Sites

The Bureau plans to surplus the shelter from the Siskin Drive 470654002 site because of its poor condition and place a platform there instead. This project is expected to be completed in mid-2017. When the equipment is installed on the deck, the TEOM will be taken out of service.

Quotes have been obtained to put at least the two ozone sites on fiber optics for a continuous connection. The Bureau is working with the City of Chattanooga IT Department for the project, and the Bureau expects it to be completed by June.

The chart recorders have been taken out of service entirely. In their place is an additional data logger, a spare 8816, at Eastside Utility (4003), and Agilaire's AV Trends is running on a PC at Soddy Daisy High School (1011) to serve as a second logger. AV Trends has been purchased for Eastside Utility and will be placed in service when an 8872 is functioning at that site. The site currently has an 8816 which does not have an IP port.

The Bureau began using Very Sharp Cut Cyclones (VSCCs) for all $PM_{2.5}$ FRMs on January 1, 2017. The Bureau is no longer using WINs Impactors.

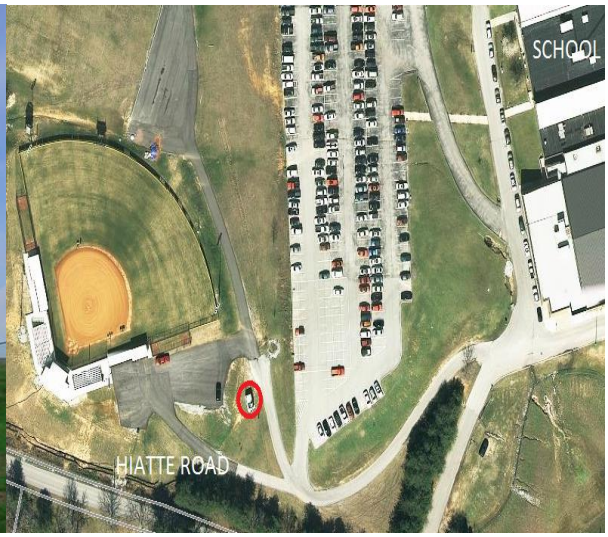
Possible Site Changes for 2017

The Bureau is still searching for an appropriate location for a new Eastside Utility site within a mile radius of the current site. No appropriate sites have been found. The Bureau may consider locating outside the one mile radius. Chattanooga-Hamilton County will submit a proposal for EPA approval if an appropriate location is found.

Site Evaluations for 2017

EPA has requested that site evaluations be included in the Network Review for 2017. All directional pictures were taken on April 20, 2017.

SODDY DAISY HIGH SCHOOL



Rep Org Name	CHATTANOOGA HAMILTON COUNTY AIR POLLUTION CONTROL BUREAU
PQAO	0170
Address	SODDY DAISY HIGH SCHOOL 618 SEQUOYAH ACCESS ROAD
AQS ID	470651011 (FORMERLY 0032 for $PM_{2.5}$)
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	2017
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
Source	AREA
Meas. Scale	NEIGHBORHOOD
Land Use Type	COMMERCIAL
Location Setting	RURAL
Elevation	930 FT ABOVE SEA LEVEL
Closest Met Site	CHATTANOOGA METROPOLITAN AIRPORT 1001 AIRPORT RD
Date Site Established	8/01/1978 MOVED TO SDHS 2/1/200

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 $PM_{2.5}$ monitor was originally located at the Sheriff's Annex at 6233 Dayton Boulevard (AQS 470650032) as a Special Purpose Monitor. The monitor was moved to the roof of the new shelter 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 submitted a letter to the Regional Administrator dated May 11, 2015, requesting to delete the Special Purpose $PM_{2.5}$ monitor. It was deleted December 31, 2015.

Soddy Daisy High School, 618 Sequoyah Road 470651011		
Street Name	**Traffic Counts**	**Distance**
Sequoyah Road- in front of the school	11,195 2015 TDOT	.28 miles, 446 meters
Hyatte Road- behind the site	2,005 (Lovell Road- intersects with Hyatte) 2015 TDOT	.02 mile, 39.7 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	**Obstructions**	**Height (m)**	**Distance (m)**
North	tree, tree	7.6 m, 10.7 m	25.4 m, 46.7 m
South	Tree Row	15.8 m	28.5 m
East	Tree Row	15.8 m	73.04 m
West	Field House	2 story-7.3 m	74.2 m
Probe		4.2 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

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-470651011

West

Northwest

EASTSIDE UTILITY

Rep Org Name	CHATTANOOGA HAMILTON COUNTY AIR POLLUTION CONTROL BUREAU
PQAO	0170
Address	RESERVOIR RD (PRIVATE DRIVE), UTILITY OFFICE ADDRESS: 3018 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	2017
Collection Frequency	HOURLY
Method	047
FRM/FEM	THERMO ENVIRON. 49i
Analysis	UV PHOTOMETRIC
Ref Mtd ID	EQOA-0880-047
Monitor Objective	TYPICAL CONCENTRATIONS
Dominant Source	AREA
Measurement Scale	URBAN
Land Use Type	INDUSTRIAL
Location Setting	URBAN AND CENTER CITY
Elevation	940 FT ABOVE SEA LEVEL
Closest Meteorological Site	CHATTANOOGA METROPOLITAN AIRPORT, 1001 AIRPORT ROAD
Date Site Established	6/13/1979 Moved from 0028- 2/2004 for 3/1/2004 season

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 from 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 Utility, a high security area, on the top of a hill on VAAP property 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.

Eastside Utility, 3018 Hickory Valley Road 470654003	
Street Names	**Traffic Counts: Average Per Day**
Highway 58	27,605 2015 TDOT
Hickory Valley Road	570 2015 TDOT
Reservoir Road – private drive to Eastside Water Utility	3 or 4 vehicles a day and a few trucks as the county is dumping dirt in a hole on the hill
Interstate 75	73,997 2015 TDOT
Highway 153	71,607 2015 TDOT

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	Obstructions	Height (m)	Distance (m)
North	None		
South	Building- One story	1 story	12.6 m
East	None		
West	SW- Building Tree behind building	2 story: top of gable 12.2 m	20.7 m 29.0 m
Probe		4.2 m	
Site is at the top of a hill			

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 controlled by the military that once housed nitric acid and sulfuric acid plants. About 1,000 acres are developed to the southeast of this monitoring site as a commercial/ industrial area around a 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	

Eastside Utility -470654003

North

Northeast

Eastside Utility 470654003

East

Southeast, South, and Southwest directional pictures have been removed to preserve security.

West

Eastside Utility 470654003

Northwest

SISKIN DRIVE/ UT Chattanooga

Rep Org Name	CHATTANOOGA-HAMILTON CO. 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	88501	88501
Parameter	$PM_{2.5}$ COLLOCATED	$PM_{2.5}$ CONTINUOUS	PM2.5 CONTINUOUS
Monitor	FRM	SPM	SPM/AQI
POC	1 2	3	1
Int	7	1	1
Year	2017	2017	2017
Coll. Freq.	3-DAY	HOURLY	HOURLY
Method	145- VSCC	716	236
FRM/FEM	R&P 2025 SEQ.	TEOM 1400ab	T640
Analysis	GRAVAMETRIC/ LAB IML	GRAV/50 °C	LT SCATTER
Ref ID	RFPS 0498-145	NOT FRM/FEM	SPM
Objective	POPULATION	POPULATION	POPULATION
Source	AREA	AREA	AREA
Scale	URBAN	URBAN	URBAN
Land Use	COMMERCIAL	COMMERCIAL	COMMERCIAL
Setting	URBAN/ CENTER CITY	URBAN/ CENTER CITY	URBAN/ CENTER CITY
Elevation	720 FT ABOVE SEA LEVEL		
Closest Met Site	CHATTANOOGA METROPOLITAN AIRPORT 1001 AIRPORT ROAD		
Date Estab.	1/1/1999	3/15/2004	2/16/2017

The Siskin Drive site was initially established January 1, 1999, as a CORE $PM_{2.5}$ 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 5TH Street, about early 2000; moved to a temporary site behind the University Administration Building at 400 Palmetto Street in late 2003; then to a new shelter at the current site March 15, 2004, at 911 Siskin Drive. Met One Speciation was added December 1, 2001; a continuous $PM_{2.5}$ monitor was added March 26, 2004; and a URG3000 was added October 1, 2009. The continuous $PM_{2.5}$ monitor 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. EPA defunded the Met One speciation and the URG3000 monitors in January of 2015, and speciation monitoring ceased. The T640 was added February 16, 2017, as a Special Purpose Monitor. The TEOM will be decommissioned in 2017. FRM monitors were converted from WINS to VSCCs January 1, 2017.

911 Siskin Drive (Formerly UT Chattanooga) 470654002	
Street Names	**Traffic Counts**
Siskin Drive	No counts: side road
Third Street	14,550 2015 TDOT
Riverside Drive/Amnicola Highway	31,524 2015 TDOT

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	Nursing Home (and Rehabilitation Facility east side of the nursing home)
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 St. Barnabas Nursing Home

Directions	**Obstructions**	**Height (m)**	**Distance (m)**
North	NE-Tree line NW-Tree in Utility Enclosure		33.5 m 30.5 m
South	SW-Tree	9.1 m Shelter is on incline Top of tree is not much higher than probe	11.7 m
East			
West			
Intakes POCS 1 & 2		(1) 4.9 m (2) 5.2 m	

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- Nursing Home	Hill
West	Utility transformer Enclosure	Hill

Siskin Drive-470654002

North

Northeast

Siskin Drive-470654002

East

Southeast

Siskin Drive-470654002

South

Southwest

Siskin Drive 470654002

West

Northwest

East Ridge City Hall-Tombras Avenue

Rep Org name	CHATTANOOGA HAMILTON COUNTY AIR POLLUTION CONTROL BUREAU
PQAO	0170
Address	1517 TOMBRAS AVENUE, EAST RIDGE
AQSID	470650031
County Name	HAMILTON
CBSA	CHATTANOOGA/ NORTH GEORGIA
Lat	34.99438
Lon	-85.24293
Parameter Code	88101
Parameter Name	$PM_{2.5}$
Monitor Type	SLAMS
POC	1
Int.	7
Year	2017
Collection Frequency	3 DAY
Method	145- VSCC
FRM/FEM instrument	R & P 2025 SEQ
Analysis	GRAVIMETRIC –LAB: IML
Ref Mtd ID	RFPS-0498-118
Monitor Objective	POPULATION EXPOSURE
Dominant Source	AREA
Measurement Scale	NEIGHBORHOOD
Land Use Type	COMMERCIAL
Location Setting	URBAN AND CENTER CITY
Elevation	720 FT ABOVE SEA LEVEL
Closest Meteorological Site	CHATTANOOGA METROPOLITAN AIRPORT 1001 AIRPORT ROAD
Date Site Established	5/6/1999, MOVED 11/20/2007 TO CITY HALL

The $PM_{2.5}$ site was originally established 5/6/1999 on the roof of the East Ridge Post Office, 1510 Maxwell Road, in the municipality of East Ridge in South Hamilton County near the Georgia border. It was moved to a temporary location behind the East Ridge City Hall on November 20, 2007. It was moved to a permanent location on the same property about 110 feet north on January 1, 2009. This site is roughly 3.5 miles from the Maple Street, North Georgia site, operated by the State of Georgia. The monitor was converted from WINS to VSCC on January 1, 2017.

1517 Tombras Avenue (Formerly Maxwell Road) 470650031		
Street Name	Traffic Counts	Approximate Distance
Tombras Avenue	About 4,442 (Bennett Road) 2015 TDOT	.06 mile or 100 meters
Ringgold Road	18,210 2015 TDOT	.17 mile or 269 meters

Direction	Predominant Land Use (Industry, Residential, Commercial or Agricultural)
North	East Ridge Elementary School
South	Residential
East	East Ridge City Hall, beyond City Hall is residential
West	Residential – municipality has highest population density in Hamilton County

Directions	Obstructions	Height (m)	Distance (m)
North	NW-Row –dead tree closest live tree	12.0 m 12.1 m	20.2 m 22.1 m
South	SE- Dead tree SE-3 Trees S-Tree line	3.7 m 15.2 m	12.5 m 25.3 m (closest)
East	One story building	3.7 m	14.9 m
West	SW-Tree line	15.2m	25.3 m
Intake		2.3 m	

Directions	Topographic Features (hills, valleys, rivers)	General Terrain (flat, rolling, rough)
North	Flat	Flat
South	Flat	Flat
East	Flat	Flat
West	Flat	Flat

East Ridge City Hall -470650031

North

Northeast

East Ridge City Hall- 470650031

East

Southeast

East Ridge City Hall -470650031

South

Southwest

East Ridge City Hall- 470650031

West

Northwest

Appendix A

EPA's Permission to Delete PM_{10} Site

Response Letter to Annual Network Plan of 2014

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

JAN 13 2015

Mr. Barry R. Stephens, PE
Director
Division of Air Pollution Control
Tennessee Department of Environment and Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243

Dear Mr. Stephens:

Thank you for submitting the State of Tennessee's 2014 annual ambient air monitoring network plan (Network Plan) dated June 30, 2014. The Network Plan is required by 40 Code of Federal Regulations (CFR) §58.10. The U.S. Environmental Protection Agency understands that the Tennessee Department of Environment and Conservation (TDEC) provided the public a 30-day review period and no external comments were received.

With this letter, the EPA is approving TDEC's Network Plan with the exception of one aspect. The EPA cannot officially approve a new proposed SO_2 site near the Eastman Chemical Company facility in Kingsport without all the requisite information required by 40 CFR §58.10(b). Once the EPA Region 4 is in agreement with the proposed locations for this site, the state will need to make that information available for public inspection. Upon completion of the public inspection process, an addendum to the Network Plan must be submitted to the EPA Region 4 for approval.

The EPA also requests that TDEC continue to include information about industrial monitors in future Network Plans and assessments. As TDEC states in its addendum to the 2013 Network Plan dated March 28, 2014, these monitors are not comparable to the national ambient air quality standards. However, since many of these monitors are required by TDEC air pollution permits, and the data from these monitors is reported to Air Quality System, the EPA believes that these monitors should be included in the Network Plan to allow for public input and notification about these monitors.

We have enclosed comments on your Network Plan and will continue to work with your agency on the remaining portions of the plan that have not been approved with this letter.

Thank you for working with us to monitor air pollution and promote healthy air quality in Tennessee. Please let us know of any problems in meeting any of the requirements we have identified. If you have any questions or concerns, please contact Gregg Worley at (404) 562-9141 or Darren Palmer at (404) 562-9052.

Sincerely,

Beverly H. Banister
Director
Air, Pesticides and Toxics Management Division

Enclosure

cc: Ms. Lynne A. Liddington, Department Head
Knox County Air Quality

Mr. Robert Rogers, Technical Manager
Shelby County Health Department Pollution Control Section

Mr. Bob Colby, Director
Chattanooga-Hamilton County Air Pollution Control Bureau

Mr. John Finke, Director
Nashville / Davidson County Metro Public
Health Department Pollution Control Division

CY 2014 State of Tennessee Ambient Air Monitoring Network Plan
U.S. EPA Comments and Recommendations

This document contains the U.S. Environmental Protection Agency comments and recommendations on the state of Tennessee's 2014 ambient air monitoring network plan (Network Plan). Ambient air monitoring rules, which include regulatory requirements that address network plans, data certification, and minimum monitoring requirements, among other requirements, are found in 40 CFR Part 58. Minimum monitoring requirements for criteria pollutants are listed in 40 CFR Part 58, Appendix D. Minimum monitoring requirements are listed for ozone (O_3), particulate matter less than 2.5 microns ($PM_{2.5}$), particulate matter less than 10 microns (PM_{10}), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), and lead (Pb).

The minimum monitoring requirements are based on core based statistical area (CBSA) boundaries as defined by the U.S. Office of Management and Budget (OMB), July 1, 2013, population estimates from the U.S. Census Bureau, and historical ambient air monitoring data. Minimum monitoring requirements for O_3, $PM_{2.5}$, PM_{10}, only apply to metropolitan statistical areas (MSAs), which are a subset of CBSAs. OMB currently defines 24 CBSAs in the state of Tennessee. These CBSAs and the respective July 1, 2013, population estimates from the U.S. Census Bureau are shown in Table 1.

Table 1: Core Based Statistical Areas and July 1, 2013 Population Estimates

CBSA Name	CBSA Type	Population
Nashville-Davidson--Murfreesboro--Franklin, TN	Metropolitan Statistical Area	1,757,912
Memphis, TN-MS-AR	Metropolitan Statistical Area	1,341,746
Knoxville, TN	Metropolitan Statistical Area	852,715
Chattanooga, TN-GA	Metropolitan Statistical Area	541,744
Kingsport-Bristol-Bristol, TN-VA	Metropolitan Statistical Area	308,283
Clarksville, TN-KY	Metropolitan Statistical Area	272,579
Johnson City, TN	Metropolitan Statistical Area	200,966
Jackson, TN	Metropolitan Statistical Area	130,645
Cleveland, TN	Metropolitan Statistical Area	118,538
Morristown, TN	Metropolitan Statistical Area	115,197
Cookeville, TN	Micropolitan Statistical Area	107,117
Tullahoma-Manchester, TN	Micropolitan Statistical Area	100,787
Sevierville, TN	Micropolitan Statistical Area	93,570
Greeneville, TN	Micropolitan Statistical Area	68,267
Crossville, TN	Micropolitan Statistical Area	57,466
Athens, TN	Micropolitan Statistical Area	52,341
Shelbyville, TN	Micropolitan Statistical Area	45,901
Lawrenceburg, TN	Micropolitan Statistical Area	41,990
McMinnville, TN	Micropolitan Statistical Area	39,965
Dyersburg, TN	Micropolitan Statistical Area	38,213
Union City, TN-KY	Micropolitan Statistical Area	37,516
Newport, TN	Micropolitan Statistical Area	35,479
Martin, TN	Micropolitan Statistical Area	34,450
Dayton, TN	Micropolitan Statistical Area	32,513
Paris, TN	Micropolitan Statistical Area	32,210
Lewisburg, TN	Micropolitan Statistical Area	31,130

Minimum O_3 Monitoring Requirements
40 CFR Part 58, Appendix D, Table D-2

The network described in the 2014 Network Plan meets the minimum O_3 monitoring requirements specified by 40 CFR Part 58, Appendix D, Table D-2 in all areas. Additionally, the proposed O_3 monitoring network described in the Network Plan meets all of the design criteria of 40 CFR Part 58.

The Network Plan states that Chattanooga-Hamilton County plans to relocate the Eastside Utility District O_3 monitor (AQS 47-065-4003) due to continued difficulty in accessing the site. Historical data show that this monitor has the highest O_3 design values of the two monitors in the Chattanooga, TN-GA CBSA. Please note that as soon as a new site is selected, revisions to the network, including discontinuation or relocation of a monitor, must be submitted to the EPA for approval.

Minimum PM_{10} Monitoring Requirements
40 CFR Part 58, Appendix A, 3.3.1
40 CFR Part 58, Appendix D, Table D-4

The state of Tennessee's current PM_{10} primary monitoring network meets the minimum requirements for all areas except as discussed for Chattanooga-Hamilton County in the Monitoring Network Changes Proposed by TDEC section of this document. All PM_{10} collocation requirements for manual methods found in 40 CFR Part 58, Appendix A, 3.3.1 are being met. Fifteen percent of each network of manual PM_{10} methods (at least one site) must be collocated. Also, the sites with collocated monitors should be among those measuring annual mean concentrations in the highest 25 percent of the network. These collocation requirements are assessed at the primary quality assurance organization (PQAO) level. The state of Tennessee and all of its local agencies currently operate under a single PQAO (TDEC) for manual PM_{10} sampling.

Minimum $PM_{2.5}$ Monitoring Requirements
40 CFR Part 58, Appendix A, 3.2.5
40 CFR Part 58, Appendix D, Table D-5

The state of Tennessee's $PM_{2.5}$ monitoring network meets the minimum requirements found in 40 CFR Part 58, Appendix D, Table D-5 for all MSAs. All manual $PM_{2.5}$ collocation requirements found in 40 CFR Part 58, Appendix A, 3.2.5 are also being met. Fifteen percent of each network of manual $PM_{2.5}$ methods (at least one site) must be collocated. Additionally, according to Appendix A, 3.2.5.3, 80 percent of collocated monitors should be deployed at sites with annual mean concentrations within +/- 20 percent of the NAAQS. The $PM_{2.5}$ monitoring network described in the 2014 Network Plan meets all of the design criteria of 40 CFR Part 58. The EPA requires that Knox County local program to change the monitor type of the Davanna Street $PM_{2.5}$ monitor (AQS 47-093-1013) from special purpose monitor (SPM) to state and local air monitoring station (SLAMS) monitor. This monitor continues to measure among the highest concentrations of $PM_{2.5}$ in the Knoxville ambient air monitoring network.

$PM_{2.5}$ Continuous Monitoring Requirements
40 CFR Part 58, Appendix D, 4.7.2

Regulatory requirements for continuous $PM_{2.5}$ monitoring require that "The State, or where appropriate, local agencies must operate continuous $PM_{2.5}$ analyzers equal to at least one-half (round up) the minimum required sites listed in Table D–5 of this appendix. At least one required continuous analyzer

in each MSA must be collocated with one of the required FRM/FEM/ARM [federal reference method/federal equivalent method /approved regional method] monitors, unless at least one of the required FRM/FEM/ARM monitors is itself a continuous FEM or ARM monitor in which case no collocation requirement applies." These minimum continuous $PM_{2.5}$ monitoring requirements are currently met in all of the MSAs in the state. Also, the continuous $PM_{2.5}$ collocation requirements are currently met in all MSAs. Therefore, the continuous $PM_{2.5}$ monitoring network described in the 2014 Network Plan meets all of the design criteria of 40 CFR Part 58.

$PM_{2.5}$ Background and Transport Sites
40 CFR Part 58, Appendix D, 4.7.3

40 CFR Part 58, Appendix D, 4.7.3 requires that "each State shall install and operate at least one $PM_{2.5}$ site to monitor for regional background and at least one $PM_{2.5}$ site to monitor for regional transport." The 2014 Network Plan identifies sites in Blount County (AQS 47-009-0101) and Hamilton County (AQS 47-065-0031 and AQS 47-065-1011) as regional transport sites and sites in Blount County (AQS 47-009-0101) and Lawrence County (AQS 47-099-0002) as regional background sites. Therefore, TDEC has satisfied the requirements of 40 CFR Part 58 for background and transport sites.

