

# Ambient Air Monitoring Plan

2013

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## **Introduction to the 2013 Ambient Air Monitoring Plan for Tennessee**

The State of Tennessee is required to evaluate the ambient air monitoring network each year in accordance with the requirements specified in 40 CFR Subpart B 58.10. The requirements that must be met in the annual evaluation are included as follows:

### **§ 58.10 Annual monitoring network plan and periodic network assessment.**

- (a)
- (1) Beginning July 1, 2007, the State, or where applicable local, agency shall adopt and submit to the Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations including FRM, FEM, and ARM monitors that are part of SLAMS, NCore stations, STN stations, State speciation stations, SPM stations, and/or, in serious, severe and extreme ozone nonattainment areas, PAMS stations, and SPM monitoring stations. The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of this part, where applicable. The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA.
  - (2) Any annual monitoring network plan that proposes SLAMS network modifications including new monitoring sites is subject to the approval of the EPA Regional Administrator, who shall provide opportunity for public comment and shall approve or disapprove the plan and schedule within 120 days. If the State or local agency has already provided a public comment opportunity on its plan and has made no changes subsequent to that comment opportunity, and has submitted the received comments together with the plan, the Regional Administrator is not required to provide a separate opportunity for comment.
  - (3) The plan for establishing required NCore multi-pollutant stations shall be submitted to the Administrator not later than July 1, 2009. The plan shall provide for all required stations to be operational by January 1, 2011.
  - (4) A plan for establishing Pb monitoring sites in accordance with the requirements of appendix D to this part shall be submitted to the EPA Regional Administrator no later than July 1, 2009 as part of the annual network plan required in paragraph (a)(1) of this section. The plan shall provide for the required source-oriented Pb monitoring sites to be operational by January 1, 2010, and for all required non-source-oriented Pb monitoring sites to be operational by January 1, 2011. Specific site locations for the sites to be operational by January 1, 2011 are not required as part of the July 1, 2009 annual network plan, but shall be included in the annual network plan due to be submitted to the EPA Regional Administrator on July 1, 2010.
  - (5) A plan for establishing NO<sub>2</sub> monitoring sites in accordance with the requirements of appendix D to this part shall be submitted to the Administrator by July 1, 2012. The plan shall provide for all required monitoring stations to be operational by January 1, 2013.
  - (6) A plan for establishing SO<sub>2</sub> monitoring sites in accordance with the requirements of appendix D to this part shall be submitted to the EPA Regional Administrator by July 1, 2011 as part of the annual network plan required in paragraph (a) (1). The plan shall provide for all required SO<sub>2</sub> monitoring sites to be operational by January 1, 2013.
- (b) The annual monitoring network plan must contain the following information for each existing and proposed site:
- (1) The AQS site identification number.
  - (2) The location, including street address and geographical coordinates.
  - (3) The sampling and analysis method( s) for each measured parameter.
  - (4) The operating schedules for each monitor.
  - (5) Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal.
  - (6) The monitoring objective and spatial scale of representativeness for each monitor as defined in appendix D to this part.
  - (7) The identification of any sites that are suitable and sites that are not suitable for comparison against the annual PM<sub>2.5</sub> NAAQS as described in § 58.30.