$PM_{2.5}$ Chemical Speciation Network

EPA has been conducting an assessment of the $PM_{2.5}$ Chemical Speciation Network (CSN) in an effort to optimize the network and create a network that is sustainable going forward. As a result of this assessment, the EPA is defunding a number of monitoring sites, eliminating the CSN $PM_{2.5}$ mass measurement, reducing the frequency of carbon blanks, reducing sample frequency at some monitoring sites, and reducing the number of icepacks in shipment during the cooler months of the year. In Tennessee, the EPA is defunding the Lockeland School (AQS ID: 47-037-0023), University of Tennessee-Chattanooga (AQS ID: 47-065-4002), and Lawrence County (AQS ID: 47-099-0002) sites. The state of Tennessee will be also be affected at all funded CSN sites by the elimination of the $PM_{2.5}$ mass measurement, the reduction of carbon blank frequency, and the reduction in icepacks. The CSN $PM_{2.5}$ mass measurement was eliminated in October 2014 and all other changes became effective in January 2015. Final changes to the CSN in the state of Tennessee should be reflected in the 2015 Network Plan.

Pb Monitoring Requirements
40 CFR Part 58, Appendix D, 4.5

The monitoring requirements for Pb found at 40 CFR Part 58, Appendix D, Section 4.5 require that "At a minimum, there must be one source-oriented SLAMS [State and Local Air Monitoring Station] site located to measure the maximum Pb concentration in ambient air resulting from each non-airport Pb source which emits 0.50 or more tons per year and from each airport which emits 1.0 or more tons per year..." Currently, monitoring is required near two sources in Tennessee: Exide Technologies in Bristol and Gerdau in Knoxville. Monitors near both of these sources are identified in the plan. 40 CFR Part 58, Appendix D, 3(b) requires that "NCore sites in CBSA with a population of 500,000 (as determined in the latest Census) or greater shall also measure Pb either as Pb-TSP or Pb-PM_{10}." This monitoring was required to begin on December 27, 2011. The Network Plan indicates that Pb-TSP sampling is ongoing at the Memphis NCore site (AQS 47-157-0075).

The Pb monitoring network described in the Network Plan meets all of the design criteria of 40 CFR Part 58. The documentation to relocate the existing Gerdau Pb site provided by Knox County in the Network Plan is deemed adequate. The EPA approves this relocation effective immediately. Please also see the Monitoring Network Changes section on Page 7 for additional information.

SO_2 Monitoring Requirements
40 CFR Part 58, Appendix D, 4.4

Ambient air monitoring network design criteria for SO_2 are found in section 4.4 of Appendix D to 40 CFR Part 58. This section requires that "The population weighted emissions index (PWEI) shall be calculated by states for each core based statistical area (CBSA)..." As a result, the SO_2 monitoring site(s) required in each CBSA will satisfy minimum monitoring requirements if the monitor(s) is sited within the boundaries of the parent CBSA and is of the following site types: population exposure, maximum concentration, source-oriented, general background, or regional transport. A SO_2 monitor at a National Core (NCore) station may satisfy minimum monitoring requirements if that monitor is located within a CBSA with minimally required monitors consistent with Appendix D 4.4.

The state of Tennessee has installed a SO_2 monitor at the existing O_3 monitoring site in Anderson County (AQS 47-157-0046) to meet the PWEI requirement of one SO_2 monitor for the Knoxville CBSA. This site satisfies the minimum SO_2 monitoring requirement for the Knoxville CBSA. In the addendum to the 2013 Network Plan dated March 28, 2014, Tennessee indicated that the Sullivan County SO_2 industrial monitor (AQS 47-163-0007) operated by the Eastman Chemical Company is not comparable to the NAAQS and will not be used to satisfy the PWEI requirement of one SO_2 monitor in the Kingsport-Bristol, TN-VA CBSA. Instead, Tennessee will establish and operate a new SO_2 monitoring site taking into consideration meteorological data and modeled emissions impacts.

The 2014 Network Plan does not include enough information for approval of the new SO_2 site near the Eastman facility at this time. Tennessee must submit an addendum to its 2014 Network Plan that includes a complete proposal for the site. At a minimum, the addendum must include all of the required information for proposed sites under 40 CFR §58.10(b). The addendum should also include TDEC's rationale for the location of the new proposed site, any monitoring or air modeling data that TDEC used to select the site, and supporting information about how the site location was selected, such as site photos, maps, wind roses, and about the target sources. The addendum should be made available for public inspection under 40 CFR § 58.10(a)(1), and then submitted to the EPA for approval.

NO_2 Monitoring Requirements
40 CFR Part 58, Appendix D 4.3

Ambient air monitoring network design criteria for NO_2 are found in Section 4.3 of Appendix D to 40 CFR Part 58. Three types of NO_2 monitoring are required: near-road, area-wide, and Regional Administrator. These types of NO_2 monitoring are described in sections 4.3.2, 4.3.3, and 4.3.4, respectively.

The EPA approves the selection of the Metro Archive near-road site (AQS 47-037-0040) in Nashville and the Southwest Tennessee Community College near-road site (AQS 47-157-0100) in Memphis because they meet the near-road NO_2 monitoring requirements for their respective CBSAs. [The Memphis near road site is being approved as the information contained in the Network Plan has satisfied the monitor siting criteria found in Appendix E to 40 CFR Part 58.] We request that the state include

updated site photos in its Network Plan due July 1, 2015. No other CBSA in Tennessee is currently required to have near-road NO_2 monitoring.

Section 4.3.2 of Appendix D to 40 CFR Part 58 also requires CBSAs with populations between 500,000 and 1,000,000 people to operate a near-road NO_2 monitor starting in January 1, 2017. Tennessee has two CBSAs with populations in this range: Chattanooga and Knoxville. As part of the 5-year NAAQS review cycle, the NO_2 monitoring requirements will be reviewed and may be modified in 2016. The NO_2 near-road monitoring requirements may change for CBSAs with populations between 500,000 and 1,000,000 people, such as the TN CBSAs listed above.

Ambient air monitoring network design criteria for area-wide NO_2 sites are found in 40 CFR Part 58, Appendix D, Section 4.3.3. Any CBSA with a population of 1,000,000 or more persons is required to monitor a location of expected highest NO_2 concentration representing the neighborhood or larger spatial scales. The Trinity Lane site (AQS 47-037-0011) was approved in fulfillment of the area-wide NO_2 monitoring requirement for the Nashville CBSA in 2013. In the Network Plan, Tennessee identifies the monitor type for this site as unknown; however in AQS, the monitor type is listed as SLAMS. The EPA assumes this to be a typographical error in the plan and approves the monitor as a SLAMS monitor. The EPA requests that the Nashville agency correct the monitor type in the Network Plan which is due July 1, 2015. The area-wide requirement for the Memphis CBSA is being met by the monitor operated in Marion, Arkansas by the state of Arkansas. The continued operation of this site is outlined in the memorandum of agreement between the Shelby County Health Department and the states of Tennessee, Arkansas, and Mississippi, which is included in the Network Plan.

Ambient air monitoring network design criteria for Regional Administrator required NO_2 monitoring, often referred to as RA-40 monitoring, are found in 40 CFR Part 58, Appendix D, Section 4.3.4. This section states that "the Regional Administrators, in collaboration with states, must require a minimum of forty additional NO_2 monitoring stations nationwide in any area, inside or outside of CBSAs, above the minimum monitoring requirements, with a primary focus on siting these monitors in locations to protect susceptible and vulnerable populations. The Regional Administrators, working with states, may also consider additional factors to require monitors beyond the minimum network requirement." No monitors have been identified in the state's Network Plan as meeting the requirements of a Regional Administrator required NO_2 monitor. However, not all states are required to have such monitors and none were proposed by the EPA for the state. Thus, there is no deficiency with this requirement in the state's plan. The full list of NO_2 monitors identified by the Regional Administrators can be found on the EPA's website at http://www.epa.gov/ttnamti1/svpop.html.

Operating Schedules
40 CFR § 58.12

The monitoring network proposed in the Network Plan meets the required operating schedules for all continuous analyzers and all manual Pb, $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, and $PM_{2.5}$ Speciation Trends Network monitors. TDEC has not proposed any changes to its operating schedules in the 2014 Network Plan.

Monitoring Network Changes Proposed by TDEC

On Pages 7-8, the Network Plan identifies proposed changes to the state's ambient air monitoring network. As discussed previously, TDEC plans to establish a new SO_2 monitoring site in the vicinity of the Eastman Chemical Company facility in Kingsport. EPA will work with the state to expedite the

establishment of the site once appropriate documentation is provided to the EPA. The plan also states a need to relocate two sites in Knoxville: the Gerdau steel mill Pb site (AQS 47-093-0023) due to a change in the right of way near the current site, and the Air Lab site (AQS 47-093-1013) due to a request from the property owner. The Network Plan provides all required information and the EPA approves the relocation of both sites.

The Memphis MSA is required to maintain 2-4 monitors. The Network Plan states that the Memphis local agency wishes to shut down its Fite Road PM_{10} monitor (AQS 47-157-0046). Approval was granted to shut down this site in the EPA's response to the state's network plan in 2012. Two other PM_{10} monitoring sites are located in the Memphis MSA and both are in Shelby County. Should further network modifications be warranted, it is recommended that Shelby County coordinate any changes with the states of Arkansas and Mississippi so the minimum requirements continue to be met.

The EPA approves the termination of the Meigs County O_3 SPM (AQS 47-121-0104) retroactive to November 1, 2013. This monitor is not located in a CBSA and is not required under 40 CFR Part 58, Appendix D. The EPA also approves the consolidation of the Loudon Pope site (AQS 47-105-0108) with the Loudon Middle School (AQS 47-105-0109). The Loudon Middle School site will now house an O_3 analyzer and $PM_{2.5}$ sampler.

The addendum to the 2013 network plan correctly states that the EPA provided separate formal approval to discontinue operation of the Broadway CO site in Nashville (AQS 47-037-0021). Please note that the EPA requests, to the greatest extent practicable, any requests to establish, relocate, or discontinue monitoring sites be included in Network Plans.

Finally, in an August 28, 2014, letter separate from the 2014 Tennessee Network Plan, Chattanooga-Hamilton County requested to shutdown two PM_{10} monitors at its site at 3300 Broad Street, Chattanooga, TN (Air Quality System # 47-065-0006). The basis for the request was that the PM_{10} mass concentration levels in the Chattanooga, TN-GA MSA, as measured at the site, are very low and that continued monitoring at that site wastes resources that could be better spent on other monitoring activities. For the last 10 years, the maximum PM_{10} concentrations at the site have been less than a third of the PM_{10} National Ambient Air Quality Standard (NAAQS) of 150 micrograms per cubic meter over a 24 hour average period.

The EPA regulations specify minimum monitoring requirements for PM_{10} in 40 CFR Part 58, Appendix D, Table D-4. This table indicates that based on population, the MSA should have a minimum of one PM_{10} monitor. The Broad Street site is the only site measuring PM_{10} in the MSA. Thus, if it only considered the requirements in Table D-4, the EPA would need to disapprove Chattanooga-Hamilton County's request. However, 40 CFR Part 58, Appendix D 4.6(a), which discusses PM_{10} design criteria, allows modifications from the PM_{10} monitoring requirements with approval by the Regional Administrator. Thus, when the EPA reviewed the shutdown request, it not only considered the minimum monitor requirements, it also reviewed the request in light of the low concentrations measured at the site over the last 10 years and the County's contention that continued monitoring at that site is a waste of resources that could be better spent on other monitoring activities. After much consideration, the EPA agrees with the County on the limited utility of operating this site and approves the shutdown request. EPA has determined that discontinuance does not compromise data collection needed for implementation of the current PM_{10} NAAQS. If the PM_{10} NAAQS is revised, this approval may be reconsidered. Please reflect this shutdown in the state's 2015 Network Plan so that the public is notified.

Air Quality Index (AQI) Reporting
40 CFR § 58.50

AQI reporting is required for MSAs with populations of 350,000 or more. There are four MSAs in the state of Tennessee that meet this criterion: Chattanooga, Tennessee-Georgia; Knoxville, Tennessee; Memphis, Tennessee-Mississippi-Arkansas; and Nashville-Davidson-Murfreesboro, Tennessee. The Network Plan indicates that an AQI is being reported in each of these MSAs. Thus, the state is meeting its AQI reporting requirements. In addition, however, TDEC is also voluntarily reporting an AQI for the Kingsport-Johnson City-Bristol, Tennessee-Virginia Combined Statistical Area and the Clarksville-Montgomery County Combined Statistical Area.

National Core (NCore) Monitoring Network

TDEC has designated two NCore sites in the 2014 Network Plan. The first site (AQS 47-157-0075) is located at Shelby Farms on Haley Road in Memphis. The EPA approval was granted on October 30, 2009. Memphis-Shelby County's quality assurance project plan was submitted to the EPA on June 29, 2010, with a subsequent revision submitted on July 30, 2010.

The Look Rock site (AQS 47-009-0101) is designated as a rural NCore site and is located in the Great Smoky Mountain National Park. The site has been operated collaboratively for many years by the National Park Service (NPS), the Tennessee Valley Authority (TVA), the TDEC and the EPA. In early 2014, TVA informed the EPA, TDEC and NPS of its intention to discontinue all air monitoring activities at the site as of October 2014 and transfer ownership of its monitoring equipment to one or more interested parties. NPS, TDEC and the EPA Region 4 and OAQPS had several discussions and agreed that some of the measurements that TVA had been collecting were valuable and needed to be continued. The EPA decided to fund these activities. Combined with the other measurements taken at the site, the parties have agreed to fund and maintain operations of all required criteria pollutant measurements listed in the definition of NCore in 40 CFR §58.1 for the near future. The pollutants to be monitored and operational guidelines of the Look Rock site will continue to be based on the data needs of NPS, TDEC, and the EPA. The EPA requests that the state update the NCore section in the 2015 Network Plan to reflect these changes.

Memoranda of Agreement (MOA) with Neighboring States

Tennessee and Kentucky have a monitoring memorandum of agreement (MOA) addressing O_3 and continuous $PM_{2.5}$ monitoring in the Clarksville, TN-KY CBSA. In addition, Tennessee, Arkansas and Mississippi have a MOA addressing PM_{10}, $PM_{2.5}$ and O_3 monitoring in the Memphis, TN-MS-AR CBSA. Previous correspondence between TDEC and the EPA indicated that the state would pursue a MOA with the Commonwealth of Virginia governing monitoring responsibilities in the Bristol, Tennessee/Bristol, Virginia area. If and when it enters into a MOA with Virginia, TDEC should update its Network Plan to reflect that change.

Appendix B

Memorandum of Agreement with State of Georgia

MEMORANDUM OF AGREEMENT

ON AIR QUALITY MONITORING FOR CRITERIA POLLUTANTS FOR

THE CHATTANOOGA-WALKER COUNTY

METROPOLITAN STATISTICAL AREA MSA

January 13, 2009

Participating Agencies:

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

Tennessee
Chattanooga-Hamilton County Air Pollution Control Bureau

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) (October 17, 2006)[1].

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)[1] 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."[1]

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..."[1] 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 15th, 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

Susan Zimmer-Dauphinee
GAEPD APB Ambient Monitoring Program
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CHCAPCB

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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, Parts 53 and 58, Revisions to Ambient Air Monitoring Regulations; Final Rule. Part 58-[AMENDED]. 'Appendix D to part 58-Network Design Criteria for Ambient Air Quality Monitoring, Section 2(e)." Federal Register/Vol.71, No. 200/Tuesday, October 17, 2006, Rules and Regulations, Page 61317.

IX. APPROVALS

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

BY: James Capp

TITLE: Branch Chief

DATE: January 23, 2009

Chattanooga-Hamilton County Air Pollution Bureau (CHCAPCB)

BY: Robert H Cely

TITLE: Director

DATE: January 14, 2009

Appendix C

Letter to EPA requesting Exceptional Event Status

November 2016 Wildfires

Chattanooga-Hamilton County Air Pollution Control Bureau

April 21, 2017

Ms. Beverly Banister
Director
Air, Pesticides, and Toxics Management Division
USEPA Region IV
61 Forsyth Street
Atlanta, Georgia 30303-8960

Dear Ms. Banister:

This letter is to inform EPA Region 4 of the Chattanooga-Hamilton County Air Pollution Control Bureau's (CHCAPCB) intent to submit a demonstration request for Exceptional Event status for data in November, 2016, during wildfires in the Tennessee/Georgia area. Large wildfires partially encircled Hamilton County on Mowbray and Signal Mountains in Tennessee; Lookout Mountain in Georgia; and in nearby counties both in Tennessee and Georgia. From November 7- November 23 these fires produced massive amounts of smoke that affected Hamilton County and increased $PM_{2.5}$ data to record high levels. The November 14 data at 105.7 µg/m^3 was significantly higher than any Federal Reference Monitor (FRM) data since $PM_{2.5}$ FRM monitoring began in Hamilton County January 1, 1999. The FRM data for November 8, 11, and 17 were affected by the smoke but the data did not exceed 35 µg/m3. Data not exceeding 12 µg/m^3 has been omitted from Figure 1. The Walker Co., Georgia, data has been included in this chart as a courtesy. Other data days not requested for Exceptional Event status may have been affected.

Figure 1

All data in µg/m^3

Date	470654002-1 Siskin Drive	470654002-2 Siskin Drive	470650031 Tombras Avenue	130950002 Maple St. Walker Co.GA
November 8	15.2	15.2	-	-
November 11	-	-	13.9	Void
November 14	105.7	105.7	Void	84.3
November 17	21.0	21.1	18.0	16.9

At EPA's request the Chattanooga-Hamilton County data was flagged initially in AQS with informational "IT" flags. Those flags are now changed to "rt" flags indicating that EPA will formally be sent Exceptional Event requests to exclude this data.

A tanker plane and Blackhawk helicopters were brought in to fight the fires on Mowbray and Signal Mountains because of the difficulty of effectively containing fires on mountain slopes under extremely dry weather conditions and because of the proximity of the fires to residential areas. Some residents of both mountains were evacuated temporarily, and additional firefighters were sent in from around the southeast, Texas, California, Nevada, and Oregon to assist. A Blackhawk

helicopter was also used with the Lookout Mountain/Dade County fires, and outside firefighters were called in to assist.

The *Chattanooga Times Free Press* on November 17 in an article entitled "Choking on Smoke" published a list of major fires in Hamilton and nearby counties both in Tennessee and Georgia. These are listed in Figure 2. The most devastating effects on Hamilton County air quality were the fires on Signal Mountain, Lookout Mountain/Dade County, Mowbray Mountain, and the particularly large Rough Ridge fire in North Georgia.

Hamilton County is bordered on the east by White Oak Mountain and on the west by Mowbray, Signal, Elder, Raccoon, and Lookout Mountains. The county is bisected down the middle by Big Ridge and Missionary Ridge, part of the same ridge chain. The ridge name changes where the Tennessee River runs through the ridge horizontally. The "A" shaped valley is such that when smoke infiltrates, it fills the valley and lingers.

Note that the Rough Ridge fire of North Georgia of 23,000 acres was only 30% contained by November 17. This fire was in the Cohutta Wilderness in the Chattahoochee National Forest about 13 miles west of Blue Ridge, Georgia, in Fannin County. It began with a lightning strike on October 16, 2016.

Figure 2

Fire Name	Location	Size	Contained by 11/17
Major Tennessee Wildfires			
Flipper Bend	Hamilton Co., Signal Mt.	1,000 acres by 11/17	95%
Poe Road	Hamilton Co.	686 acres by 11/17	60 %
Mowbray Mt	Hamilton Co., Mowbray Mt.	830 acres by 11/17	70 %
Hobbstown	Sequatchie Co.	65 acres by 11/17	100%
Sunshine	Sequatchie Co.	65 acres by 11/17	100%
Bench Bluff	Bledsoe Co.	1400 acres by 11/17	100%
Major Georgia Wildfires			
Rough Ridge	Fannin Co.	23,000 by 11/17	30%
Fox Mountain	Dade Co./Rising Fawn	2,039 by 11/17	100%
Rocky Face	Whitfield Co.	590 by 11/17	99%
Tatum Gulf	Dade Co.	1600 by 11/17	15%
Sulfur Springs	Dade Co., Lookout Mt.	500 by 11/17	100%
Treat Mt.	Polk/Haralson Counties	583 by 11/17	99%
Rock Mountain	Rabun Co.	5,484 by 11/17	10%
Flat Branch	Rabun/Towns Counties	600 by 11/17	4%
Creek Road	Dade Co.	100 acres by 11/17	98%
Timber Bluff	Rabun Co.	850 Acres by 11/17	15%
* List excerpted from "Choking on Smoke" article in *Chattanooga Times Free Press* 11/17/16			

Figure 3

Agency	State	County	Event Name in AQS	Type of Event in AQS	Site	AQS ID	µg/ m3	Sample Date of the Event	FRM Monitor Exceedance µg/m3
CHCAP CB	TN	Hamilton	US Wildfires	Flagged as "rt"	Siskin Dr.	47065 4002-1	>35	11/14/2016	105.7
CHCAP CB	TN	Hamilton	US Wildfires	Flagged as "rt"	Siskin Dr.	47065 4002-2	>35	11/14/2016	105.7
State: GA	GA	Walker Co., GA	US Wildfires	Flagged as "IT" by GA	Maple St.	13295 0002	>35	11/14/2016	84.3
Data Affected: >12 but <35 µg/m3									
CHCAP CB	TN	Hamilton	US Wildfires	Flagged as "rt"	Siskin Dr.	47065 4002-1	<35 >12	11/8/2016	15.2
CHCAP CB	TN	Hamilton	US Wildfires	Flagged as "rt"	Siskin Dr.	47065 4002-2	<35 >12	11/8/2016	15.2
CHCAP CB	TN	Hamilton	US Wildfires	Flagged as "rt"	Siskin Dr.	47065 4002-1	<35 >12	11/17/2016	21.0
CHCAP CB	TN	Hamilton	US Wildfires	Flagged as "rt"	Siskin Dr.	47065 4002-2	<35 >12	11/17/2016	21.1
CHCAP CB	TN	Hamilton	US Wildfires	Flagged as "rt"	Tombras Av.	47065 0031	<35 >12	11/11/2016	13.9
CHCAP CB	TN	Hamilton	US Wildfires	Flagged as "rt"	Tombras Av.	47 065 0031	<35 >12	11/17/2016	18.0
State: GA	GA	Walker Co., GA	US Wildfires	Flagged as "IT" by GA	Maple St.	13295 0002	<35 >12	11/17/2016	16.9

Chattanooga-Hamilton County's design values are lower than the standards for the three year period 2014-2016 when including the smoke affected data, but a request for Exceptional Event status is being submitted because the magnitude of the data for each of the next two years cannot be anticipated. It seems prudent to make the submission while EPA is reviewing other submissions for the same event.

EPA has requested that this letter provide the current design values for affected sites and the design values with the affected data removed. Because the data is already of low magnitude, the design values are affected minimally. The daily design value does not appear to change when affected data is removed. The design values are in Figure 4.

Figure 4
All data in µg/m3

Site	Design Value 2014-16 Yearly Standard	Design Value 2014-16 Daily Standard	DV 2014-16 Yearly 11/14 Removed	DV 2014-16 Daily 11/14 Removed	DV 2014-2016 Yearly All flagged Removed	DV 2014-2016 Daily All flagged Removed
470654002 Siskin Dr	8.7	17	8.4	17	8.4	17
470650031 Tombras Ave	8.6	18	11/14: Void	18	8.6	18

Figure 5 indicates the one year quarterly average for 2016. This chart indicates that the yearly average would benefit by about 1 µg/m^3 to have the affected data removed from the data set.

Figure 5
All data in µg/m3

Site	2016 Quarterly Avg	2016 Quarterly Avg Excluding 11/14	2016 Quarterly Avg Excluding All Flagged
470654002 Siskin Dr.	8.9	8.1	7.9
470650031 Tombras Ave.	*8.0	8.0	7.9
*11/14 was a Void for the Tombras site			

EPA has requested a target date for submittal of the Exceptional Event package to Region 4. The State of Tennessee plans to post the state and local agency wildfire demonstrations for public comment and to submit the demonstrations to Region 4 by July 1, 2017. If a workgroup is formed and the Bureau participates, the date of submittal may be later.

I trust that this letter satisfies the requirements to notify EPA of an impending Exceptional Event submission request and to notify EPA of extreme data that exceeds the standard. If you have any questions please feel free to contact me or Kathy Jones, Air Monitoring Manager, at (423) 643-5980.

Sincerely,

Robert Colby
Director
CJ

C: Ms. Beverly Banister, Mr. Gregg Worley, Mr. Todd Rinck, Mr. Darren Palmer,
Ms. Sara Waterson, EPA
Mr. Jason Stephens, Mr. Robert Brawner, Mr. Billy Pugh, State of Tennessee: e-mail
Ms. DeAnna Oser, State of Georgia: e-mail

Ambient Air Monitoring Plan

Knox County, TN

Department of Air Quality Management

Knox County
Health Department
Every Person. A Healthy Person

Prepared by:
Amber Talgo and Rebecca Larocque
April 18, 2016

Table of Contents

Introduction

The Air Quality Monitoring Network Plan (Plan) is produced by the Knox County Department of Air Quality Management (KCDAQM) on an annual basis in order to meet three objectives. First, the Plan development process establishes the structure for the department to evaluate its existing ambient air monitoring network and to propose changes to the network based on modified data needs, changing regulatory requirements, and available resources. Second, the Plan provides opportunity for the KCDAQM to solicit, evaluate, and respond to comments and input from the State of Tennessee Department of Environment and Conservation Division of Air Pollution Control's (TDEC-APC), the general public and other interests regarding the network. Third, the Plan is developed and submitted to the Region 4 Office of the United States Environmental Protection Agency (EPA Region 4) in fulfillment of the requirements contained in Title 40 of the Code of Federal Regulations (CFR) Part 58.10.

The Plan is intended to accurately describe the monitoring sites in the network, identify their monitoring purpose, describe how the sites fulfill Network Design criteria, and describe any deviations in physical characteristics or operation from regulatory requirements. The Plan also describes changes the KCDAQM anticipates making to the network in the next year.

The KCDAQM monitors air quality principally by measuring concentrations of criteria air pollutants pursuant to the federal Clean Air Act in an endeavor to meet three basic monitoring objectives:

1. Provide air pollution data to the general public in a timely manner.

2. Support compliance with ambient air quality standards and emissions strategy development.

3. Support air pollution research studies.

Criteria air pollutants are the most common air pollutants with known harmful human health effects. The six criteria pollutants are:

- carbon monoxide (CO);
- sulfur dioxide (SO_2);
- lead (Pb);
- nitrogen dioxide (NO_2);
- ozone (O_3); and
- particulate matter (PM). PM includes airborne materials in two size fractions, those with an aerodynamic diameter of 10 microns and less (PM_{10}), and those with an aerodynamic diameter of 2.5 microns and less ($PM_{2.5}$).

For each criteria air pollutant, National Ambient Air Quality Standards (NAAQS) are established to protect public health and the environment. Two types of federally mandated air quality standards may exist. Primary standards set limits to protect public health, including the health of at-risk populations such as people with pre-existing heart or lung disease (such as asthmatics), children, and older adults. Secondary standards set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings.

The Plan is provided in three broad sections. The first section describes the various pollutant-specific ambient air monitoring design requirements and explains how the KCDAQM has implemented each as applicable. The second section describes changes to the monitoring network that the KCDAQM is proposing. The final section includes details on each of the monitoring locations and three appendices providing population data, climate date, and an equipment condition list.

The KCDAQM Monitoring Network has in the past been incorporated in the State of Tennessee Department of Environment and Conservation Division of Air Pollution Control's (TDEC-APC) Primary Quality Assurance Agency (PQAO). As of January 1, 2015 the KCDAQM assumed the role of PQAO for its ambient air monitoring network. TDEC-APC and KCDAQM both have ambient air monitors in the Knoxville CBSA. This document will include all required information to monitor and assess the needs of the population served by KCDAQM.

I. Ambient Air Monitoring Requirements

The term 'ambient air' is defined in 40 CFR 50.1 as "that portion of the atmosphere, external to buildings, to which the general public has access. " Federal rules implemented by the United States Environmental Protection Agency (EPA) require each state to establish a network of monitors to measure concentrations of criteria pollutants in ambient air based upon population, regional air quality, and regulatory concerns. Table 1 represents a snapshot of all the pollutants required monitors and those operating within the KCDAQM network. The following sections will explain further the ambient air monitoring requirements for each of the criteria air pollutants, and explain the KCDAQM's implementation of them.

Table 1

			14129 Lead		42101 CO		42401 SO2		42602 NO2		44201 O3		81102 PM 10		88101 PM 2.5		88502 PM 2.5 Speciation		88501 PM 2.5 Cont.	
CBSA code	CBSA 2016 Population Estimate	MSA 2016 Population Estimate	Op	Req	Op	Req	Op	Req	Op	Req	Op	Req	Op	Req	Op	Req	Op	Req	Op	Req
28940	868,546	731,332	4	1	0	0	0	1	0	0	2	2	1	1	5	1	1	1	1	1

A. Ozone (O_3) Monitoring Criteria

The minimum number of ozone monitors required by 40 CFR Part 58, Appendix D is summarized in Table 2.

Table 2- Minimum O_3 Requirements [1]

Metropolitan Statistical Area (MSA) population [2,3]	Number of Monitors Per MSA	
	Most recent 3-year design value ≥ 85% of NAAQS [4]	Most recent 3-year design value < 85% of NAAQS [4,5]
> 10 milliion	4	2
4 -10 million	3	1
350,000 - < 4 million	2	1
50,000 - < 350,000 [6]	1	0

[1] From table D-2 of Appendix D to 40 CFR Part 58

[2] Minimum monitoring requirements apply to the (MSA)

[3] Population based on latest available census figures.

[4] O_3 NAAQS levels are defined in 40 CFR part 50

[5] Minimum monitoring requirements apply in absence of a design value

[6] MSA defined as urbanized area of 50,000 or more population.

Knox County is part of the Knoxville Metropolitan Statistical Area which consists of Anderson, Blount, Knox, Loudon and Union Counties. See appendix A for further information on the Knoxville MSA. According to the 2010 Census and the extrapolated US Census Bureau's Population Estimate Program, the Knoxville MSA falls within the 350,-<4million population category. Knox County operates ozone monitoring sites at Springhill Elementary (47-093-1020) and East Knox Elementary (47-093-0021). Table 3 summarizes the 8-hour O_3 values measured at the monitoring sites during the designated ozone season (March-October) of 2016. Both sites are within 85% of the current NAAQS of .070 ppm.

Table 3 – 8hr Rolling Ozone Season 2016

Station	Concentrations (ppm)			NAAQS Design Value 2016
	Minimum	Maximum	Average	
East Knox	.000	.073	.030	.064
Springhill	.000	.075	.031	.066

The monitoring directives in 40 CFR Appendix D Section 5 contain specific requirements for the operation of Photochemical Assessment Monitoring Stations (PAMS) in areas classified as serious, severe, or extreme nonattainment for O_3. Knox County does not contain any O_3 nonattainment areas, therefore no PAMS monitoring is required of the KCDAQM.

B. Carbon Monoxide (CO) Monitoring Criteria

Per 40 CFR 58 Appendix D Section 4.2, the requirements for CO monitoring sites are closely related to the requirements for near-road NO2 monitoring sites (see Section I.C.). Table 4 summarizes the number of required CO monitoring sites.

Table 4 - Minimum CO Monitoring Requirements [1]

Criteria	Number of Near-Road CO Monitors Required
CBSA Population ≥ 1,000,000	One, collocated with an NO_2 monitor or in an alternative location approved by the EPA

[1] From Appendix D of 40 CFR Part 58, Sec 4.2.1

As documented in Appendix A, the Knoxville CBSA does not meet the listed criteria, and no CO monitors are required. There are no CO monitors in the KCDAQM monitoring program.

C. Nitrogen Dioxide (NO_2) Monitoring Criteria

The minimum number of NO_2 monitoring sites required by 40 CFR 58 Appendix D Section 4.3 is summarized in Table 5.

Table 5 - Minimum NO_2 Monitoring Requirements [1]

Requirement Type	Criteria	Minimum Monitors Required
Near road	CBSA Population ≥ 1,000,000	1
	CBSA Population ≥ 2.5 Million	2
	CBSA Population ≥ 1,000,000 and Road Segments with annual average daily traffic counts ≥ 250,000	2
Area- Wide	CBSA Population ≥ 1 Million	1
Protection of Susceptible and Vulnerable Populations	Any area inside or outside CBSAs	As required by EPA Administrator [2]

[1] From 40 CFR 58 Appendix D Section 4.3
[1] From 40 CFR 58 Appendix D Section 4.3.4 (b)

As documented in Appendix A, the Knoxville CBSA does not meet the listed criteria, and no NO_2 monitors are required. There are no NO_2 monitors in the KCDAQM monitoring program.

D. Sulfur Dioxide (SO_2) Monitoring Criteria

The minimum number of SO_2 monitoring sites required by 40 CFR 58 Appendix D Section 4.4 is shown in Table 6.

Table 6 - Minimum SO_2 Monitoring Requirements [1]

CBSA PWEI [2]	Minimum Number of SO_2 Monitors
≥ 1,000,000	3
<1,000,000 - ≥ 100,000	2
<100,000 - ≥ 5,000	1

[1] From Appendix D to 40 CFR Part 58, Sec 4.4.2

[2] Core Based Statistical Area Population Weighted Emissions Index

The EPA criteria used to determine the numbers of required SO_2 monitors is based upon two metrics: the Core Based Statistical Area (CBSA), and the Population Weighted Emissions Index (PWEI). The Knoxville CBSA as described in Appendix A, is required to have SO_2 monitoring based on these metrics. The Knoxville CBSA PWEI can be calculated as follows:

Knoxville CBSA 2014 Census Estimate: 857,585
2014 SO2 Emissions (tons per year): 29,280
PWEI= (861,424 x29, 280)/1,000,000: 25,222.5

This requirement is met by the TDEC-APC site 0101 located in Anderson County within the Knoxville CBSA.

E. Lead (Pb) Monitoring Criteria

The lead monitoring design rule in 40 CFR 58 Appendix D Section 4.5 requires monitoring agencies to establish air quality monitoring near industrial facilities that emit more than 0.5 tons per year (tpy) of lead into the atmosphere, and at specified airports. None of the listed airports are located in Knox County, but one facility reports annual lead emissions in excess of the 0.5 tpy emissions threshold. The Gerdau plant reported total lead emissions of 0.52 tons for calendar 2016. The value exceeds the 0.5 typ monitoring threshold. KCDAQM operates 4 lead monitoring sites surrounding the site which includes one collocated site. The Ameristeel site (47-093-0023) is the source oriented site required by the rule. This site was established to provide data closer to the source facility. The Burnside site (47-093-0027) contains an official and collocated monitor. It was the source specific monitor until 2011 when replaced by Ameristeel. The KCDAQM continues to operate the Burnside site (47-093-0027) and the

additional Rule site (47-093-1017) for population exposure data as well as maintaining the historical data the Burnside site provides. The environmental justice implications of the urban locations for these sites provide additional reasons for the KCDAQM's continued investment in these sites.

F. Particulate Matter (PM_{10}) Monitoring Criteria

The minimum number of PM_{10} monitoring sites required by 40 CFR 58 Appendix D Section 4.6 is shown in Table 7.

Table 7 Minimum PM_{10} Monitoring Requirements [1]

	Number of Monitors per MSA [1]		
Population Category	**High Conc.** [2]	**Medium conc.** [3]	**Low conc.** [4][5]
>1,000,000	6 - 10	4 - 8	2 - 4
500,000 - 1,000,000	4 - 8	2 - 4	1 - 2
250,000- 500,000	3 - 4	1 - 2	0 - 1
100,000 - 250,000	1 - 2	0 - 1	0

[1] From Table D-4 of Appendix D to 40 CFR Part 58. Selection of urban areas and number of stations per MSA within ranges show are jointly determined by EPA, TDEC, and KCDAQM

[2] High concentration areas are those for which data exceeds the NAAQS by 20 % or more

[3] Medium concentration areas are those for which data exceeds 80% of the NAAQS

[4] Low concentration areas are those for which data is less than 80% of the NAAQS

[5] Low concentration requirements apply in the absence of a design value.

The Knoxville MSA is a low concentration 500,000-1,000,000 population category requiring 1-2 monitor. The KCDAQM operates one continuous TEOM 1405 as approved in the 2015 network plan.

G. Fine Particulate Matter ($PM_{2.5}$) Monitoring Criteria

The minimum number of $PM_{2.5}$ monitoring sites required by 40 CFR 58 Appendix D Section 4.7 is shown in Table 8.

Table 8 - Minimum $PM_{2.5}$ Monitoring Requirements [1]

	Number of Monitors per MSA	
MSA Population [2]	Most recent 3 year design value ≥ 85% of any $PM_{2.5}$ NAAQS [3]	Most recent 3 year design value < 85% of any $PM_{2.5}$ NAAQS [3][4]
> 1,000,000	3	2
500,000 - 1,000,000	2	1
50,000 -<500,000	1	0

[1] From Table D-5 of appendix D to 40 CFR Part 58.

[2] Population based on latest available census figures.

[3] $PM_{2.5}$ NAAWS levels are defined in 40 CFR part 50

[4] Minimum monitoring requirements apply in absence of design value

Based upon the population data and most recent design values, the Knoxville MSA is required to operate 1 $PM_{2.5}$ monitor. In 2015 the design value came below 85% of the NAAQS and therefore this number is reduced from previous years from 2 required. The KCDAQM operates 5 SLAMS monitors including a collocated monitor and 1 SPM continuous monitor for Air Quality Index (AQI) reporting. On January 1st 20017, KCDAQM reduced the sample frequency of the Spring Hill, Rule and Bearden $PM_{2.5}$ monitors from daily sampling to 1:3 day sampling. This change was made due to the price of filter analysis and is supported by 40 CFR part 58 Subpart B 58.12. KCDAQM operates these monitors to demonstrate continuing NAAQS compliance, provide information for control strategies and to inform the public of health impacts during events. In October thru December of 2016 East Tennessee and areas surrounding Knox County experienced an outbreak of wildfires that affected the PM 2.5 statistical data. KCDAQM is preparing to submit a letter of intent to EPA, of the intention to submit an exceptional events demonstration in conjunction with the State of Tennessee Air Pollution Control for these outlier data that are above the NAAQS standard. If approved, this will exclude the use of the outlier data for NAAQS compliance in the statistical design values. Table 9 gives both the design value including the exceptional data and excluding the data.

Table 9 – PM2.5 NAAQS Comparisons

Site	NAAQS Design Values($\mu g/m^3$)			
	With Exceptional Data 2014-2016		Excluding Exceptional 2014-2016	
	24 hour	Annual	24 hour	Annual
Air Lab	33	10.4	17	9.6
Bearden	20	9.3	19	9.1
Rule	21	9.9	19	9.6
Springhill	20	9.2	18	8.9

The $PM_{2.5}$ monitoring criteria in 40 CFR 58 Appendix D Section 4.7 contains two additional significant requirements. First, Section 4.7.4 requires that each state continue to conduct $PM_{2.5}$ Chemical Speciation monitoring at locations designated to be part of the national Speciation Trends Network (STN). KCDAQM operates one of these speciation sites at Springhill Elementary (47-093-1020).

Second, Section 4.7.2 requires that agencies operate continuous analyzers in at least one-half of the required PM2.5 monitoring sites and at least one analyzer per MSA must be collocated with a sequential Federal Reference Method (FRM) analyzer. In 2015 the KCDAQM installed a Beta 5014i continuous monitor at the Air Lab site collocated with the TEOM 1405A monitor which was previously used to meet this continuous monitoring requirement. The Beta 5014i will replace the TEOM1405a. Data collected from the Beta 5014i or the TEOM 1405A for $PM_{2.5}$ continuous does not meet the criteria set for an FRM/FEM/ARM monitor and should not be used towards determinations of NAAQS compliance.

H. National Core Monitoring Site (NCore) Monitoring Criteria

Section 3 of Appendix D to 40 CFR part 58 requires that each state operate at least one NCore multi-pollutant monitoring site. . By definition, each NCore site must include monitoring equipment to measure $PM_{2.5}$, $PM_{10\text{-}2.5}$, speciated $PM_{2.5}$, O_3, SO_2, CO, NO, NOx, lead, and basic meteorology. Knox County is not a chosen NCore site within the State of Tennessee.

II. Proposed Changes to KCDAQM Ambient Air Monitoring Network

A. Shut down of Rule (1017) lead monitoring site

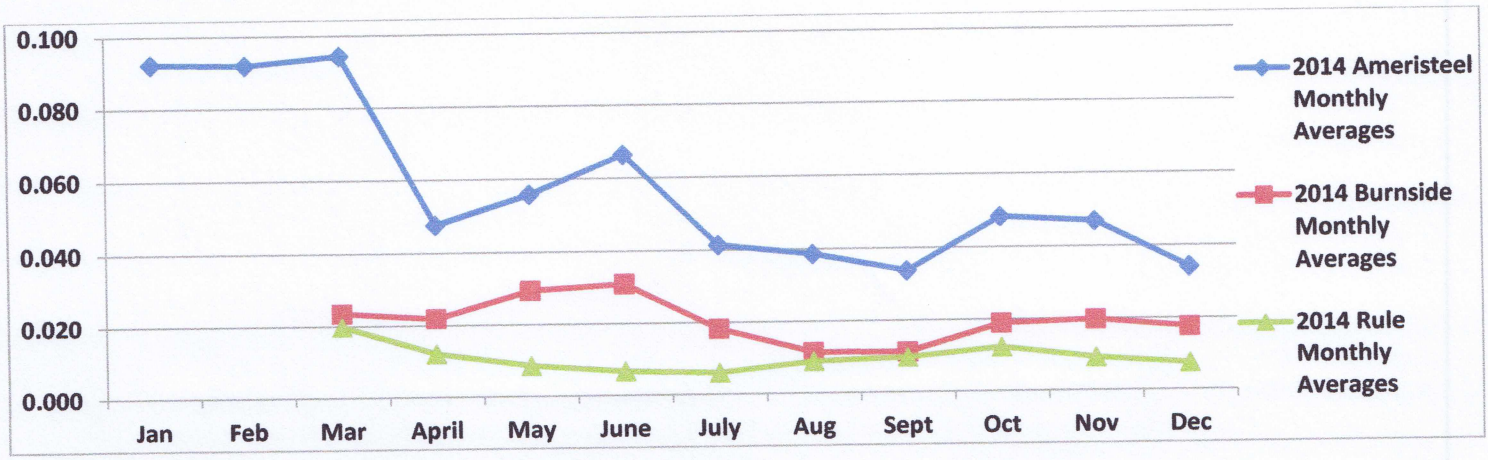
KCDAQM is proposing to eliminate the Rule (1017) lead monitoring site. KCDSAQM is currently required to operate 1 lead monitor yet operates 3 sites and 4 monitors (See Table 1). The Rule site has had the lowest design value (Table 10) and significantly lower monthly averages (Table 11) than the Rule and Ameristeel monitoring sites**. In July of 2016 Knox County had a Technical Systems Audit (TSA) conducted by EPA Region 4. In this audit it was determined that the lab doing the analysis for KCDAQM was not using an approved equivalent method. KCDAQM promptly joined the national contract for the analysis for lead in ambient air currently held by Eastern Research Group (ERG). The filter analytical cost doubled as a result. Due to the increased cost of analysis and the low historical design value, KCDAQM is requesting to shut down the Rule (1017) lead monitoring site.