- (8) The MSA, CBSA, CSA or other area represented by the monitor.
  - (9) The designation of any Pb monitors as either source-oriented or non source-oriented according to Appendix D to 40 CFR part 58.
  - (10) Any source-oriented monitors for which a waiver has been requested or granted by the EPA Regional Administrator as allowed for under paragraph 4.5(a)(ii) of Appendix D to 40 CFR part 58.
  - (11) Any source-oriented or non source-oriented site for which a waiver has been requested or granted by the EPA Regional Administrator for the use of Pb-PM10 monitoring in lieu of Pb-TSP monitoring as allowed for under paragraph 2.10 of Appendix C to 40 CFR part 58.
  - (12) The identification of required NO2 monitors as either near-road or area-wide sites in accordance with appendix D, section 4.3 of this part.
- (c) The annual monitoring network plan must document how States and local agencies provide for the review of changes to a PM2.5 monitoring network that impact the location of a violating PM2.5 monitor or the creation/change to a community monitoring zone, including a description of the proposed use of spatial averaging for purposes of making comparisons to the annual PM2.5 NAAQS as set forth in appendix N to part 50 of this chapter. The affected State or local agency must document the process for obtaining public comment and include any comments received through the public notification process within their submitted plan.
- (d) The State, or where applicable local, agency shall perform and submit to the EPA Regional Administrator an assessment of the air quality surveillance system every 5 years to determine, at a minimum, if the network meets the monitoring objectives defined in appendix D to this part, whether new sites are needed, whether existing sites are no longer needed and can be terminated, and whether new technologies are appropriate for incorporation into the ambient air monitoring network. The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma), and, for any sites that are being proposed for discontinuance, the effect on data users other than the agency itself, such as nearby States and Tribes or health effects studies. For PM2.5, the assessment also must identify needed changes to population-oriented sites. The State, or where applicable local, agency must submit a copy of this 5- year assessment, along with a revised annual network plan, to the Regional Administrator. The first assessment is due July 1, 2010.
- (e) All proposed additions and discontinuations of SLAMS monitors in annual monitoring network plans and periodic network assessments are subject to approval according to § 58.14. [71 FR 61298, Oct. 17, 2006, as amended at 72 FR 32210, June 12, 2007; 73 FR 67059, Nov. 12, 2008; 73 FR 77517, Dec. 19, 2008; 75 FR 6534, Feb. 9, 2010]

The draft plan that is presented in the following pages will address each of the requirements specified in the CFR. An overview of the geography, general climate, wind patterns and population trends are included to provide background information that will assist the reader in understanding the current air monitoring network and reasons for placement of the existing monitoring sites. The actual regulatory requirements that specify the number and placement of air monitoring sites is found in 40 CFR 58. The sections that provide this guidance are also included in the report as a reference to help better understand the actual monitoring needs in a given area.

In many instances, the “areas” for which monitoring is required are based on population criteria in which population must be considered to allow for monitoring in the areas where populations may be affected or exposed to the various criteria pollutants of concern. Additional monitoring sites are needed to address areas where source related emission density may be elevated and also impact communities in the same area. Other considerations must also be addressed when selecting and operating air monitoring sites. The local influences of some types of sources (roadway dust or emissions) may be factors that require monitoring sites to be spaced certain distances from those sources or in the case of near-road or roadway monitoring activities, the monitors must be located very close to the potential sources of mobile emissions.

The principal areas in Tennessee with air monitoring sites are depicted with a graphic showing the locations for each of the monitoring sites. The sites are further identified with a site number, an Air Quality Site Identification (AQSID) and the types of pollutants being monitored for at each location. Tables containing the relevant information for each site are also included. The tables are provided in two sections following the location graphic and have been

condensed and combined from the previous year's format so that all relevant information can be found within each area's section of the report and relieves the reader from searching tables at the end of the report for information about a given site.

Each of the four local programs operating an air monitoring network in Tennessee has also provided a separate annual review which has been included in this report. Where revisions were noted in the local networks, similar revisions were added to the state's overall plan.

The recent changes in the NAAQS (National Ambient Air Quality Standards) have resulted in a need to evaluate additional air monitoring in order to comply with the new standards. In some cases; (SO<sub>2</sub> and NO<sub>2</sub>), the revisions to the standard were augmented with revisions to the monitoring requirements. Some of the necessary changes to the monitoring networks have been completed while others are being planned for implementation.