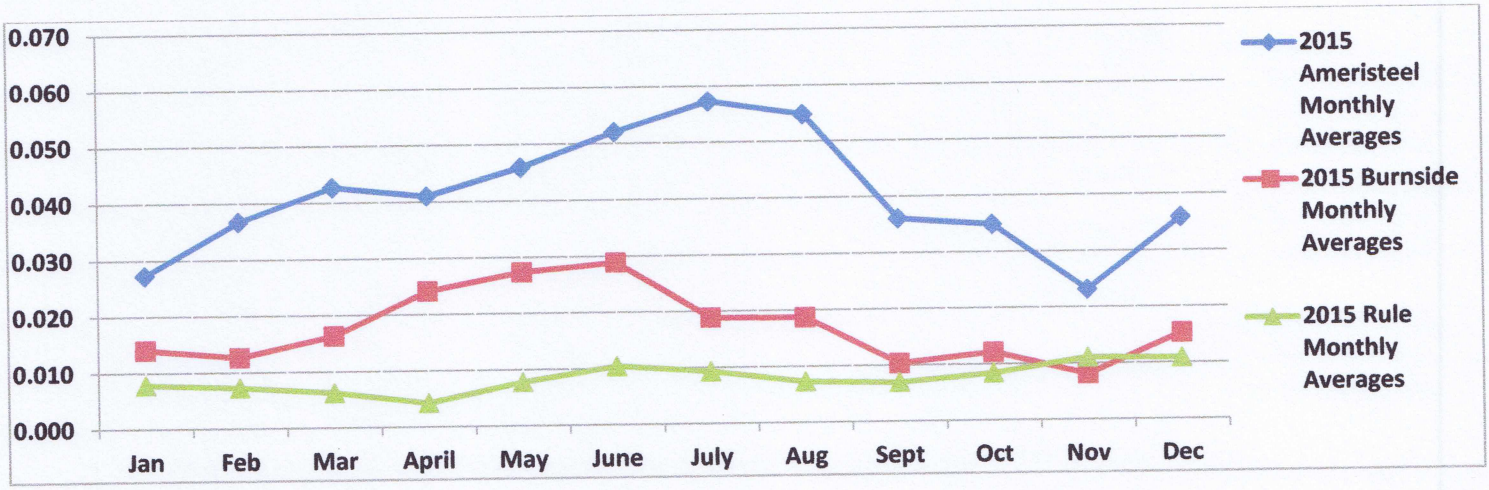
Table 10 - 2013-2016 Lead Design Values by Site

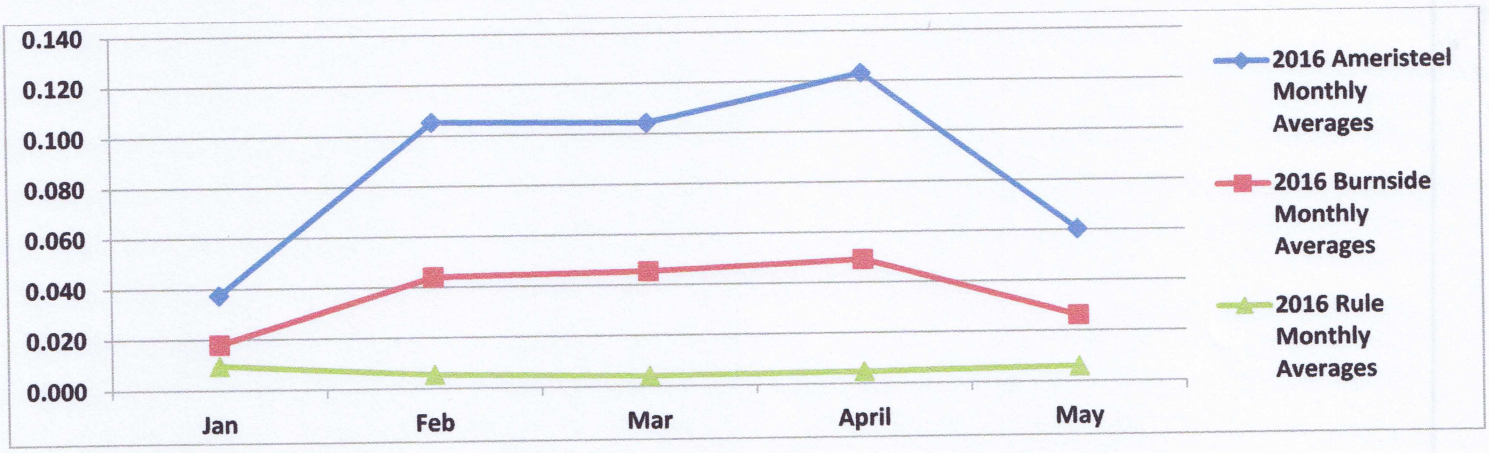
	2013	2014	2015	2016*
Rule	.04 µg/m^3	.03 µg/m^3	.02 µg/m^3	.02 µg/m^3
Burnside	.04 µg/m^3	.03 µg/m^3	.03 µg/m^3	.05 µg/m^3
Ameristeel	.17 µg/m^3	.16 µg/m^3	.11 µg/m^3	.12 µg/m^3

*Incomplete year of data (January-May)

Table 11 - 2014-2016 Monthly Averages by Site

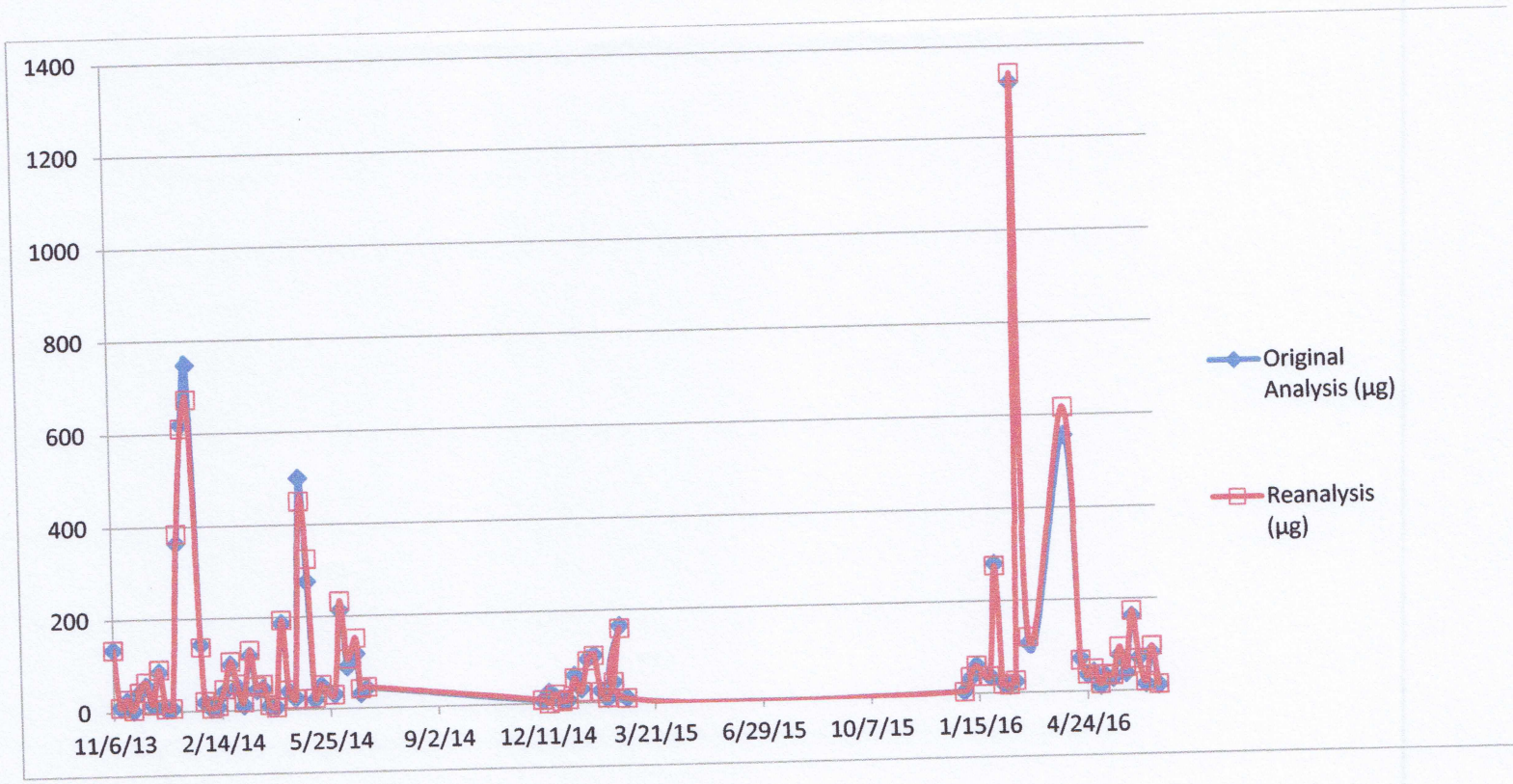






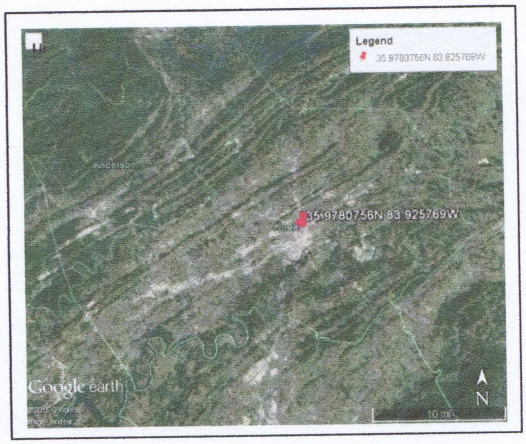
**This data was compiled using data from KCDAQM's original lead laboratory utilizing a method that was not EPA approved. KCDAQM has begun reanalysis of the data at ERG, but data were not completely available at the time of this writing. Table 12 is a line graph of the original analysis and the re-analysis that KCDAQM has results for at this time which proves a strong positive correlation between the data, r=0.996. Though the original data cannot be used for determination of NAAQS compliance, KCDAQM believes there is a strong enough correlation between the original and reanalyzed data to demonstrate a low design value and monthly averages from the Rule site.

Table 12- Original Lead Analysis vs. Re-Analysis



Air Lab , Knox County

Site Photo



Rep Org Name	Knox County Department of Air Quality Management		
PQAO	0581		
Address	939 Stewart St, Knoxville 37917		
AQSID	470931013		
County	Knox		
CBSA	28940		
Lat	35.980756N		
Lon	83.925769W		
Pollutanat	PM 2.5	PM 10	PM 2.5
Parameter Code	88101	81102	81102
Monitor Type	SLAMS	SPM	SPM
POC	1	3	3
Int	7	1	1
Collection Frequency	6	Hourly	Hourly
Method	145	719	
FRM/FEM Monitoring Instrument	Thermo Partisol Plus 2025	Thermo 1405 TEOM	Beta 5014 i
Analysis	Gravimetric	Gravimetric	Gravimetric
Ref Mtd ID	RFPS-0498-118	EQPM-0609-182	
Monitor Objective Type	Population Exposure	Population Exposure	Population Exposure
Dominant Source	Mobile	Mobile	Mobile
Measurment Scale	Middle Scale	Middle Scale	Middle Scale
Land Use Type	Mobile	Mobile	Mobile
Location Setting	Urband and City Center	Urban and City Center	Urban and City Center
Date Established	20110101	20100101	20150701

Site Background and Discussion

The Air Lab site is located in the city of Knoxville in a mixed use zoning area. It is surrounded by residential and commercial facilities. This site was relocated in 2015 from Davanna Ave. A Beta Attenuated Monitor was added as a special purpose monitor for reporting the Air Quality Index (AQI). The TEOM 1405 was approved in 2016 to replace the hi-vol monitors.

Air Lab , Knox County, cont.

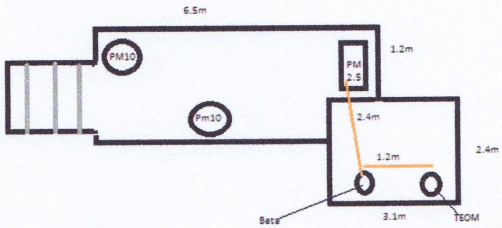
From inlet looking N

From inlet looking S

From inlet looking W

From inlet looking E

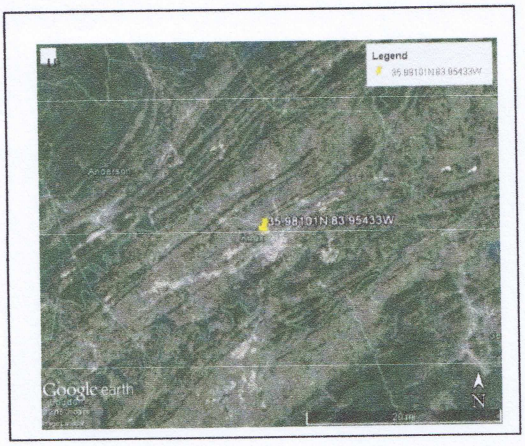
Site Name	Air Lab
Date of Site Evaluation	4/11/2017
Distance to obstruction	n/a
Type of obstruction	none
Height of obstruction	n/a
Height of inlet/probe	Beta: 4.5m, TEOM: 4.2m, PM2.5: 4.6m
Findings	In compliance, fence line growth should be cleared



Site sketch not to scale

Ameristeel, Knox County

Site Photo



Rep Org Name	Knox County Department of Air Quality Management
PQAO	0581
Address	1526 New York Ave, 37921
AQSID	470930023
County	Knox
CBSA	28940
Lat	35.981
Lon	-83.9543
Pollutant	Lead
Parameter Code	14129
Monitor Type	SLAMS
POC	1
Int	7
Collection Frequency	6
Method	107
FRM/FEM Monitoring Instrument	PB-TSP
Analysis	ISPMS Mass Spectroscopy
Ref Mtd ID	RFLA-0813-813
Monitor Objective Type	Source Oriented
Dominant Source	Point
Measurment Scale	Null
Land Use Type	Residential
Location Setting	Urban Center
Date Established	20110101

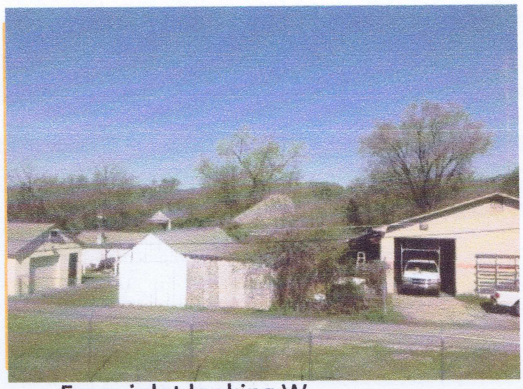
Site Background and Discussion

This is a lead only site established as a source oriented site to fulfill the requirements in 40 CFR part 58 App. D 4.5. It is located in the urban core, down wind of the source.

Ameristeel, Knox County, cont.

From inlet looking N

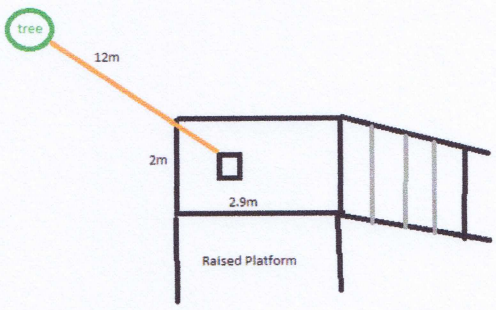
From inlet looking S



From inlet looking W

From inlet looking E

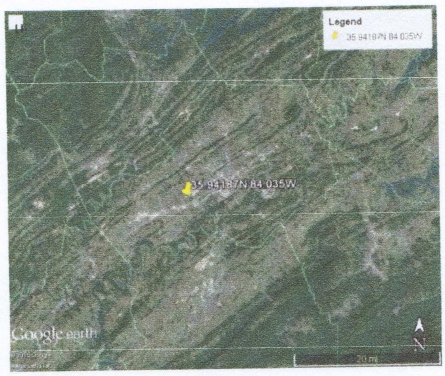
Site Name	Ameristeel
Date of Site Evaluation	4/10/17
Distance to obstruction	12m
Type of obstruction	Tree
Height of obstruction	6.1m
Height of inlet/probe	4.6m
Findings	In compliance, Observe growth, revaluate in 6mths



Site sketch not to scale

Bearden , Knox County

Site Photo



Rep Org Name	Knox County Department of Air Quality Management	
PQAO	0581	
Address	1000 Francis Street, Knoxville, 37909	
AQSID	47090028	
County	Knox	
CBSA	28940	
Lat	35.94190	
Lon	-84.03500	
Pollutant	PM 2.5	PM 2.5
Parameter Code	88101	88101
Monitor Type	SLAMS	SLAMS
POC	1	2
Int	7	7
Collection Frequency	1	6
Method	145	145
FRM/FEM Monitoring Instrument	Thermo Partisol Plus 2025	Thermo Partisol Plus 2025
Analysis	GRAVIMETRIC	GRAVIMETRIC
Ref Mtd ID	RFPS-0498-118	RFPS-0498-118
Monitor Objective Type	Population Exposure	Population Exposure
Dominant Source	Mobile	Mobile
Measurment Scale	Neighborhood	Neighborhood
Land Use Type	Mobile	Mobile
Location Setting	Suburban	Suburban
Date Established	19990101	20110401

Site Background and Discussion

The Bearden site is located west of the urban center of Knoxville in a densely populated area. There are residential and commercial properties for a few kilometers in all directions. This site is centrally located in the Knoxville MSA area.

This Site is important for neighborhood scale population exposure for Knox County and serves as a collocated site.

Bearden , Knox County, cont.

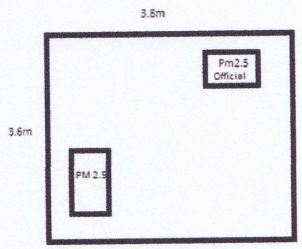
From inlet looking N

From inlet looking S

From inlet looking W

From inlet looking E

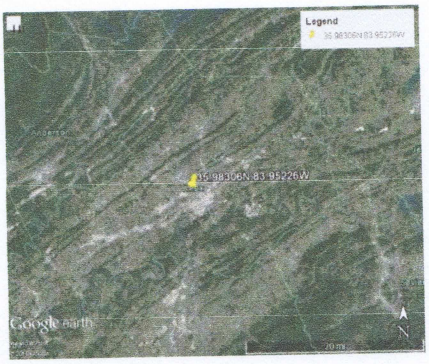
Site Name	Bearden
Date of Site Evaluation	4/10/2017
Distance to obstruction	17.4m
Type of obstruction	treeline
Height of obstruction	n/a
Height of inlet/probe	2.4m
Findings	In compliance; No siting concerns



Site sketch not to scale

Burnside, Knox County

Site Photo



Rep Org Name	Knox County Department of Air Quality Management	
PQAO	0581	
Address	2522 Burnside St, 37921	
AQSID	47090027	
County	Knox	
CBSA	28940	
Lat	35.98306	
Lon	-83.95226	
Pollutant	Lead	Lead
Parameter Code	14129	14129
Monitor Type	SLAMS	SLAMS
POC	1	2
Int	7	7
Collection Frequency	6	6
Method	107	107
FRM/FEM Monitoring Instrument	PB-TSP/ ISPMS	PBTSP/ ISPMS
Analysis	ISPMS Mass Spectroscopy	ISPMS Mass Spectroscopy
Ref Mtd ID	RFLA-0813-813	RFLA-0813-813
Monitor Objective Type	Source Oriented	Collocated
Dominant Source	Point	Point
Measurment Scale	Neighborhood	Neighborhood
Land Use Type	Industrial	Industrial
Location Setting	Urban and City Center	Urban and City Center
Date Established	19941204	19941204

Site Background and Discussion

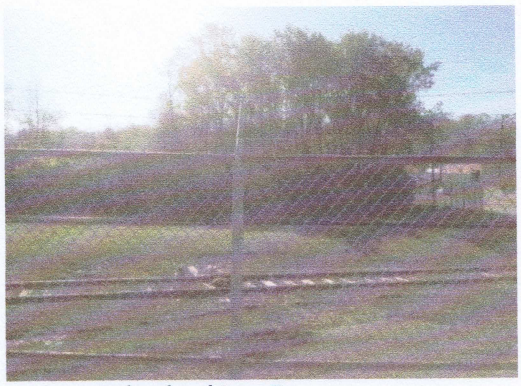
The Burnside site is located in the Urban Industrial section of the city of Knoxville. The site was established in 1994 and serve as a source oriented lead monitor and collocated monitoring site. The Ameristeel Site is now the source oriented monitor and the Burnside site serves as a population exposure site.

Burnside, Knox County, cont.

From inlet looking N

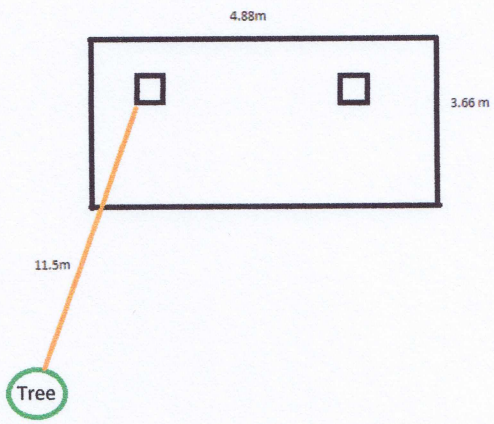
From inlet looking S

From inlet looking W



From inlet looking E

Site Name	Burnside
Date of Site Evaluation	4/10/2017
Distance to obstruction	11.5m to Dripline
Type of obstruction	Tree
Height of obstruction	n/a
Height of inlet/probe	2m
Findings	Tree in SW corner should be trimmed within the year.