## **Proposed Revisions to Tennessee's Ambient Air Monitoring Network**

### **Sulfur Dioxide Monitoring:**

Based on historical ambient SO<sub>2</sub> data generated in the Kingsport area of Sullivan County, a monitoring site is required in the vicinity of Eastman Chemical Company to assess compliance with the hourly National Ambient Air Quality Standard (NAAQS). A site is already in operation in Kingsport which meets all requirements of 40 CFR, Part 58. It is identified in AQS as 47-163-0007. The site is operated by Eastman Chemical Company and is required under Chapter 1200-03014-.01 of the Tennessee Air Pollution Control regulations. Tennessee Air Pollution Control (TAPC) has received EPA approval to use this site to meet the SO<sub>2</sub> monitoring requirement in Kingsport.

Based on population-weighted emission index calculations, a single SO<sub>2</sub> monitoring site is required in the Core-Based Statistical Areas (CBSA) of Memphis, Nashville, and Knoxville. SO<sub>2</sub> monitoring sites are already in operation in Memphis (AQS 47-157-0075) and Nashville (AQS 47-037-0011) which should satisfy this requirement. To meet the requirement in Knoxville, TAPC has located an SO<sub>2</sub> monitor at its existing ozone monitoring site (47-001-0101 in Anderson County which is in the Knoxville CBSA.

A second SO<sub>2</sub> monitoring site is operated in Shelby County (AQS 47-157-0075) as indicated above. Continued operation of this site allows Memphis-Shelby County Air Pollution Control to meet minimum SO<sub>2</sub> monitoring requirements in the Memphis CBSA.

### **PM-2.5 Monitoring:**

TAPC shut down the speciation monitor at the Clarksville site (AQS 47-125-1009) December 31, 2012 after receiving approval from EPA to do so. No additional changes to the PM<sub>2.5</sub> network are proposed at this time.

### **PM-10 Monitoring:**

TAPC shut down the PM-10 monitoring at its Cleveland site (AQS 47-011-1002) December 31, 2012 after receiving approval from EPA to do so.

Memphis-Shelby County Air Pollution Control proposes to discontinue PM-10 monitoring at its Fite Road site, (AQS 47-157-0046). Historical data for this site reveal PM-10 concentrations are very low. The area in which this site is located is prone to flooding which sometimes interferes with access to the site. To meet minimum PM-10 monitoring requirements in the Memphis CBSA, Memphis proposes either it's Alabama Avenue site (AQS 47-157-0024), Frayser Road, (AQS 47-157-021), or Edmund Orgill Park (AQS 47-157-1004) be considered as an alternative to continued monitoring at the Fite Road location.

### **Ozone Monitoring:**

TAPC and the Nashville Air Pollution Control program will operate 5 ozone monitoring sites in the Nashville CBSA during 2013. Sites (AQS 47-037-0011), (AQS 47-037-0026), (AQS 47-165-0007), (AQS 47-187-0106) and (AQS 47-189-0103) will continue to operate with the two remaining sites (AQS 47-165-0101) and (AQS 47-149-0101) shut down effective December 31, 2012 after receiving approval from EPA to do so.

The Chattanooga-Hamilton County Air Pollution Control agency proposes to relocate the ambient ozone monitoring site located at the Eastside Utility District (AQS 47-065-4003). Access to the current site has become a problem due to increased security measures put into place by the utility district. Routine access to the site must be granted by a security guard. This presents problems when the site operator needs immediate access to the site to repair malfunctioning equipment.

A second reason for relocating this site is because the water plant at Eastside is currently undergoing expansion and is no longer a suitable location to monitor for ozone in this area.

### **Nitrogen Dioxide Monitoring:**

#### Community Wide Monitors

Revisions to the NO<sub>2</sub> NAAQS in 2010 require a minimum of one NO<sub>2</sub> monitoring site in any urban area with a population greater than or equal to one million people to assess community-wide concentrations. Therefore, a community-wide site is required in the Memphis and Nashville CBSA's. An NO<sub>2</sub> monitoring site that meets the requirements is already in operation in Nashville (AQS 47-037-0011).

In the Memphis CBSA the State of Arkansas currently operates an NO<sub>2</sub> monitor at its Marion site, (AQS 05-035-0005). Memphis-Shelby County Air Pollution Control requests EPA approve this site to meet minimum community-wide NO<sub>2</sub> monitoring requirements in the Memphis CBSA.

#### Near-Road Monitors

Memphis and Nashville are currently scheduled to receive funding during Fiscal year 2013 to establish a single near-road site in their respective CBSA's. In the meantime Tennessee APC and the local air pollution control agencies in Memphis and Nashville are working with the Tennessee Dept. of Transportation (TDOT), to identify acceptable sites and work out details to meet siting requirements.

#### **Lead Monitoring:**

There may be a need to relocate the lead monitoring site located near Gerdau Corporation (AQS 47-093-0023) in Knox County in the coming months. Due to a change in the right-of-way near the current monitoring site, relocation may be necessitated.

## **Tennessee Geographic Regions and Descriptions**

In order to have a more meaningful understanding of its different land patterns and variations, geographers and geologists have divided the State into nine natural regions or physiographic provinces. From west to east (see map of Natural Regions of Tennessee) these are the Mississippi Alluvial Valley, West Tennessee Plain, West Tennessee Uplands, Western Highland Rim, Central Basin, Eastern Highland Rim, Cumberland Plateau, Valley and Ridge, and Unaka Mountains.

### **WEST TENNESSEE PLAIN**

The West Tennessee Plain has an area of 7731 square miles and is the second largest physiograph province in the State. This plain is 45 to 65 miles wide and is bounded on the west by the Chickasaw Bluffs. The eastern boundary follows the drainage divided between the Mississippi River and the Western Valley of the Tennessee River. Eighteen of the State's counties are either completely or partially situated in the West Tennessee Plain. The topography of the West Tennessee Plain is a relatively flat terrain that slopes gently westward to the Mississippi River floodplain. Elevations of 450 feet are found on West Tennessee Plain's eastern side and around 280 feet on the west. Relief in most areas is less than 200 feet.

### **WEST TENNESSEE UPLANDS**

The West Tennessee Uplands, the second smallest physiographic province in the State, occupies an area of 1928 square miles. The drainage divided between the Mississippi and Tennessee Rivers forms the region's western boundary, while the eastern boundary is marked by the Tennessee River. The width of this upland region is 15 to 45 miles and covers parts of seven of the State's counties. Although it is not considered a rugged region, the West Tennessee Uplands has greater relief and contrast than the West Tennessee Plain. Broad expanses of undulating plains are found here. The average elevation of this upland province is 700 feet with relief varying from 100 to 300 feet.

### **HIGHLAND RIM**

The Highland Rim, covering an area of 10,572 square miles, is the largest physiographic province in Tennessee. It extends from the Tennessee River in the west to the western escarpment of the Cumberland Plateau in the east. A large part of the Highland Rim's center has been eroded out by the Cumberland River, forming the large, oval-shaped Central Basin. The presence of Central basin, as well as the Highland Rim being relatively narrow in the State's north and south borders, has led to the dividing of the Highland Rim into western and eastern divisions. The Western Highland Rim is the larger of the two, with an area of 6566 square miles. Together, these divisions account for area in 39 of the State's counties. The Western Highland Rim varies from 25 to 45 miles in width and consists of a rolling terrain heavily dissected by stream erosion. Elevations on the Western Highland Rim's tableland range from 800 to 1000 feet, while relief varies from 100 to 200 feet. The Eastern Highland Rim averages 25 miles in width and has an elevation of 900 to 1100 feet. The topography is comprised of an undulating tableland of low relief with widely scattered hills and knobs.