Site sketch not to scale

East Knox, Knox County

Site Photo

Rep Org Name	Knox County Department of Air Quality Management
PQAO	0581
Address	9315 Rutledge Pike, Mascot, 37806
AQSID	470930021
County	Knox
CBSA	28940
Lat	36.08564
Lon	-83.76475
Pollutant	Ozone
Parameter Code	44201
Monitor Type	SLAMS
POC	1
Int	1
Collection Frequency	Hourly
Method	087
FRM/FEM Monitoring Instrument	Teledyne 400E
Analysis	Ultra Violet
Ref Mtd ID	EQOA-0992-087047
Monitor Objective Type	Highest Concentration
Dominant Source	Null
Measurment Scale	Urban Scale
Land Use Type	Agricultural
Location Setting	Rural
Date Established	19810601

Site Background and Discussion

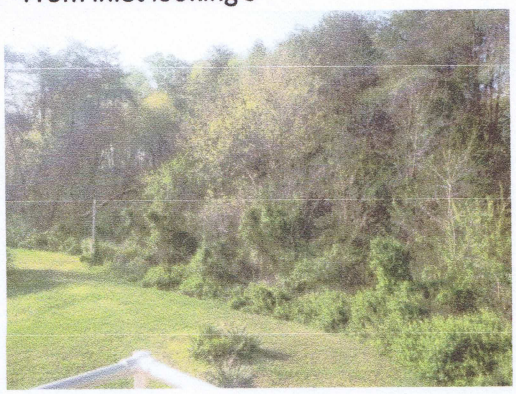
This site is located in East Knox County and currently monitors for ozone. The site was initially established in 1981. The site is located downwind from the core Knoxville MSA area.

This site serves in assessing the highest concentration of ozone in the Knoxville area and used in the AQI forecasting program.

East Knox, Knox County, cont

From inlet looking N

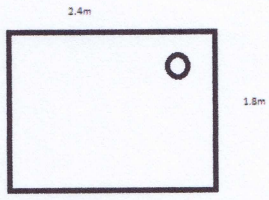
From inlet looking S



From inlet looking W

From inlet looking E

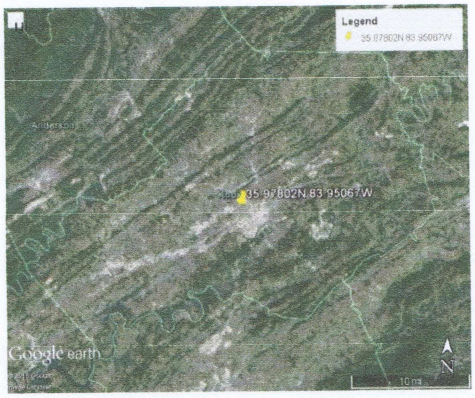
Site Name	East Knox
Date of Site Evaluation	4/11/2017
Distance to obstruction	14.1m to nearest dripline
Type of obstruction	trees
Height of obstruction	n/a
Height of inlet/probe	4.3m
Findings	In compliance ; continue to monitor tree line



Site sketch not to scale

Rule, Knox County

Site Photo



Rep Org Name	Knox County Department of Air Quality Management	
PQAO	0581	
Address	1613 Vermont Ave, Knoxville, 37921	
AQSID	470931017	
County	Knox	
CBSA	28940	
Lat	35.97802	
Lon	-83.95067	
Pollutant	Lead	PM 2.5
Parameter Code	14129	88101
Monitor Type	SLAMS	SLAMS
POC	1	2
Int	7	7
Collection Frequency	6	1
Method	107	145
FRM/FEM Monitoring Instrument	PB-TSP	Thermo Partisol Plus 2025
Analysis	ISPMS Mass Spectroscopy	GRAVIMETRIC
Ref Mtd ID	RFLA-0813-813	RFPS-0498-118
Monitor Objective Type	Population Exposure	Population Exposure
Dominant Source	Null	Mobile
Measurment Scale	Null	Neighborhood
Land Use Type	Residential	Residential
Location Setting	Urban and Center city	Urban and Center city
Date Established	20090101	20020101

Site Background and Discussion

The Rule site serves as a population exposure site for both lead and PM2.5. It is located in a residential area that is less than .5 kilometer SE of several industries.

Rule, Knox County, cont.

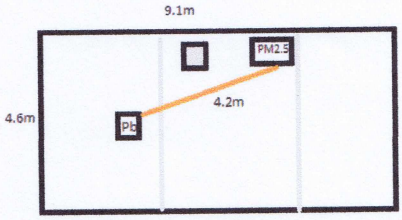
From inlet looking N

From inlet looking S

From inlet looking W

From inlet looking E

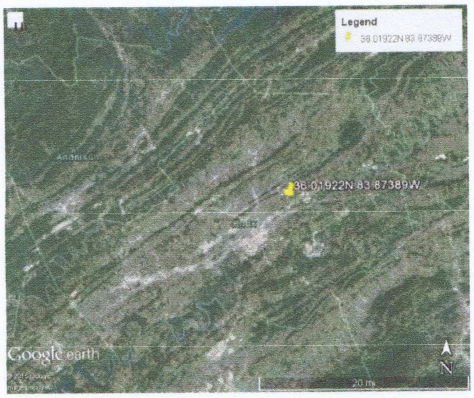
Site Name	Rule
Date of Site Evaluation	4/10/2017
Distance to obstruction	None
Type of obstruction	n/a
Height of obstruction	n/a
Height of inlet/probe	Lead 2m, PM2.5 2.4m
Findings	No siting concerns



Site sketch not to scale

Spring Hill, Knox County

Site Photo



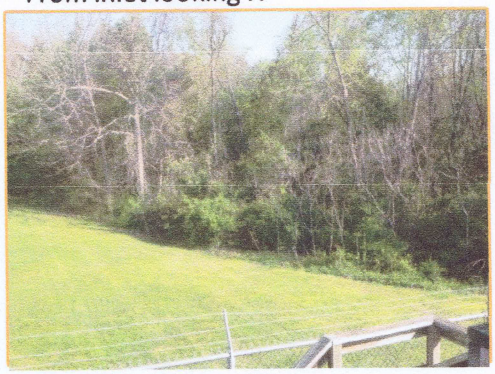
Rep Org Name	Knox County Department of Air Quality Management			
PQAO	0581			
Address	4711 Mildred Drive, Knoxville, 37914			
AQSID	470931020			
County	Knox			
CBSA	28940			
Lat	36.01920			
Lon	-83.87390			
Pollutant	Ozone	PM 2.5	PM 2.5 speciated	
Parameter Code	44201	88101	88502	88502
Monitor Type	SLAMS	SLAMS	Supplemental Speciation	Supplemental Speciation
POC	1	1	5	5
Int	1	7	7	7
Collection Frequency	Hourly	1	6	6
Method	087	145	810	810
FRM/FEM Monitoring Instrument	Teledyne 400E	Thermo Partisol Plus 2025	Met One Super SASS/ URG 3000	URG 3000
Analysis	Ultra Violet	Gravimetric	Gravimetric	Gravimetric
Ref Mtd ID	EQOA-0992-087047	RFPS-0498-118	RFPS-0400-136	RFPS-0400-136
Monitor Objective Type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Dominant Source	Mobile	Mobile	Mobile	Mobile
Measurment Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Land Use Type	Residential	Residential	Residential	Residential
Location Setting	Suburban	Suburban	Suburban	Suburban
Date Established	19810101	19990101		

Site Background and Discussion

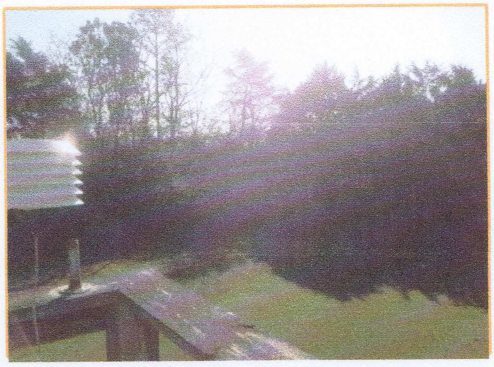
The Springhill site is a neighborhood scale site located downwind of the urban core of Knoxville where ozone precursors are likely to occur. This site provides PM speciation information as well as Ozone and PM 2.5.

Spring Hill, Knox County, cont

From inlet looking N



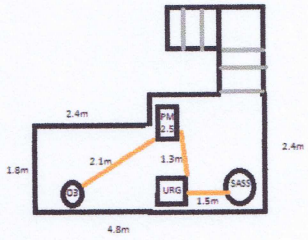
From inlet looking S



From inlet looking W

From inlet looking E

Site Name	Springhill
Date of Site Evaluation	4/11/2017
Distance to obstruction	14m to tree dripline
Type of obstruction	trees
Height of obstruction	n/a
Height of inlet/probe	O3: 4.3m, PM2.5: 4.6m, URG: 4.6m, SASS: 4.4m
Findings	In compliance, continue to monitor treeline



Site sketch not to scale

Appendix A

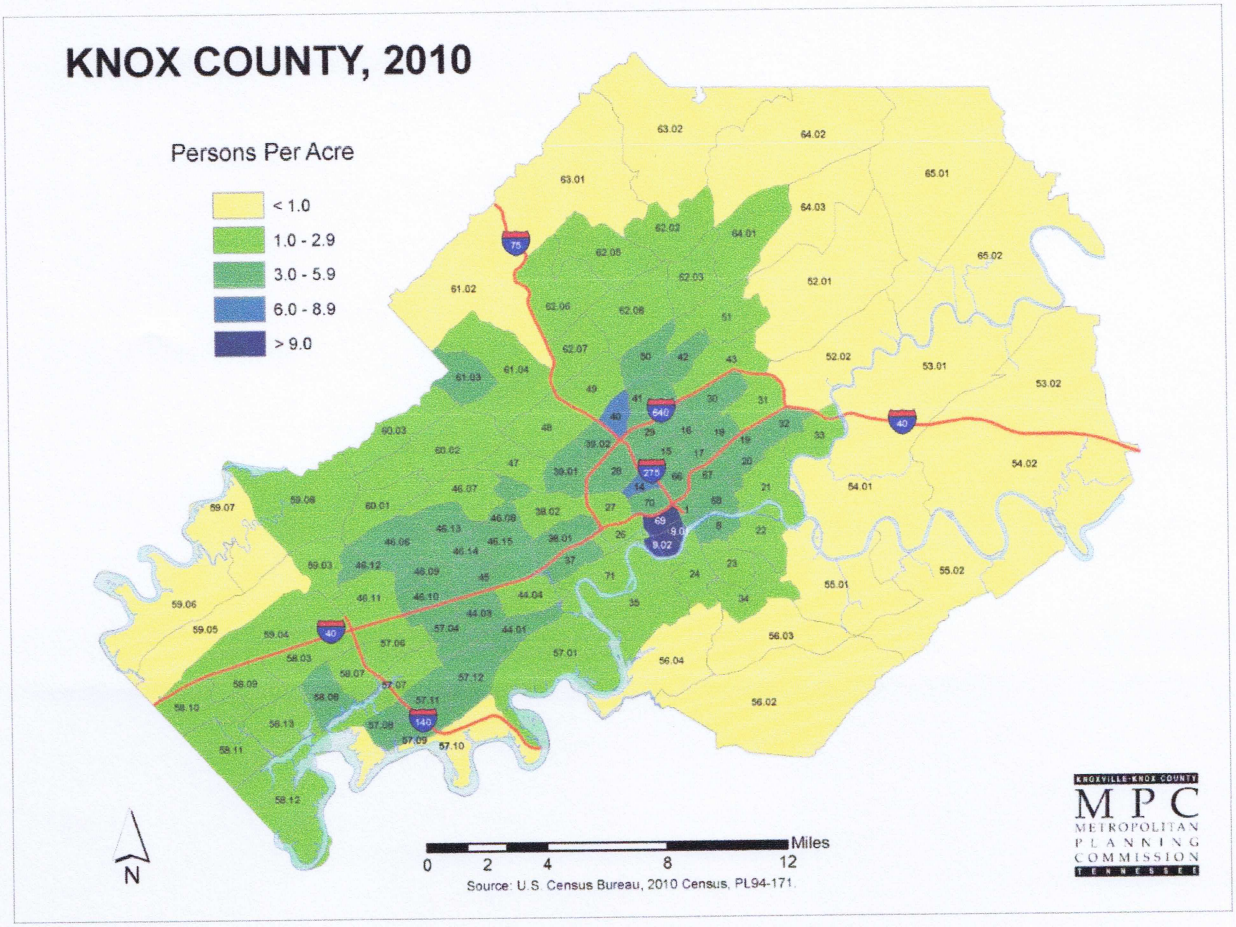
Population Data

The monitoring requirements use both the Metropolitan Statistical Area (MSA) and the Core Based Statistical Area (CBSA) as defined by the Office of Management and Budget. The Knoxville MSA as defined in the 2010 US Census consists of Anderson, Blount, Knox, Loudon and Union Counties. The CBSA for the Knoxville Area consists of Anderson, Blount, Campbell, Grainger, Knox, Loudon, Morgan, Roane and Union Counties. The KCDAQM's monitoring network works together with the State of Tennessee's monitoring network to the serve the population of this metropolitan area. These numbers are used in the calculation of monitors required through the document.

Table A

Geography	Census	Population Estimate (as of July 1)				
		2012	2013	2014	2015	2016
Anderson County, Tennessee	75,129	75,326	75,420	75,347	75,698	75,936
Blount County, Tennessee	123,010	124,069	124,985	126,092	127,142	128,670
Campbell County, Tennessee	40,716	40,460	40,229	39,909	39,728	39,714
Grainger County, Tennessee	22,657	22,649	22,681	22,830	22,835	23,072
Knox County, Tennessee	432,226	440,793	444,325	448,125	451,444	456,132
Loudon County, Tennessee	48,556	49,732	50,374	50,646	50,978	51,454
Morgan County, Tennessee	21,987	21,947	21,707	21,742	21,492	21,554
Roane County, Tennessee	54,181	53,506	53,035	52,773	52,726	52,874
Union County, Tennessee	19,109	19,120	19,055	18,964	19,126	19,140
Knoxville CBSA	837,571	847,602	851,811	856,428	861,169	868,546
Knoxville MSA	698,030	709,040	714,159	719,174	724,388	731,332

1. **2010 population data from the US Census Bureau. www.census.gov**
2. **2012-2016population estimates from the US Census Bureau's Population Estimates Program (PEP).**

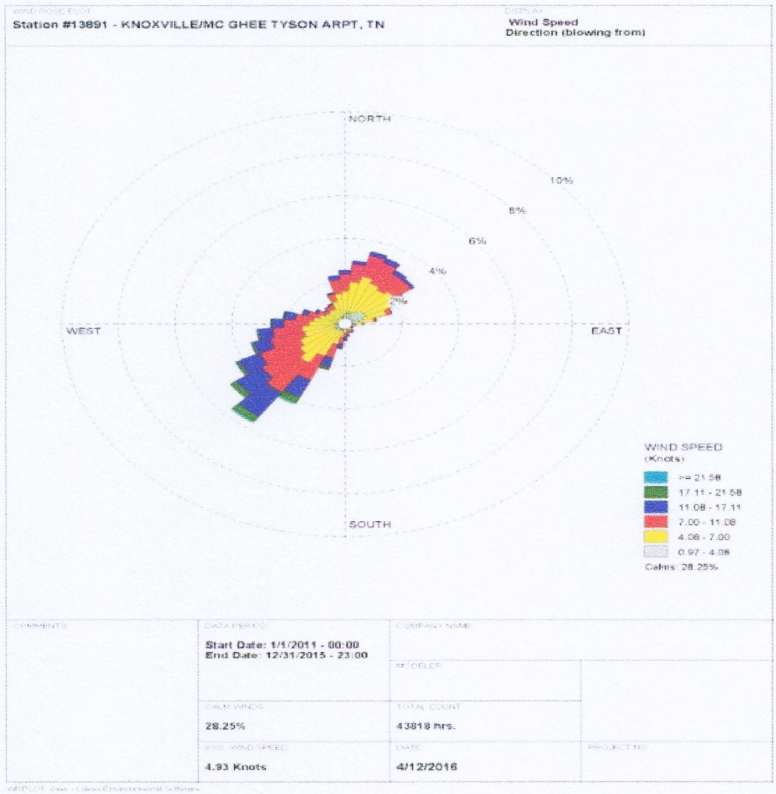

KNOX COUNTY, 2010
Persons Per Acre
< 1.0
1.0 - 2.9
3.0 - 5.9
6.0 - 8.9
> 9.0
N
0 2 4 8 12
Miles
Source: U.S. Census Bureau, 2010 Census, PL94-171.
KNOXVILLE-KNOX COUNTY
MPC
METROPOLITAN PLANNING COMMISSION
TENNESSEE

Appendix B

Climate and Topography:

Knox County is located within the Great East Tennessee Valley. It is paralleled with the plateau to the west and the Great Smoky Mountains to the east. The valley, which is characterized by long, narrow ridges, flanked by broad valleys, has slopes from 1,500 to 700 feet above sea level. The highest peak is 2,064 located in the northeast quadrant. The topography should be considered in monitoring plans due to the influence on inversion events.

Knox County temperatures fall within the humid subtropical climate zone. Temperature variation due to elevation can be apparent between the valley and the surrounding plateau and mountains. In the valley, summers are hot and humid, with the daily average temperature in July at 78.4 F (25.8°C), and an average of 36 days per year with temperatures reaching 90°F (32°C).Winters are generally cool, with occasional small amounts of snow. January has a daily average temperature of 38.2°F (3.4°C) **(NOAA -**http://www.ncdc.noaa.gov/data-access**)**



Wind Rose

The wind rose from 2011-2015 indicates the winds continue to alternate between blowing from the southwest to blowing from the northeast.

Appendix C

Equipment Condition List

	Description	Serial Number	Condition	Put in service	Comments:
Air Lab Site: 47-093-1013					
PM 10 Continuous	TEOM 1405	SN 1405A209531006	Good	2011	
PM 2.5 Sequential	Thermo Partisol Plus 2025	SN B**225760**909	Fair	2010	
Data Logger	ESC 8832	SN A3760K	Good	2010	
PM 10 Hi-Vol	Andersen/GMW	SN P3084	Good	Unknown	No longer in Service
PM 10 Hi-Vol	Andersen/GMW	SN P999	Good	Unknown	No longer in Service
Gast pump (Beta)	75R647-V45-H306X	813944551	Good	2015	
PM 2.5 Continuous	Thermo BAM 5014i	CM14521015	Good	2015	
Rule Site: 47-093-1017					
PM 2.5 Sequential	Thermo Partisol Plus 2026	SN B**26451**005	Good	2012	
TSP Hi-Vol	General Metal Works	SN P1938	Good	Unknown	
Burnside Site: 47-093-0027					
TSP Hi-Vol	General Metal Works	SN P2875	Good	Unknown	
TSP Hi-Vol	Anderson/GMW	SN P04302	Good	Unknown	
Ameristeel Site: 47-093-0023					
TSP Hi-Vol	General Metal Works	SN P04304	Good	Unknown	
Bearden Site: 47-093-0028					
PM 2.5 Sequential	Thermo Partisol Plus 2025	SN B**218930**606	Fair	2007	Collocated Monitor
PM 2.5 Sequential	Thermo Partisol Plus 2025	SN B**218940**606	Fair	2007	
Spring Hill Site: 47-093-1020					
PM 2.5 Sequential	Thermo Partisol Plus 2025	SNB218920606	Fair	2007	
Carbon Sampler	URG 3000N	SN 3N-B0409	Fair	2016	
PM 2.5 Speciation	Met One Super SASS	SN G9188	Fair	2008	
Ozone Analyzer	Teledyne / API 400E	2014	Good	2009	
Ozone Calibrator	Teledyne / API 703E	190	Good	2009	
Data Logger	ESC 8832	A 3758 K	Good	2010	

East Knox Site: 47-093-0021					
Ozone Analyzer	Teledyne / API 400E	2013	Good	2009	
Ozone Calibrator	Teledyne / API 703E	189	Good	2009	
Data Logger	ESC 8832	A 3757 K	Good	2010	
Back-up equipment located at the Air Lab					
PM 2.5 Sequential	Thermo Partisol Plus 2025i	2025IWZ09521601	NEW	2016	Prepping for field
Ozone Analyzer	Teledyne / API 400E	2259	Good	2009	
Ozone Analyzer	Teledyne / API 400E	2697	Poor	2011	Being repaired
Ozone Calibrator	Teledyne / API 703E	188	Good	2009	For Audits
Ozone Calibrator	Teledyne / API 703E	187	Good	2009	Bench Standard
Data Logger	ESC 8832	A 3759 K	Good	2010	
Gist (pump for 0 air)	DOA-P704-AA	0611014883	Good	2011	
Gast (pump for 0 air)	DOA-P704-AA	0611013627	Good	2011	Bench use
PM 2.5 Sequential	Thermo Partisol Plus 2025	SN B**218950**606	Fair	2007	Remote Connection issues
TSP Hi-Vol orifice	General Metal Works	SN P3085	Good	Unknown	loaned to Memphis
Hi-Vol Orifice	Anderson/GMW	P3619	Good	Unknown	
Hi-Vol Orifice	Anderson/GMW	P2861	Good	Unknown	
Hi-Vol Orifice	Anderson/GMW	P4306	Good	Unknown	
Hi-Vol Orifice	Anderson/GMW	P3927	Good	Unknown	loaned to Memphis
PM 10 inlet head for Hi-Vol	Anderson/GMW	3555	Good	Unknown	
PM 10 inlet head for Hi-Vol	Anderson/GMW	3874	Good	Unknown	in mosquito garage
PM 10 inlet head for Hi-Vol	Anderson/GMW	3079	Good	Unknown	in mosquito garage
PM 10 inlet head for Hi-Vol	Anderson/GMW	1536	Poor	Unknown	in mosquito garage
GAST (Pump for 0 Air)	DOA-P704-AA	611014884	Good	2011	For audit use
Discontinued / Out of Service (located at Air Lab)					
PM 2.5 Sequential	Thermo Partisol Plus 2025	SN B**218980**606	Poor	2007	being scavenged
PM 2.5 Sequential	Anderson- RAAS	RAAS2.5-300-00124	Non-Working	N/A	Mostly disassembled
PM 2.5 Sequential	Anderson- RAAS	RAAS2.5-300-00166	Non-Working	N/A	Mostly disassembled

PM 2.5 Sequential	Anderson- RAAS	RAAS2.5-300-00497	Poor	N/A	
PM 2.5 Sequential	Anderson- RAAS	RAAS2.5-300-00137	Non-Working	N/A	Mostly disassembled
PM 2.5 Sequential Speciation	Anderson- RAAS	RAAS2.5-401-00264	Non-Working	N/A	Mostly disassembled
PM 2.5 Sequential Speciation	Anderson- RAAS	RAAS2.5-401-00025	Non-Working	N/A	Mostly disassembled
SO_2 Analyzer	Thermo 43A	43A-39269-262	Unknown	N/A	Loaned to UT
Gas calibrator	Thermo 146	146-45988-275	Unknown	N/A	Loaned to UT
BIOS (Air Pro Sentry II)	SR-24-6-115A	SR 50018	Unknown	N/A	Loaned to UT
BIOS (Air Pro Sentry II)	SR-24-6-115A	SR 50019	Unknown	N/A	Loaned to UT
Ozone analyzer	Thermo 49	49-50547-285	Unknown	N/A	Loaned to UT
Ozone analyzer	Thermo 49	49-29875-237	Unknown	N/A	Loaned to UT
Ozone Calibrator	Thermo 49CPS	49CPS-55290-303	Unknown	N/A	Loaned to UT
Zero Air Supply	ESC 116-7700P	0139	Non-working	N/A	Loaned to UT
Zero Air Supply	ESC 116-7700P	0142	Non-Working	N/A	Loaned to UT
Zero Air Supply	ESC 116-7700P		Unknown	N/A	Loaned to UT

Nashville-Davidson County

Air Monitoring Network Plan 2017

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

Prepared by Tiffany Miesel

04/18/17

Nashville Air Monitoring Network Review 2017

INTRODUCTION

As required by 40 CFR Part 58.10, each monitoring organization must review their network on an annual basis in order to ensure that all requirements within appendices A, B, C, D, and E of Part 58 are being met. Beginning January 1, 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 sections provide 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.

CURRENT AMBIENT AIR MONITORING NETWORK OF NASHVILLE-DAVIDSON COUNTY

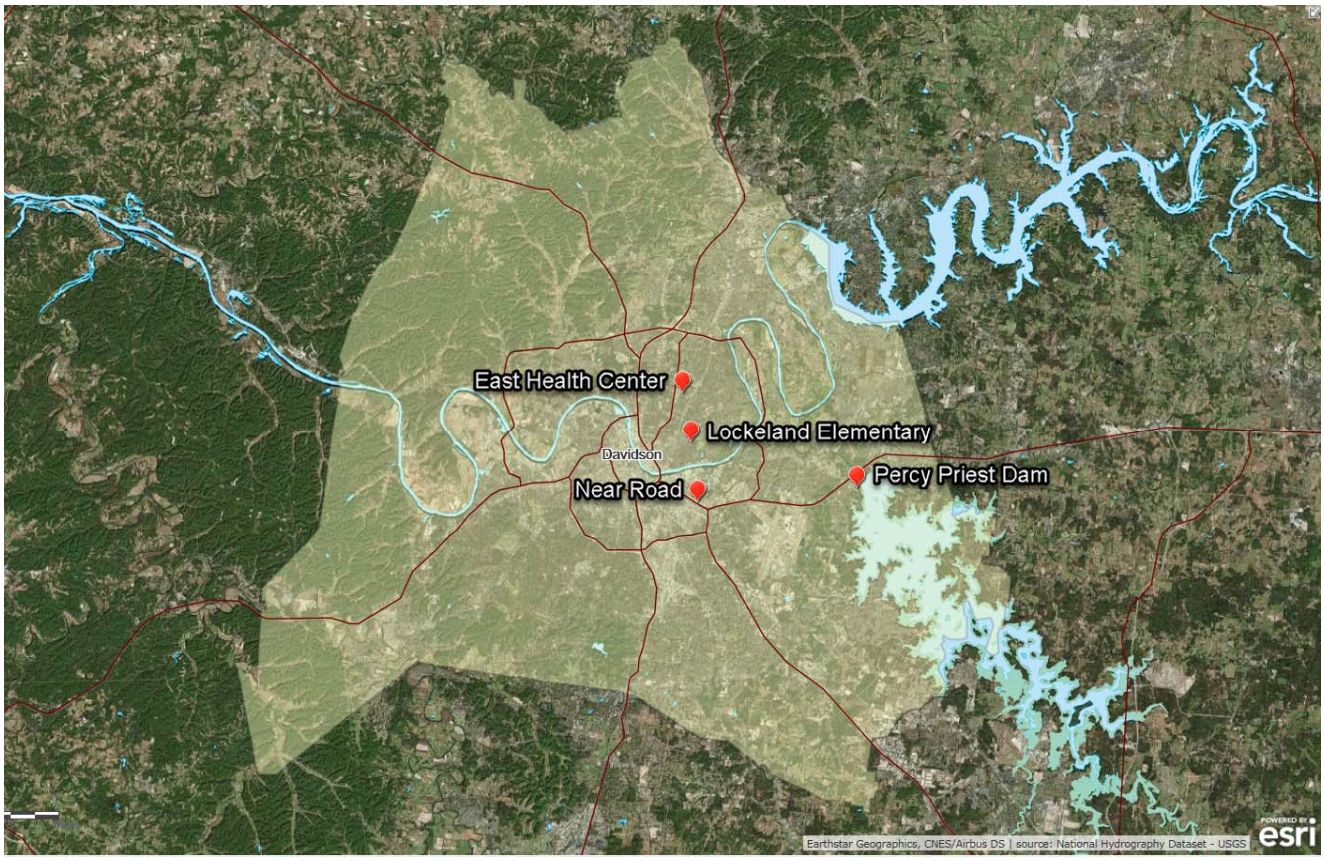
The 2017 Nashville-Davidson County monitoring network had some significant changes made from 2016. In the 2016 network plan, EPA approved the shutdown of two Hi-Vol PM_{10} sites located at Trevecca (47-037-0002) and McCann (47-037-0024), and agreed that starting a continuous PM_{10} monitor at Lockeland Elementary School (47-037-0023) would be an acceptable replacement for PM_{10} monitoring in the CBSA. EPA also approved the transfer of the $PM_{2.5}$ FRM monitor from Hillwood High School (47-037-0036) to the Near Road site (47-037-0040) which would fulfill the near road $PM_{2.5}$ monitoring requirement needed by the start of 2017. Nashville now has 4 sites in operation for 2017: East Health Center which monitors for NO_2, SO_2, and ozone; Lockeland Elementary School which monitors continuous PM_{10}, and both regulatory and AQI specific $PM_{2.5}$; the Percy Priest Dam site which monitors for ozone; and the Near Road site which monitors for CO, NO_2, and $PM_{2.5}$. See the map of Davidson County below for the locations of Nashville's 2017 monitoring network.

For the Nashville-Davidson-Murfreesboro-Franklin CBSA, only one PM_{10} monitor is running at this time. Two PM_{10} monitors are required by 40 CFR Part 58, Appendix D, Section 4.6 for the CBSA but 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 will be reviewed again in the 2020 five year network assessment. For all other pollutants, $PM_{2.5}$, O_3, SO_2, NO_2, and CO, the minimum monitoring requirements of the CFR are being met for the CBSA.

PROPOSED CHANGES TO THE 2017 NASHVILLE-DAVIDSON COUNTY MONITORING NETWORK

There are no plans to change, shutdown, or add any monitors to the current monitoring network.

Davidson County Ambient Air Monitoring Network in 2017



East Health Center - Davidson County, TN

The East Health Center site monitors for ozone, sulfur dioxide, and nitrogen dioxide. This site has been in operation since 1972 and will continue to monitor for these three pollutants in 2017.

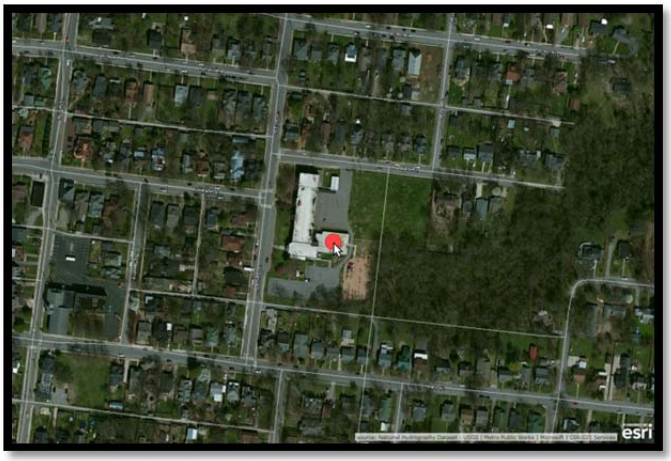
Agency Name (Code)	Metro Public Health Department (0682)		
AQS ID	470370011		
County Name	Davidson		
Address	1015 Trinity Lane		
CBSA	34980		
Latitude, Longitude	36.205000, -86.744722		
Parameter Code	42401	42602	44201
Parameter Name	SO_2	NO_2	O_3
Monitor Type	SLAMS	SLAMS	SLAMS
POC	1	1	1
Duration	1	1	1
Collection Frequency	Hourly	Hourly	Hourly
Method	060	074	047
Monitoring Instrument	Thermo 43i	Thermo 42i	Thermo 49i
Analysis	Pulsed Fluorescent	Chemiluminescence	Photometric
Ref. Method ID	EQSA-0486-060	RFNA-1289-074	EQOA-0880-047
Monitor Objective Type	Population Exposure	Highest Concentration	Population Exposure
Dominant Source	Area	Area	Area
Measurement Scale	Neighborhood	Neighborhood	Neighborhood
Land Use Type	Residential	Residential	Residential
Location Setting	Urban	Urban	Urban
Date Established	3/1/1974	1/6/1975	1/1/1972

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 1/1/1978 and will continue to operate for the 2017 ozone season.

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_3
Monitor Type	SLAMS
POC	1
Duration	1
Collection Frequency	Hourly
Method	047
Monitoring Instrument	Thermo 49i
Analysis	Photometric
Ref. Method ID	EQOA-0880-047
Monitory Objective Type	Highest Concentration
Dominant Source	Area
Measurement Scale	Urban
Land Use Type	Agricultural
Location Setting	Urban
Date Established	1/1/1978

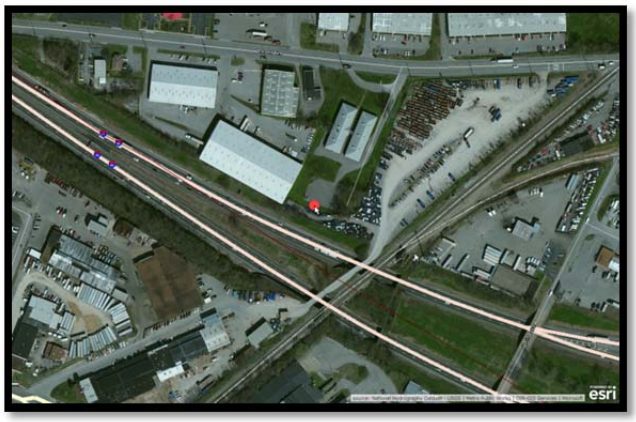
Lockeland Elementary School - Davidson County, TN



The Lockeland Elementary School monitoring site began operation in 1999 and will continue operation in 2017. 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, 2017, a PM_{10} TEOM monitor began operating at this location as the Hi-Vol PM10 monitors at Trevecca and McCann were approved to be shut down by the end of 2016 by EPA.

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	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	PM_{10}
Monitor Type	SLAMS	SLAMS	AQI	SLAMS
POC	1	2	3	2
Duration	7	7	7	1
Collection Frequency	1	6	Hourly	Hourly
Method	145	145	717	079
Monitoring Instrument	Thermo 2025i	Thermo 2025i	Thermo 1405	Thermo 1405
Analysis	Gravimetric	Gravimetric	Gravimetric	Gravimetric
Ref. Method ID	EQPM-0202-145	EQPM-0202-145	AQI only	EQPM-1090-079
Monitor Objective Type	Pop Exposure	Pop Exposure	Pop Exposure	Pop 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

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_2 monitoring requirement. Carbon monoxide and nitrogen dioxide monitors have been in operation since the site began and as of January 1, 2017, a $PM_{2.5}$ FRM monitor is also in operation.

Agency Name (Code)	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	88101
Parameter Name	CO	NO_2	$PM_{2.5}$
Monitor Type	SLAMS	SLAMS	SLAMS
POC	1	1	1
Duration	1	1	7
Collection Frequency	Hourly	Hourly	1
Method	054	074	145
Monitoring Instrument	Thermo 48i-TLE	Thermo 42i-TL	Thermo 2025i
Analysis	Infrared	Chemiluminescence	Gravimetric
Ref. Method ID	RFCA-0981-054	RFCA-1289-074	EQPM-0202-145
Monitor Objective Type	Population Exposure	Population Exposure	Population Exposure
Dominant Source	Area	Area	Area
Measurement Scale	Urban	Urban	Urban
Land Use Type	Industrial	Industrial	Industrial
Location Setting	Urban	Urban	Urban
Date Established	7/1/2014	7/1/2014	1/1/2017

Annual Site Assessments

Each year, siting evaluations are performed in late spring so that an accurate assessment of the tree driplines can be measured once the leaves have grown back. 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.

Site Pollutant	**Date of Evaluation**	**Distance from Inlet to Obstruction (from dripline)**	**Height of Obstruction (above sampler)**	**Type of Obstruction**	**Findings**
East Health Center					
O_3	5/25/2016	20.1m/18.5m	4.5m/16.4m	Two trees	Site OK; trees to the north and east will be monitored
SO_2	5/25/2016	20.1m/18.5m	4.5m/16.4m	Two trees	
NO_2	5/25/2016	20.1m/18.5m	4.5m/16.4m	Two trees	
Percy Priest Dam					
O_3	4/27/2016	41.7m	22.2m	Trees	Site OK; trees to the north will be monitored
Lockeland					
$PM_{2.5}$ - Primary	5/10/2016	--	6.1m	Building	Site OK; building to the west still allows more than 270° of unrestricted airflow
$PM_{2.5}$ - Collocated	5/10/2016	--	6.1m	Building	
$PM_{2.5}$ - TEOM	5/10/2016	--	6.1m	Building	
PM_{10} - TEOM	--	--	6.1m	Building	
Near Road					
NO_2	4/27/2016	18.5m	15.2m	Tree	Site OK; tree to the east will be monitored
CO	4/27/2016	18.5m	15.2m	Tree	
$PM_{2.5}$	--	18.5m	15.2m	Tree	

East Health Center

North

West

East

South

Percy Priest Dam

North

West

East

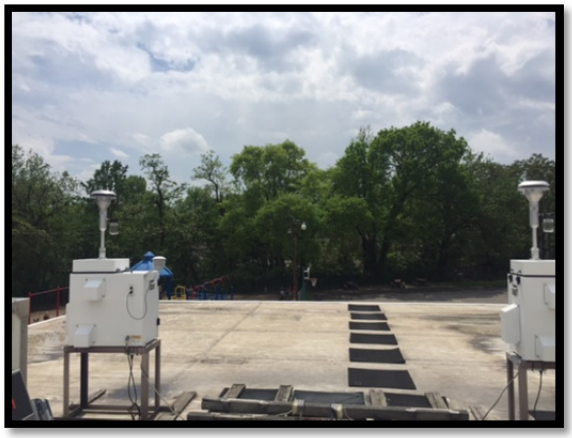
South

Lockeland Elementary School

North

West

East



South

Near Road Site

North

West

East

South

2017 – Annual Evaluation of Ambient Monitors

Date Reviewed April 13, 2017

Site No.	Number of Monitors	Pollutant	Equipment Supplier	Model No. Serial No.	Condition	Years In Service	Monitor Type
470370011	1	SO_2	Thermo	43i s/n 1303156453	Good	3 years	SLAMS
470370011	1	O_3	Thermo	49i s/n CM09130037	Good	6	SLAMS
470370011	1	NO_2	Thermo Instruments	42i s/n 1153030011	Good	4.5	SLAMS
470370011	1	Multi-gas Calibrator	Thermo Instruments	146i s/n 0827732246	Good	6	
470370011	1	Zero Air System	Thermo Instruments	111 s/n 0518112050	Good	6	
470370011	1	UV Photometer	Teledyne	T703 s/n 220	Good	3.5	
470370011	1	Data Logger	Agilaire	8832 s/n A4721K	Good	3.5	
470370040	1	CO	Thermo Instruments	48i-TLE s/n 1324658815	Good	3.5	SLAMS
470370040	1	NO_2	Thermo Instruments	42i-TLE s/n 1324658812	Good	3.5	SLAMS
470370040	1	$PM_{2.5}$	Thermo Instruments	2025i s/n 2025i202281205	Good	4.5	SLAMS
470370040	1	Data Logger	Agilaire	8832 s/n A4689K	Good	3.5	
470370040	1	Multi-gas Calibrator	Thermo Instruments	146i s/n 1324658813	Good	3.5	
470370040	1	Zero Air System	Thermo Instruments	111 s/n 1313057860	Good	3.5	

Site No.	Number of Monitors	Pollutant	Equipment Supplier	Model No. Serial No.	Condition	Years In Service	Monitor Type
470370023	2	$PM_{2.5}$	Thermo Instruments	2025i (POC1) s/n 2025i202161204 (POC2) s/n 2025iW207831504	Good Good	4.5 4.5	SLAMS
470370023	1	$PM_{2.5}$	Thermo	TEOM 1405 s/n 1405A231091503	Good	3	SLAMS
470370023	1	PM_{10}	Thermo	TEOM 1405 s/n 1405A226501311	Good	1	SLAMS
470370023	1	$PM_{2.5}$	Met One	BAM 1022 s/n T23706	Good	1	
470370023	1	Data Logger	Agilaire	8872 s/n 0221	Good	3	
470370026	1	O_3	Thermo Instruments	49i s/n 1322458652	Good	3.5	SLAMS
470370026	1	UV Photometer	Teledyne	703E s/n 296	Good	14	
470370026	1	Zero Air System	Thermo Instruments	111 s/n 0827732247	Good	8	
470370026	1	Data Logger	Agilaire	8832 s/n A2327K	Good	3.5	
AP Lab	1	$PM_{2.5}$	Met One	BAM 1022 s/n U16171	New	0	Back up monitor
AP Lab	1	$PM_{2.5}$	Thermo	TEOM 1405 s/n 1405A238271610	New	0	Back up monitor
AP Lab	1	PM_{10}	Thermo Andersen	GUV-16H s/n 5526	Good	11.5	Out of Service
AP Lab	1	PM_{10}	Thermo Andersen	GUV-16H s/n 5527	Good	11.5	Out of Service
AP Lab	1	$PM_{2.5}$	Thermo Instruments	2025i s/n 2025i202241204	Good	4.5	Back up monitor
AP Lab	1	$PM_{2.5}$	Met One	SASS PM2.5 Speciation s/n G9191	Good	7.5	Out of Service

Site No.	Number of Monitors	Pollutant	Equipment Supplier	Model No. Serial No.	Condition	Years In Service	Monitor Type
AP Lab	1	PM_{10}	Thermo Andersen	GUV-16H s/n 4199	Good	11	Out of Service
AP Lab	1	$PM_{2.5}$	Thermo Instruments	2025 s/n 2025B2 22960806	Good	0	Back up monitor
AP Lab	1	O_3	Thermo Instruments	49i s/n 1322458653	New	0	Back up monitor
AP Lab	1	O_3	Thermo Instruments	49c s/n 0426408745	Good	6.5	Back up monitor
AP Lab	1	O_3	Thermo Instruments	49c s/n 0426408746	Good	6.5	Bench standard
AP Lab	1	Multi-Gas Calibrator	Thermo Instruments	146i s/n 1213752907	Good	3.5	Referee station
AP Lab	1	Zero Air System	Thermo Instruments	111 s/n 1333159730	Good	3.5	Referee station
AP Lab	1	CO	Thermo Instruments	48C s/n 0518112051	Fair	11	In storage; Can be used as backup monitor
AP Lab	1	CO	Thermo Instruments	48C s/n 0518112052	Fair	9	In storage; Can be used as backup monitor
AP Lab	4	Toxics/ Carbonyls	ATEC	2200 s/n 21131 and 21130	Fair	12.5	In Storage
AP Lab	1	PM_{10}	Thermo Andersen	GUV-16H s/n 4204	Good	9	In storage; Back up monitor
AP Lab	1	PM_{10}	Graseby	GMW GUV-16H s/n 3810	Fair	20	In storage; Back up monitor
AP Lab	1	NO_2	Thermo Instruments	42c s/n 0425908744	Fair	11	In storage
AP Lab	1	SO_2	Thermo Instruments	43i s/n JC1324500911	Good	3	Back up monitor
AP Lab	1	Primary Standard	Thermo Instruments	49iPS s/n 1333159739	Good	3.5	Referee station

Site No.	Number of Monitors	Pollutant	Equipment Supplier	Model No. Serial No.	Condition	Years In Service	Monitor Type
AP Lab	1	Data Logger	Agilaire	8872 s/n 0320	New	0	Backup
AP Lab	1	NO_2	Teledyne	T200 s/n 1360	New	0	Backup
AP Lab	1	CO	Teledyne	T300 s/n 1625	New	0	Backup
AP Lab	1	CO	Thermo Instruments	48i s/n 1152990095	New	0	Backup
AP Lab	1	Multi-Gas Calibrator	Teledyne	T750 s/n 61	New	0	PQAO
AP Lab	1	Multi-Gas Calibrator	Environics	6103 s/n 6587	New	0	PQAO

2017 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.

Prepared by:

Judy Low

Supervisor A

April 20th, 2017

Table of Contents

I. Introduction to the 2017 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 Subpart B 58.10. This plan will address the requirements specified in the CFR. 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 2017 Network Plan submitted by the State of Tennessee Department of Environment and Conservation Division of Air Pollution Control.

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_2		42602 NO_2		44201 Ozone			81102 PM_{10} and 85101 Lo Vol		88101 $PM_{2.5}$				88502 $PM_{2.5}$ Speciation		88502 $PM_{2.5}$ Continuous	
CBSA Code	Census 2010 /Est. 2015	CBSA Title (MS Areas)	Operating	Required	Operating	Required	Operating	Required	Operating	Required	Operating	2014-2016 8 Hr. DV	Required	Operating	Required	Operating	2014 -2016 Annual DV $\mu g/m^3$	2014 -2016 24 Hr DV $\mu g/m^3$	Required	Operating	Required	Operating	Required
32820	1324829 / 1344127	Memphis, TN-MS-AR	0	0	2[2,3]	1	1[2]	1	1[1,3,4]	2	3	0.067 Frayser	2	3[5]	2 - 4	3[1]	8.6 Guthrie	18.0 Guthrie	2	1	1	1	1 - 2

[1]The Memphis and 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 40 in the Appendix.