### **CENTRAL BASIN**

The Central Basin, also known as the Nashville basin, is a larger pear-shaped area occupying much of the geographic center of the State. The area has a total of 5851 square miles, measures 65 miles east to west and 95 miles north to south. With the exception of the valley of the Cumberland River at its northern corners, the central Basin is entirely surrounded by the Highland Rim. Wilson, Rutherford, and Marshall Counties are situated entirely within the Basin; parts of 23 other counties are also found there. Differences in typography have caused the Central Basin to sometime be divided into two different regions. Large areas of the region's

geographic center are known as The Inner Basin. This topography is extremely level and has an average elevation of 650 feet. Relief in most areas is less than 50 feet. Relief in most areas is less than 50 feet. The few hills and knobs that rise above the landscape are commonly less than 100 feet in height. The Outer Basin includes the rest of the province and is comprised of an undulating, hilly type topography. Numerous hills and ridges mark the landscape and are especially prominent at the outer edge. The average elevation in this part of the basin is 750 feet, but may vary as much as 250 feet.

#### CUMBERLAND PLATEAU

Covering an area of 2980 square miles, the Cumberland Plateau is an elevated tableland bounded on the west by the Eastern Highland Rim and on the east by the Valley and Ridge. The greatest width, 75 miles, is near the Kentucky border. At its most southern point in the State, the Cumberland Plateau is about 35 miles in width. Five of the State's counties are entirely within the region, while another 17 counties are situated partially in this area. The Cumberland Plateau's topography varies in different parts of the region. In places, the surface has been cut by stream valleys and precipitous gorges that are 200 to 400 feet deep. The tableland part of the Cumberland Plateau has an average elevation of 1800 feet. The elevations are generally lower in the northern part at 1700 to 1900 feet. Far to the south in Marion and Hamilton Counties, the elevations are somewhat higher, around 2000 to 2100 feet. Relief varies from as little as 100 feet to as much as 400 feet.

#### VALLEY AND RIDGE

The Valley and Ridge covers 7703 square miles and is situated between the Cumberland Plateau to the west and the Unaka Mountains to the east. The width of the region ranges from as much as 70 miles along the Kentucky border to as little as 30 miles near the Georgia State Line. In most places, it averages 45 miles in width. Twenty-seven counties of Tennessee are either completely or partially found in this Valley and Ridge region. The topography of the Valley and Ridge consists of long linear ridges and parallel lowland valleys that trend in a northeast to southwest direction. The ridges usually have high elevations of 1100 to 1500 feet while the adjacent valley floors vary from 700 feet to 1000 feet. The ridges and valleys generally have high elevations in the northern part of the region; they are slightly less elevated to the south.

#### UNAKA MOUNTAINS

Covering an area of 2523 square miles, the Unaka Mountains region is the most eastern physiographic province in Tennessee and extended along its entire eastern border adjacent to North Carolina. The width of the region varies from 5 to 25 miles. Although 13 counties have part of their land area within the region, Johnson County is the only one having all of its area completely within the region. The Unaka Mountains region is known for having the highest and most rugged terrain in Tennessee. Lofty mountainous ridges and peaks, heavily forested and deeply carved by precipitous stream valleys, comprise the topography. The highest point, in both the region and the State, is Clingman's Dome (6643 ft) in Sevier County. In addition to Clingman's Dome, there are 13 other mountain peaks in the Unakas with heights of over 6000 feet and 33 peaks of more than 5000 feet. A very large percentage of those peaks are situated directly on the Tennessee State Line, with the greatest concentration found in Sevier County. Narrow lowland valleys and isolated coves are also a part of the topography of the region. The floors of these topographic features range from 1000 to 2000 feet in elevation.

Excerpt from draft of: Tennessee Division of Geology Bulletin 86, Tennessee Topography, by David D. Starnes (2009). The section is titled "Physiographic Provinces of Tennessee."



## Climate Synopsis for Tennessee

The highly varied topography of Tennessee has a significant impact on the state's climate. The landscape varies generally from west to east, starting with the gently rolling lowlands (200-600' above sea level) in the west, rising to the Highland Rim (600-1000') enclosing the Central Basin, and on up to the Cumberland Plateau (~2000') which trends northeast-southwest across the state in a belt 30-50 miles wide. East of the Plateau is the Great Valley of East Tennessee (elevations ranging from 1500' in the north down to 700' in the south) containing a series of northeast-southwest ridges. The eastern border of the state is dominated by the Great Smoky Mountains, with numerous peaks rising 4000' to 6000' above sea level.

Average annual temperatures across the state range from around 55F to a bit over 60F. Winter mean temperatures are near 35F over most of the state, while summer temperatures average between 75F and 80F. Of course, these general patterns are affected by topography: the higher mountain areas tend to have milder summers as well as colder, more blustery winters. The length of the growing season is also linked to topography: most of the state has a growing season between 180 and 220 days, but this stretches to over 235 days in the lowlands around Memphis and drops to near 130 days in the highest mountains to the east.

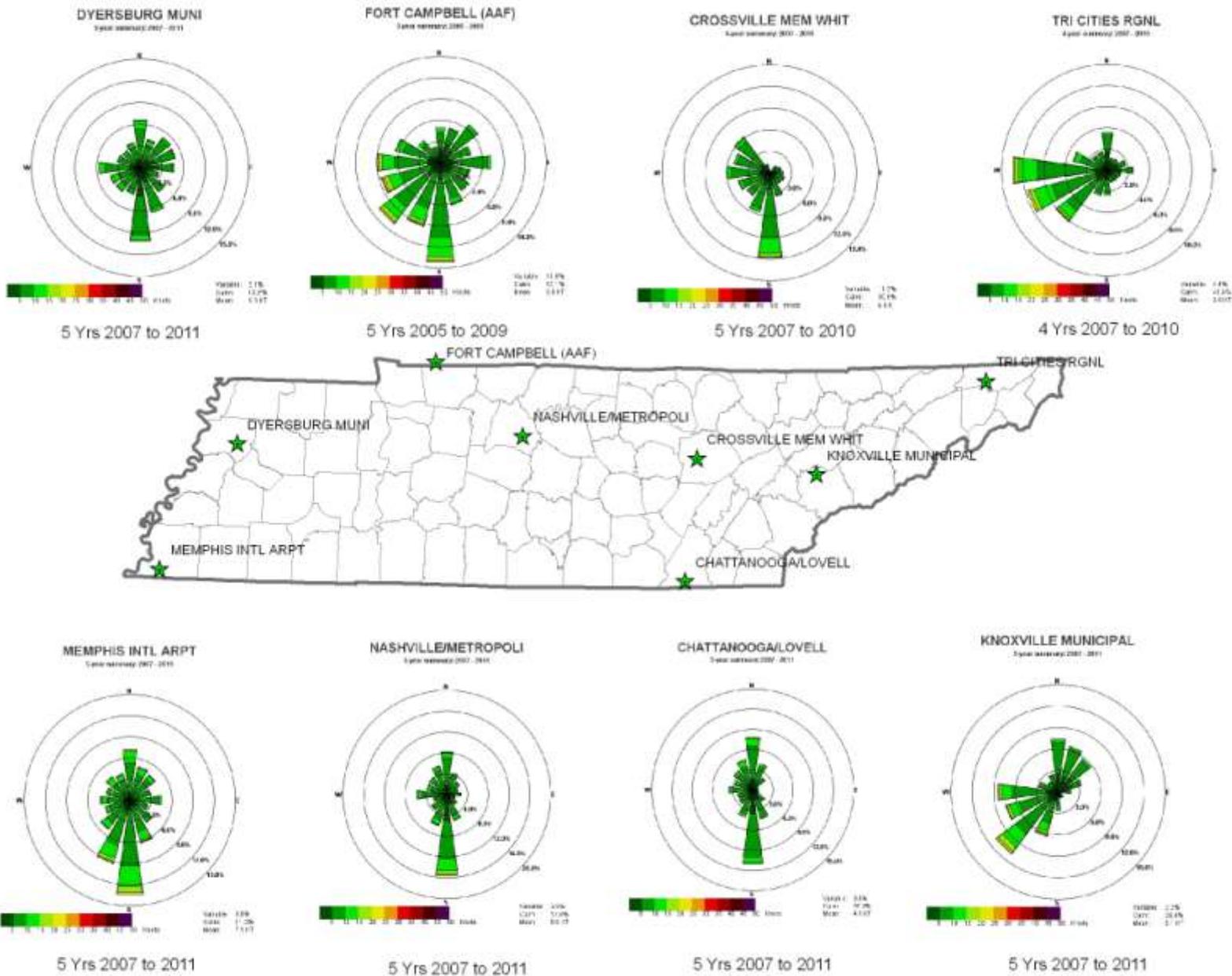
The principal source of moisture for the state is the Gulf of Mexico to the south, which results in a gradual decrease of precipitation from south to north. This gradient is largely obscured, however, by orographic effects. In West Tennessee, annual precipitation amounts range from 46 inches to 54 inches, increasing from the Mississippi bottomlands to the slight hills farther east. In Middle Tennessee, the variation is from around 45 inches in the Central Basin to 50-55 inches in the surrounding Highland Rim. The Cumberland Plateau also averages 50-55 inches per year. In the Great Valley of Eastern Tennessee, annual precipitation rises from a minimum of 40 inches in the north (the driest part of the state due to the rain shadow effect of the Great Smoky Mountains and the Cumberland Plateau) to over 50 inches in the south. The mountainous eastern border of the state is the wettest part, with annual totals of up to 80 inches in the higher, well-exposed peaks.