[2] Includes trace level analyzer at Shelby Farms NCORE

[3] Includes trace level analyzer at Southwest Tennessee Community College Near Road Air Monitoring Station

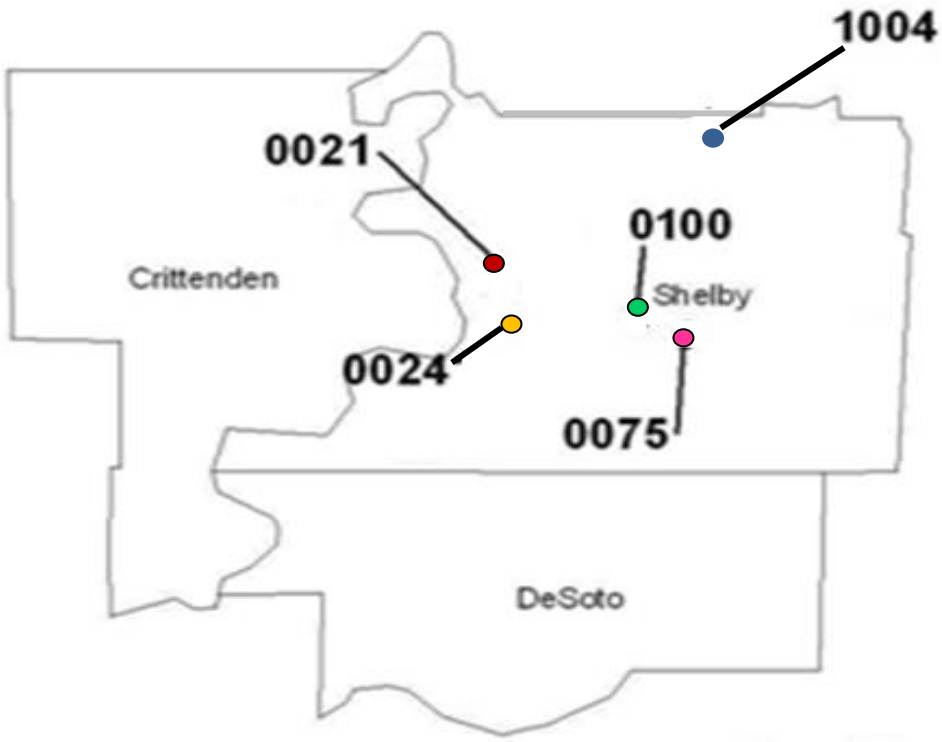
[4] Monitor located in Marion, Arkansas just to the northwest of downtown Memphis.

[5]Includes the low volume PM sampler at Shelby Farms NCORE

Discussions of any proposals to re-locate monitors in the next 18 months and suitability of $PM_{2.5}$ sites for use in comparisons to the annual $PM_{2.5}$ standard:

- The TEOM POC 3 $PM_{2.5}$ particulate monitor and the speciation POC 6 STN monitor are generally not suited to be used for comparisons to the annual $PM_{2.5}$ standards. The TEOM POC 3 $PM_{2.5}$ particulate monitor is used for AQI forecasting purposes.

III. Map of Shelby County Site Locations



Address

0021	1330 Frayser Blvd.
0024	416 Alabama Ave.
0075	6388 Haley Road
0100	5767 Macon Cove
1004	6855 Mudville Rd.

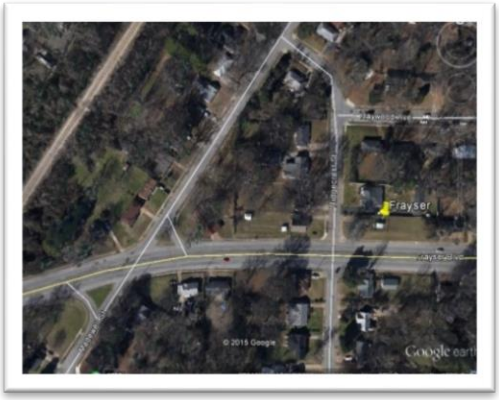
County Boundaries

IV. Shelby County Air Monitoring Sites

(Background, Discussion and Site Evaluation Form)

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

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	2017
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	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 2017 and 2018.

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: 04/10/17 Evaluator: JL/YC

Site Coordinates: LATITUDE 35.217501 LONGITUDE -90.019707

Monitoring Scale: Neighborhood

PARTICULATES						
		$PM_{2.5}$	$PM_{2.5}$ Collocated	PM_{10}	PM_{10} Collocated	TEOM ($PM_{2.5}$)
Probe Height						
Distance to Nearest Road						
Tree Obstruction Height						
Tree Obstruction Distance to dripline						
Other Obstruction Height						

CONTINUOUS						
		CO	NO_2	NOy	O_3	SO_2
Probe Height					3.6 m	
Distance to Nearest Road					16.4 m to Frayser Blvd.	
Tree Obstruction Height					31 m to the nearest tree	
Tree Obstruction Distance to dripline					32 m to the nearest tree	
Other Obstruction Height					N/A	

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

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	88502
Parameter Name	PM 2.5	PM 10
Monitor Type	SLAMS	SLAMS
POC	1	1
Interval	7	1
Year	2017	2017
Collection Frequency	1 in 3	Hourly
Method	118	079
FRM/FEM Monitoring Instrument	Thermo 2025I PM 2.5 Sequential Sampler	Thermo Scientific TEOM 1405 Ambient Particulate Monitor
Analysis	Gravimetric	Gravimetric
Ref. Method ID	RFPS-0498-118	EQPM-1090-079
Monitor Objective Type	Population Exposure	Population Exposure
Dominant Source	Area	Area
Measurement Scale	Neighborhood	Neighborhood
Land Use Type	Residential	Residential
Location Setting	Suburban	Suburban
Date Site Established	20170101	20160403

Site Background and Discussion

The Alabama Ave. site is located in Shelby County, Tennessee and currently supports monitoring for $PM_{2.5}$, PM_{10} and the Radnet program. This site is approximately 25 meters south of Interstate 40 and 50 meters north of apartment complexes.

This site was originally established in 1973 and is expected to operate during CY's 2017 and 2018.

At the beginning of 2017, the $PM_{2.5}$ sampler from Guthrie Clinic was shut down and relocated to the Alabama Station.

Approval was granted to discontinue the CO analyzer at the end of 2016.

Site Evaluation Field Form

SITE NAME: ALABAMA

AQS Site ID: 47-157-0024 Location: 416 Alabama Ave. Date: 04/10/17 Evaluator: JL/YC

Site Coordinates: LATITUDE 35.151194 LONGITUDE -90.041559

Monitoring Scale: Neighborhood

PARTICULATES						
		PM $_{2.5}$	PM $_{2.5}$ Collocated	PM $_{10}$	PM $_{10}$ Collocated	TEOM (PM $_{10}$)
Probe Height		2.0 m		1.5 m		4.6 m
Distance to Nearest Road		7.3 m to Danny Thomas Blvd.		7.3 m to Danny Thomas Blvd.		7.3 m to Danny Thomas Blvd.
Tree Obstruction Height		19 m		19 m		19 m
Tree Obstruction Distance to dripline		10 m to nearest tree		12 m to nearest tree		16 m to nearest tree
Other Obstruction Height		N/A		N/A		N/A

CONTINUOUS						
		CO	NO_2	NOy	O_3	SO_2
Probe Height						
Distance to Nearest Road						
Tree Obstruction Height						
Tree Obstruction Distance to dripline						
Other Obstruction Height						

Are all probes at least 1 meter apart? YES

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

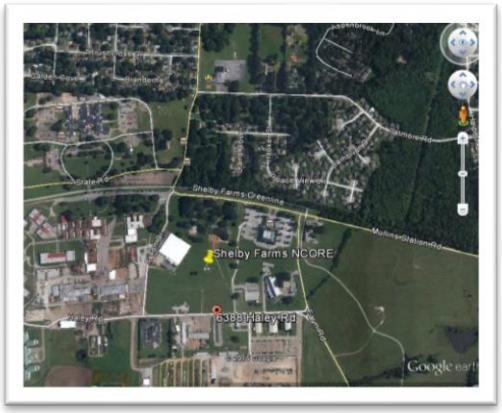
Are all collocated high volume samplers between 2 to 4 meters apart? YES

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 structure? YES

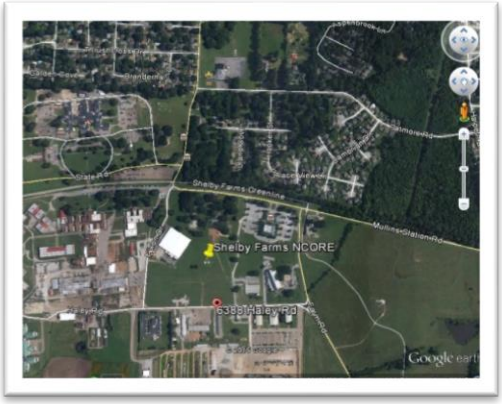
Is there unrestricted air flow 270 degrees around the probe or sampler? YES

C. Shelby Farms NCORE,
ShelbyCounty, TN



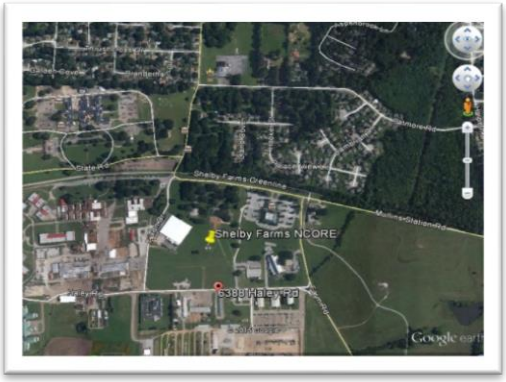
Reporting Org. Name		Memphis/Shelby County Health Dept.	
PQAO			673
Address			6388 Haley Rd.
AQS ID			47-157-0075
County Name			Shelby
CBSA			32820
Latitude			35.151699
Longitude			-89.850249
Parameter Code	42101	42401	42600
Parameter Name	CO (trace)	SO_2 (trace)	NOy
Monitor Type	NCORE (SLAMS)	NCORE (SLAMS)	NCORE (SLAMS)
POC	1	1	1
Interval	1	1	1
Year	2017	2017	2017
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



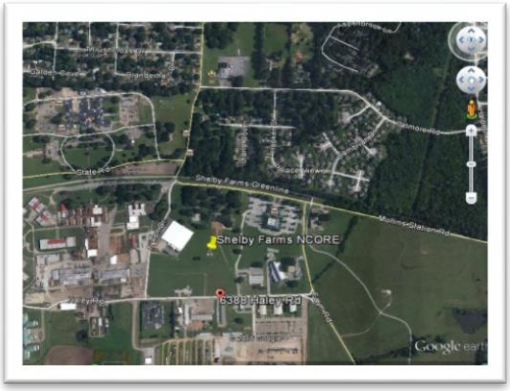
Reporting Org. Name		Memphis/Shelby County Health Dept.	
PQAO			673
Address			6388 Haley Rd.
AQS ID			47-157-0075
County Name			Shelby
CBSA			32820
Latitude			35.151699
Longitude			-89.850249
Parameter Code	44201	61103	61104
Parameter Name	O_3	Wind Speed-Resultant	Wind Direction - Resultant
Monitor Type	NCORE (SLAMS)	NCORE (SLAMS)	NCORE (SLAMS)
POC	1	1	1
Interval	1	1	1
Year	2017	2017	2017
Collection Frequency	Hourly	Hourly	Hourly
Method	087	061	061
FRM/FEM Monitoring Instrument	Teledyne Advanced Pollution Instrumentation, Inc. Models 400E/T400/400/400A	Met One Sonic Anemometer Model 50.5	Met One Sonic Anemometer Model 50.5
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



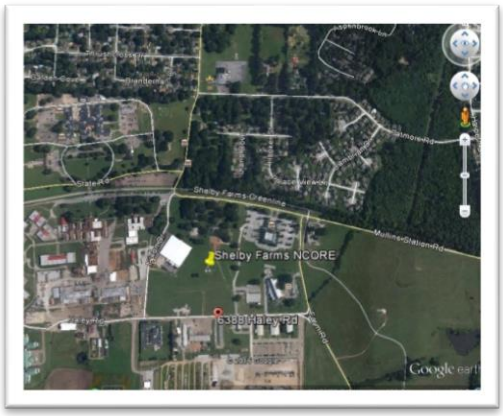
Reporting Org. Name		Memphis/Shelby County Health Dept.	
PQAO			673
Address			6388 Haley Rd.
AQS ID			47-157-0075
County Name			Shelby
CBSA			32820
Latitude			35.151699
Longitude			-89.850249
Parameter Code	62101	62201	64101
Parameter Name	Outdoor Temperature	Relative Humidity	Barometric Pressure
Monitor Type	NCORE (SLAMS)	NCORE (SLAMS)	NCORE (SLAMS)
POC	1	1	1
Interval	1	1	1
Year	2017	2017	2017
Collection Frequency	Hourly	Hourly	Hourly
Method	061	061	014
FRM/FEM Monitoring Instrument	Met One 083D	Met One 083D	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	85101	86101	88101
Parameter Name	PM 10 (low volume)	PM 10-2.5 (course)	PM 2.5
Monitor Type	NCORE (SLAMS)	NCORE (SLAMS)	NCORE (SLAMS)
POC	1	1	1
Interval	7	7	7
Year	2017	2017	2017
Collection Frequency	1 in 3	1 in 3	1 in 3
Method	127	176	118
FRM/FEM Monitoring Instrument	R&P Partisol Plus 2025 Sequential Sampler	R&P Partisol Plus 2025 Sequential Sampler	R&P Partisol Plus 2025 Sequential Sampler
Analysis	Gravimetric	Gravimetric	Gravimetric
Ref. Method ID	RFPS-1298-127	RFPS-0509-176	RFPS-0498-118
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	20120116	20120116	20110223

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	88101	88502	88502
Parameter Name	PM 2.5	PM 2.5continuous	PM 2.5 Speciation
Monitor Type	NCORE (SLAMS)	NCORE (SLAMS)	NCORE (SLAMS)
POC	2	3	6
Interval	7	1	7
Year	2017	2017	2017
Collection Frequency	1 in 6	Hourly	1 in 3
Method	118	711	N/A
FRM/FEM Monitoring Instrument	R&P Partisol Plus 2025 PM 2.5 Sequential Sampler	R&P TEOM Gravimetric 50 degrees Celsius PM 2.5 SSI w/no correction factor	Met One SASS 810/ URG 3000N
Analysis	Gravimetric	TEOM Gravimetric 50 degrees Celsius	Speciation Analysis
Ref. Method ID	RFPS-0498-118	711	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	20160101	20110408	20110208

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, sulfur dioxide (trace), and meteorological data (ambient temperature, barometric pressure, relative humidity, wind direction and wind speed).

Lead monitoring was discontinued on June 29^{th,} 2016 due to changes in Part 58 to the NCORE network design requirement by the EPA. In the new changes, lead monitoring was removed as a requirement as long as 3 years of data had been collected from the site. Lead sampling began January 4, 2012 at the NCORE site.

This site was established in 2011 and is expected to operate in CY's 2017 and 2018.

In the summer of 2019, the Shelby County Air Monitoring Section will be adding PAMS to this site location. This site location will have a NO_2 analyzer and an auto gas chromatograph.

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.

Site Evaluation Field Form

SITE NAME: SHELBY FARMS NCORE

AQS Site ID: 47-157-0075 Location: 6388 Haley Rd. Date: 04/10/17 Evaluator: JL/YC

Site Coordinates: LATITUDE 35.151699 LONGITUDE -89.850249

Monitoring Scale: Neighborhood and Urban Scale

PARTICULATES						
		PM $_{2.5}$	PM $_{2.5}$ Collocated	PM $_{10}$	PM $_{10}$ Collocated	TEOM (PM $_{2.5}$)
Probe Height		2.0 m	2.0 m	2.0 m		4.6 m
Distance to Nearest Road		133 m to Haley Rd.	133 m to Haley Rd.	133 m to Haley Rd.		133 m to Haley Rd.
Tree Obstruction Height		N/A	N/A	N/A		N/A
Tree Obstruction Distance to dripline		88 m to closest tree	87 m to closest tree	89 m to closest tree		80 m to closest tree
Other Obstruction Height		N/A	N/A	N/A		N/A

CONTINUOUS						
		CO	NO_2	NOy	O_3	SO_2
Probe Height		3.8 m		10 m	3.7 m	3.6 m
Distance to Nearest Road		133 m to Haley Rd.		133 m to Haley Rd.	133 m to Haley Rd.	133 m to Haley Rd.
Tree Obstruction Height		N/A		N/A	N/A	N/A
Tree Obstruction Distance to dripline		86 m to closest tree		93 m to closest tree	83 m to closest tree	85 m to closest tree
Other Obstruction Height		N/A		N/A	N/A	N/A

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

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_2 (trace)
Monitor Type	Near Road (SLAMS)	Near Road (SLAMS)
POC	1	1
Interval	1	1
Year	2017	2017
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

Site Background and Discussion

The Near Road Air Monitoring Station is located on the campus of Southwest Tennessee Community College in Shelby County, Tennessee and currently supports monitoring for carbon monoxide (trace), nitrogen dioxide (trace) and $PM_{2.5.}$

At the beginning of the year, $PM_{2.5}$ monitoring was added to the site.

This site was established in 2014 as part of the second phase of the core based statistical area Near Road NO_2 monitoring. This site is expected to operate during CY's 2017 and 2018.

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 2.5
Monitor Type	Near Road (SLAMS)
POC	1
Interval	7
Year	2017
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 Evaluation Field Form

SITE NAME: SOUTHWEST TENNESSEE COMMUNITY COLLEGE NEAR ROAD

AQS Site ID: 47-157-0100 Location: 5787 Macon Cv. Date: 04/10/17 Evaluator: JL/YC

Site Coordinates: LATITUDE 35.161264 LONGITUDE -89.870646

Monitoring Scale: Neighborhood and Urban Scale

PARTICULATES						
		$PM_{2.5}$	**$PM_{2.5}$ Collocated**	**PM_{10}**	**PM_{10} Collocated**	**TEOM ($PM_{2.5}$)**
Probe Height		**4.5 m**				
Distance to Nearest Road		**18.2 m to I-40 East**				
Tree Obstruction Height		**21.0 m**				
Tree Obstruction Distance to dripline		**23.7 m to closest tree**				
Other Obstruction Height		**N/A**				

CONTINUOUS						
		CO	**NO_2**	**NOy**	**O_3**	**SO_2**
Probe Height		**4.2 m**	**4.2 m**			
Distance to Nearest Road		**18.2 m to I-40 East**	**18.2 m to I-40 East**			
Tree Obstruction Height		**21.0 m**	**21.0 m**			
Tree Obstruction Distance to dripline		**23.7 m to closest tree**	**23.7 m to closest tree**			
Other Obstruction Height		**N/A**	**N/A**			

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

G. 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	2017
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	Highest Concentration
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 2017 and 2018.

Site Evaluation Field Form

SITE NAME: EDMUND ORGILL PARK

AQS Site ID: 47-157-1004 Location: 6855 Mudville Rd. Date: 04/10/17 Evaluator: JL/YC
Site Coordinates: LATITUDE 35.161264 LONGITUDE -89.870646

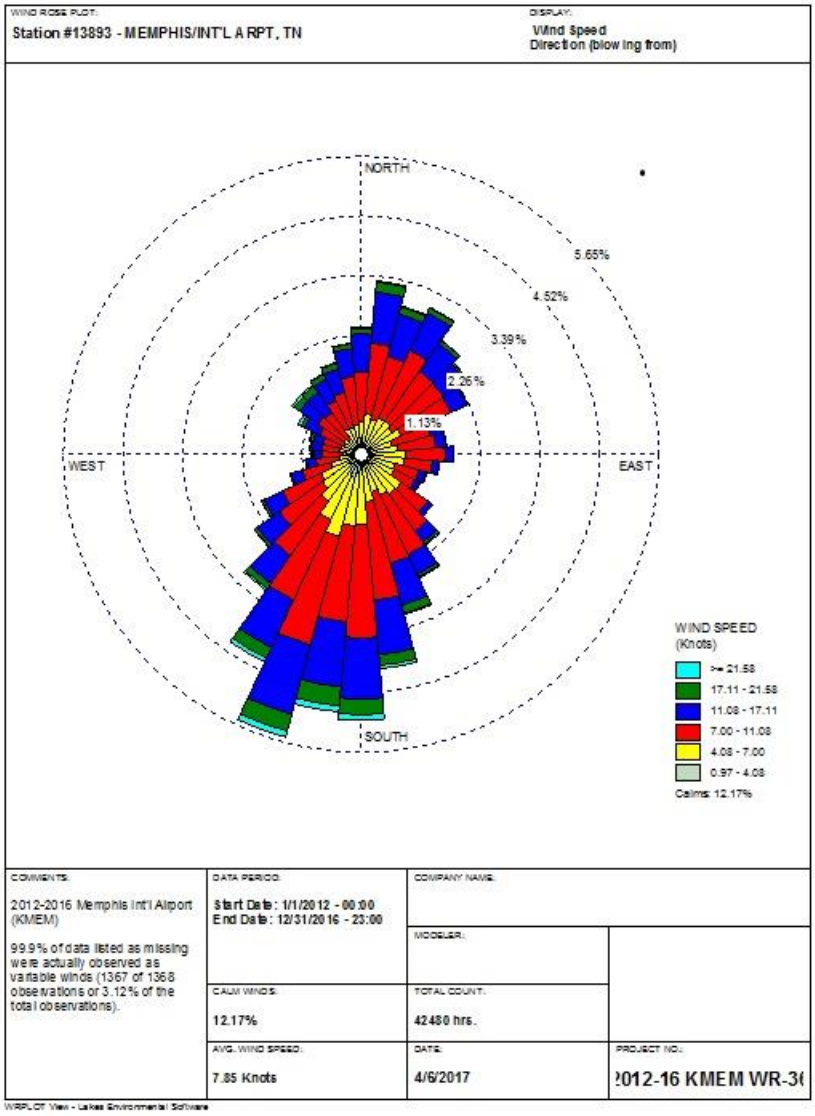
Monitoring Scale: Agricultural

PARTICULATES						
		$PM_{2.5}$	$PM_{2.5}$ Collocated	PM_{10}	PM_{10} Collocated	TEOM ($PM_{2.5}$)
Probe Height						
Distance to Nearest Road						
Tree Obstruction Height						
Tree Obstruction Distance to dripline						
Other Obstruction Height						

CONTINUOUS						
		CO	NO_2	NOy	O_3	SO_2
Probe Height					3.3 m	
Distance to Nearest Road					23.7 m to Mudville Rd.	
Tree Obstruction Height					24.6 m	
Tree Obstruction Distance to dripline					21.9 m to closest tree	
Other Obstruction Height					N/A	

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

V. Shelby County Climatology and Geography



Wind Rose for Memphis, TN-MS-

Shelby County Geography

Shelby County, the largest county in area in Tennessee covers an area of 754.871 square miles or 483,117.44 acres (http://cber.bus.utk.edu/census/cntyarea.pdf). The 2016 population estimate from the U.S. Census for Shelby County is 934,603 (https://www.census.gov/quickfacts/table/PST045215/47157). 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. Cities and towns within Shelby County include Memphis with a population of 655,770; Millington (11,027); Bartlett (58,579); Lakeland (12,553); Arlington (11,625); Collierville (48,863); and Germantown (39,240).

All city population estimates were from the year 2015 (2016 was not available) and were obtained using the QuickFacts Table from http://www.census.gov/

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 (1981-2010) obtained by the National Climatic Data Center, the normal conditions are as follows:

Coldest Month: January (avg max temp=49.8 degrees; avg min temp=31.8 degrees)

Warmest Month: July (avg max temp=91.6 degrees; avg min temp=73.8 degrees)

Yearly Precipitation Normal: 53.68 inches (49.88 inches of rainfall and 3.8 inches of snowfall)

Wettest Months: November-December and March-May (avg of 5.49, 5.74 and 5.16, 5.5, and 5.25 inches, respectively)

Driest Months: August-September (avg of 2.88 and 3.09 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.

VII. Local Programs Submittals of Ambient Monitoring Plan

Memphis AMP

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. Discontinuation of Gas Service Center PM_{10}
   2. Discontinuation of the Alabama Ave. CO analyzer
   3. Relocation of the $PM_{2.5}$ sampler from Guthrie Clinic to the Alabama Station
   4. Discontinuation of the Shelby Farms Lead monitor
   5. Meteorological Waiver Request for a Ceilometer at the PAMS at the Shelby Farms NCore site
B. Shelby County Air Pollution Active Sites 2017
C. 2016 Ambient Monitor and Auxillary Support Equipment Evaluation

A. Memphis Air Monitoring Plan

Shelby County Health Department Air Pollution Control Program

Network Review

2017

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. **Discontinuation of Gas Service Center PM_{10}**

   The Shelby County Health Department's Air Monitoring Branch discontinued PM_{10} sampling at the end of 2016 after EPA approval in the 2016 network plan. The last day of sampling was December 26th, 2016.

2. **Discontinuation of the Alabama Ave. CO analyzer**

   The Shelby County Health Department's Air Monitoring Branch discontinued CO monitoring at the end of 2016 after EPA approval in the 2016 network plan. The last day of sampling was December 31st, 2016.

3. **Relocation of the $PM_{2.5}$ sampler from Guthrie Clinic to the Alabama Station**

   The Shelby County Health Department's Air Monitoring Branch relocated the $PM_{2.5}$ sampler from Guthrie Clinic to the Alabama Station. This was approved in the 2016 network plan. The last day of sampling was December 29th, 2016.

4. **Discontinuation of the Shelby Farms Lead monitor**

   The Shelby County Health Department's Air Monitoring Branch discontinued Lead sampling on June 29, 2016. The changes came about after the EPA eliminated lead monitoring at NCore stations if 3 years of data and no exceedances had been collected from the site.

5. Meteorological Waiver Request for a ceilometer at the PAMS at the Shelby Farms NCore site

The Shelby County Health Department's Air Monitoring Branch is requesting a waiver to allow meteorological measurements for cloud cover and ceiling heights to be obtained from other nearby sites.

The Shelby Farms NCore monitor lies within the city of Memphis and is in close proximity to four ceilometers. Two of the ceilometers are located at ASOS-type observation stations. The Memphis International Airport (KMEM/13893) is the closer of the two ASOS monitors and records the official weather data for Memphis including cloud cover and ceiling heights. It is located 9.9 miles southwest of the Shelby Farms monitor. The second ASOS station is located at the West Memphis, AR Regional Airport (KAWM/53959) 21.5 miles west of the Shelby Farms monitor and also has a ceilometer that records both cloud cover and ceiling heights. The third ceilometer is located at an AWOS III observation station located at the Millington Regional Jetport (KNQA/93839) in Millington, TN 9.9 miles north- northwest of the Shelby Farms monitor. This station also records cloud cover and ceiling heights. The fourth ceilometer is located 11.7 miles southeast of the Shelby Farms monitor at an AWOS III station at the Olive Branch Airport (KOLV/63808) in Olive Branch, MS. As with the other stations, the ceilometer records cloud cover and ceiling heights.

Since the Shelby Farms monitor is located within this large metropolitan area and has several ceilometers that are easily accessible via the internet (all four record hourly observations along with special observation between the hours when needed), the Shelby County Health Department Air Monitoring Branch believes that a waiver should be granted in order to best direct our available funding and resources to areas of greater need.

The Shelby County Health Department Air Monitoring Branch is anticipating on adding PAMS to the NCore site in 2019. The sampling will begin June 2019 thru August 2019. We anticipate on operating a true NO_2 and an auto GC at the site location. The specific types of instrumentation will be determined and included in the 2018 Annual Network Plan.

B. 2017 Shelby County Active Sites

Shelby County Health Department Active Sites	Pollutant	Monitor	AQS ID
416 Alabama	PM 2.5 (1 in 3 day) PM 10 continuous	Thermo Environmental 2025I Sequential and TEOM 1405	47-157-0024
6855 Mudville (Edmund Orgill Park)	O_3 Continuous	Teledyne API	47-157-1004
1330 Frayser	O_3 Continuous	Teledyne API	47-157-0021
6388 Haley Rd.	CO (Trace) Continuous SO_2 (Trace) Continuous NO_Y Continuous O_3 Continuous PM_{10} (lo vol) (1 in 3 day) $PM_{10-2.5}$ (1 in 3 day) $PM_{2.5}$ (1 in 3 day) $PM_{2.5}$ Continuous $PM_{2.5}$ Speciation (1 in 3 day) Carbon (1 in 3 day) Wind Speed Wind Direction Ambient Temperature Relative Humidity Barometric Pressure	Teledyne API Teledyne API Teledyne API Teledyne API R&P 2025 PM 10 R&P 2025 PM 2.5 R&P 2025 PM 2.5 R&P TEOM Met One Super SASS URG 3000 Met One Sonic Anemometer Met One Sonic Anemometer Met One Met One Climatronics Met Sensor	47-157-0075
5767 Haley Rd.	CO (Trace) Continuous NO_2 (Trace) Continuous $PM_{2.5}$ (1 in 3 day)	Teledyne API Teledyne API Thermo Environmental 2025I Sequential	47-157-0100

C. 2016 Ambient Monitor and Auxillary Support Equipment Evaluation

Site	Location	AIRS ID	Make	Model	Serial Number	Condition
Alabama	416 Alabama Ave.	47-157-0024	Met One	SASS	Control Box B1480	Good
Alabama	416 Alabama Ave.	47-157-0024	Met One	SASS	Pump Box B2919	Good
Alabama	416 Alabama Ave.	47-157-0024	Met One	SASS	Sampling Head A7084	Fair
Alabama	416 Alabama Ave.	47-157-0024	Met One	SASS	Sampling Head 1568	Poor
Alabama	416 Alabama Ave.	47-157-0024	Met One	SASS	Radiation Shield K15704	Good
Alabama	416 Alabama Ave.	47-157-0024	URG	3000N	Controller 3N-B0690	Poor
Alabama	416 Alabama Ave.	47-157-0024	URG	3000N	Stand (Pump) 3N-B0630	Good
Alabama	416 Alabama Ave.	47-157-0024	URG	3000N	Module C 3N-B0847	Good
Alabama	416 Alabama Ave.	47-157-0024	ESC	8816	1264	Good
Alabama	416 Alabama Ave.	47-157-0024	ESC	8832	A1571	Good
Alabama	416 Alabama Ave.	47-157-0024	Teledyne API	300E	700	Good
Alabama	416 Alabama Ave.	47-157-0024	Teledyne API	T300	1539	Good
Alabama	416 Alabama Ave.	47-157-0024	Teledyne API	700	487	Good
Alabama	416 Alabama Ave.	47-157-0024	Teledyne API	701	644	Good
Alabama	416 Alabama Ave.	47-157-0024	Teledyne API	300	999	Poor
Alabama	416 Alabama Ave.	47-157-0024	Graseby GMW	PM 10 sampler	2375	Good
Alabama	416 Alabama Ave.	47-157-0024	Measurement Technologies	1001	Asset #921261	Poor
Alabama	416 Alabama Ave.	47-157-0024	Thermo Environmental	1405	1405A223701302	Good
Alabama	416 Alabama Ave.	47-157-0024	General Atomics	Radnet		Good
Alabama	416 Alabama Ave.	47-157-0047	Rupprecht & Pataschnick	2025I	2025IW203531501	Good

Site	Location	AIRS ID	Make	Model	Serial Number	Condition
Edmund Orgill	6855 Mudville Rd.	47-157-1004	Teledyne API	T703	235	Good
Edmund Orgill	6855 Mudville Rd.	47-157-1004	Teledyne API	T400	1138	Good
Edmund Orgill	6855 Mudville Rd.	47-157-1004	Dell	TH845	3V0MV42	Good
Edmund Orgill	6855 Mudville Rd.	47-157-1004	Teledyne API	T703	235	Good
Edmund Orgill	6855 Mudville Rd.	47-157-1004	Teledyne API	T400	1138	Good
Edmund Orgill	6855 Mudville Rd.	47-157-1004	ESC	8832	A1570	Good
Edmund Orgill	6855 Mudville Rd.	47-157-1004	LG	LW1213ER	304CSKJA5637	Good
Edmund Orgill	6855 Mudville Rd.	47-157-1004	Comfort Zone Utility Heater	EH-4601	E200883	Good
Edmund Orgill	6855 Mudville Rd.	47-157-1004	Utility Tech Heater	H-7247	485219	Good
Edmund Orgill	6855 Mudville Rd.	47-157-1004	Cisco Firewall	ASA 5505	JMX1804Z0FB	Good
Frayser	1330 Frayser Blvd.	47-157-0021	Teledyne API	400A	650	Good
Frayser	1330 Frayser Blvd.	47-157-0021	Teledyne API	T703	169	Good
Frayser	1330 Frayser Blvd.	47-157-0021	Teledyne API	T400	1304	Good
Frayser	1330 Frayser Blvd.	47-157-0021	ESC	8832	A1568	Good
Frayser	1330 Frayser Blvd.	47-157-0021	Yokogawa	4182	T4182LA645	Good
Frayser	1330 Frayser Blvd.	47-157-0021	LG	LW1213ER	212TABN01637	Good
Frayser	1330 Frayser Blvd.	47-157-0021	Measurement Technologies	1001		Poor
Frayser	1330 Frayser Blvd.	47-157-0021	Cisco Firewall	ASA5505	JMX16514057	Good
Frayser	1330 Frayser Blvd.	47-157-0021	AT&T Modem	4111N	34111E016403	Good
Frayser	1330 Frayser Blvd.	47-157-0021	Boca Modem	MV 34XX	6946	Good
Frayser	1330 Frayser Blvd.	47-157-0021	Net Gear	GS105	2731093H00416	Good
Frayser	1330 Frayser Blvd.	47-157-0021	Feature Comforts		3068797	Good

Site	Location	AIRS ID	Make	Model	Serial Number	Condition
Frayser	1330 Frayser Blvd.	47-157-0021	Dell	TH844	D8BMV42	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	URG	3000N	Controller 3N-BO742	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	URG	3000N	Module C 3N-B0794	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	URG	3000N	Stand (Pump) 3N-B0592	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Met One	SuperSASS	Control Box K16485	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Met One	SuperSASS	Pump Box K17956	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Met One	SuperSASS	Sample Head K17985	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Sierra Andersen		0240962025U	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Rupprecht & Pataschnick	2025	2025B218020506	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Rupprecht & Pataschnick	2025	2025A209179811	Good

Site	Location	AIRS ID	Make	Model	Serial Number	Condition
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Rupprecht & Pataschnick	2025	2025A209219811	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Kipp & Zonen	BD 300	51518	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	ESC	8832	A-1578	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Teledyne API	400E	2664	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Teledyne API	703E	297	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Teledyne API	701H	80	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Teledyne API	100EU	135	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Teledyne API	300EU	246	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Teledyne API	100E	236	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Teledyne API	200EU	184	Good

Site	Location	AIRS ID	Make	Model	Serial Number	Condition
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Teledyne API	700EU	88	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Teledyne API	701H	1621	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Teledyne API	501Y	145	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Rupprecht & Pataschnick	1400a	140AB231030006	Good
Shelby Farms (NCORE)	6388 Haley	47-157-0075	Meteorological Gear with Crank Tower		T-135	Good
Southwest Tennessee Community College (Near Road Monitoring)	5767 Macon Cove	47-157-0100	Teledyne API	T700U	206	Good
Southwest Tennessee Community College (Near Road Monitoring)	5767 Macon Cove	47-157-0100	Teledyne API	T300U	174	Good
Southwest Tennessee Community College (Near Road Monitoring)	5767 Macon Cove	47-157-0100	Teledyne API	T200U	182	Good

Site	Location	AIRS ID	Make	Model	Serial Number	Condition
Southwest Tennessee Community College (Near Road Monitoring)	5767 Macon Cove	47-157-0100	Teledyne API	701H	809	Good
Southwest Tennessee Community College (Near Road Monitoring)	5767 Macon Cove	47-157-0100	ESC	8832	A4830K	Good
Southwest Tennessee Community College (Near Road Monitoring)	5767 Macon Cove	47-157-0100	Thermo Scientific	2025I	20740	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	T400	631	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	T700	1800	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	401	253-S	Poor
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		ESC	8832	A1567	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Rupprecht & Pataschnick	2025	2025A209189811	Poor
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	401	188	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	700	404	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	401	227	Good

Site	Location	AIRS ID	Make	Model	Serial Number	Condition
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	400	733	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		ESC	8832	A1569	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Environics	6103	3445	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Sartorius		40100003	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Boekel Scientific		124046600	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Troemner	Class 1 Weights	38380	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Vaisala	Humidity/Temp HMP50	UAC1A1A/ F1650007	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Climatronics Omega	100093 / temp sensor	R19750	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Met One	50.5 Sonic Wind Sensor	K13566	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Climatronics	102663 BP Sensor	R23352	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Climatronics	102874 Wind Tunnel Sensor	T12878	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Vaisala	RH sensor	T16788	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Dresser Roots Meter	5M125	8622376	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Dell	Desktop PC / Model DCNE	J7QTGD1	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	701H	113	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	701	1084	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	400A	459	Good

Site	Location	AIRS ID	Make	Model	Serial Number	Condition
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		VWR	Oven 89511-410	41747908	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	T400	1779	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	T200U	104	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	pump pack for T200U	209	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	701H	1622	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Thermo Environmental	2025I	2025IW207391501	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Rupprecht & Pataschnick	2025	2025A209189811	Poor
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Kipp & Zonen	BD300	50519	Poor
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	T750U	55	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Thermo Environmental	2025I	2025IW207371501	Good
Health Dept. Lab	814 Jefferson Ave. (Room 438R)		Teledyne API	T751H	84	Good
Health Dept. Warehouse	3065 Fite Rd.		Beckman Industrial	Circuitmate 9020 20 Mhz Oscilloscope	6090378	Poor
Health Dept. Warehouse	3065 Fite Rd.		Teledyne API	100A	1765	Good
Health Dept. Warehouse	3065 Fite Rd.		Teledyne API	400	299	Poor
Health Dept. Warehouse	3065 Fite Rd.		Teledyne API	401	214	Poor

Site	Location	AIRS ID	Make	Model	Serial Number	Condition
Health Dept. Warehouse	3065 Fite Rd.		ESC	8816	1263	Poor
Health Dept. Warehouse	3065 Fite Rd.		ESC	8816	3458	Poor
Health Dept. Warehouse	3065 Fite Rd.		ESC	8816	1265	Poor
Health Dept. Warehouse	3065 Fite Rd.		ESC	8816	1264	Poor
Health Dept. Warehouse	3065 Fite Rd.		Teledyne API	M701	994	Poor
Health Dept. Warehouse	3065 Fite Rd.		ESC	8816	1266	Poor
Health Dept. Warehouse	3065 Fite Rd.		ESC	8816	1268	Poor
Health Dept. Warehouse	3065 Fite Rd.		Measurement Technologies	1001	7930553	Poor
Health Dept. Warehouse	3065 Fite Rd.		ESC	8816	1267	Poor
Health Dept. Warehouse	3065 Fite Rd.		Teledyne API	701	819	Poor
Health Dept. Warehouse	3065 Fite Rd.		Teledyne API	100A	1656	Poor
Health Dept. Warehouse	3065 Fite Rd.		DuPont Constant Flow Sampler Calibrator	P4000		Poor

Site	Location	AIRS ID	Make	Model	Serial Number	Condition
Health Dept. Warehouse	3065 Fite Rd.		Yokagawa	4182	T4182LA619	Poor
Health Dept. Warehouse	3065 Fite Rd.		Teledyne API	701	819	Poor
Health Dept. Warehouse	3065 Fite Rd.		Rupprecht & Pataschnick	2025	2025A209149811	Poor
Health Dept. Warehouse	3065 Fite Rd.		TSP Hi Vol Sampler			Poor
Health Dept. Warehouse	3065 Fite Rd.		Boeckel Dessicator			Poor
Health Dept. Warehouse	3065 Fite Rd.		Young	Met Gear		Poor
Health Dept. Warehouse	1064 Breedlove		Rupprecht & Pataschnick	2000FRM	20122	Good
Health Dept. Warehouse	1064 Breedlove		Teledyne API	701	644	Poor
Health Dept. Warehouse	1064 Breedlove		Teledyne API	300	609	Poor
Health Dept. Warehouse	1064 Breedlove		Teledyne API	100A	1450	Poor
Health Dept. Warehouse	1064 Breedlove		Teledyne API	200A	415	Poor
Health Dept. Warehouse	1064 Breedlove		Teledyne API	300	123	Poor

Site	Location	AIRS ID	Make	Model	Serial Number	Condition
Health Dept. Warehouse	1064 Breedlove		Teledyne API	701	994	Good
Health Dept. Warehouse	1064 Breedlove		Teledyne API	702	317	Good
Health Dept. Warehouse	1064 Breedlove		Teledyne API	438	438	Good
Health Dept. Warehouse	1064 Breedlove		Dasibi	1008PC	5549	Poor

VIII. Appendix

SHELBY COUNTY HEALTH DEPARTMENT

MARK H. LUTTRELL, JR.
MAYOR

ALISA R. HAUSHALTER, DNP, RN
DIRECTOR

HELEN MORROW, MD, MPA
HEALTH OFFICER

Public Health
Prevent. Promote. Protect.

April 10th, 2017

Mr. Robert Brawner, Environmental Fellow
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

Mr. Jason Stephens, Environmental Manager
Tennessee Department of Environment and Conservation
Air Pollution Control Division
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Mr. Chad LaFontaine, Air Director
Mississippi Department of Environmental Quality
Office of Pollution Control, Air Division
P.O. Box 2261
Jackson, MS 39201

Mr. Stuart Spencer, Chief of the Air Division
Arkansas Department of Environmental Quality
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 Environmental Quality (ADEQ), this letter serves as a notification that changes have been made in our current network. The modifications that were made, approved by the EPA and that took effect for the current network plan are the discontinuation of the CO monitor at the Alabama Station (47-157-0024), the discontinuation of the collocated PM_{10} monitors at the Gas Service Center (47-157-0016), and the relocation of the $PM_{2.5}$ monitor from Guthrie Clinic (47-157-0047) to the Alabama Station (47-157-0024). Also, beginning January 2017, a $PM_{2.5}$ monitor was added to the Near Road monitoring station.

If your agencies do not have current changes to the Network or may be contemplating changes in the near future, please notify the respective agencies of your intentions.

If you have any questions, please call me at (901) 222-9599.

Sincerely,

Robert Rogers, P.E. / Technical Manager
Pollution Control
Shelby County Health Department

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 Environmental Quality (ADEQ)

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 ADEQ 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_{10}), particles of an aerodynamic diameter of 2.5 micrometers and less ($PM_{2.5}$), 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).

PM 2.5 MSA monitoring network include:

County	Federal Referenced Method PM 2.5	Continuous PM 2.5	Speciation PM 2.5	Co located PM 2.5
Shelby County, TN **SCHD**	3 (includes 1 at the Near Road Station)	1	1	1
Crittenden County , AR **ADEQ**	1	1		
DeSoto County, MS **MDEQ**	1	1		1

Criteria Air Pollutant MSA monitoring network include:

County	PM 10	O_3	$NO_x/NO/NO_2$	CO	SO_2
Shelby County, TN **SCHD**	1	3	1 (includes 1 at the Near Road Station)	2 (includes 1 trace at NCORE and 1 trace at the Near Road Station)	1 (trace at NCORE)
Crittenden County , AR **ADEQ**		1	1		
DeSoto County, MS **MDEQ**		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 ADEQ 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 ADEQ, their officers or employees, or any other person. This MOA does not apply to any entity outside SCHD, MDEQ, or ADEQ.

- 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 ADEQ. Each party reserves the right to terminate this MOA. A thirty (30) day written notice must be given prior to the date of termination.