Over most of the state, the greatest precipitation occurs in winter and early spring owing to the more frequent passage of large-scale (frontal) storms over the region. A secondary maximum of precipitation occurs in midsummer in response to shower and thunderstorm activity, especially in July in the mountains of the east. Fall tends to be the dry season for the state, due to the higher frequency of slow-moving high pressure areas during this season. Average annual snowfall ranges from 4-6 inches in the south and west to over 10 inches in the east. Due to the relatively mild winter conditions over most of the state, snow cover rarely persists for more than a few days.

Severe storms are relatively infrequent in the state, being east of the center of tornado activity, south of most blizzard conditions, and too far inland to be often affected by hurricanes. An average of 11 tornadoes are observed in the state each year, mostly confined to areas west of the Cumberland Plateau. Hailstorms at a given location are observed 2 or 3 times a year, and damaging glaze storms occur in the state every 5 or 6 years. Thunderstorms are frequent in the warm season, and severe thunderstorms with damaging winds are experienced at scattered locations throughout the state each year.

Adapted from: Climatology of the United States, No. 60, National Climatic Data Center

# Windrose Data for Tennessee



## Tennessee Metropolitan and Micropolitan Statistical Areas and Population Data (2010 Census and Estimates to 2012 by US Census Bureau)

Table 1. Annual Estimates of the Population of Metropolitan and Micropolitan Statistical Areas: April 1, 2010 to July 1, 2012								
CBSA Code	Metro Division Code	Type	Geographic area	April 1, 2010		Population estimates (as of July 1)		
				Census	Estimates base	2010	2011	2012
17300		Metropolitan	Clarksville, TN-KY	260625	260625	261868	264625	274342
17420		Metropolitan	Cleveland, TN	115788	115788	115972	116738	117820
27180		Metropolitan	Jackson, TN	130011	130009	130039	129830	130450
27740		Metropolitan	Johnson City, TN	198716	198716	198966	199701	200684
28700		Metropolitan	Kingsport-Bristol-Bristol, TN-VA	309544	309544	309547	308579	309006
28940		Metropolitan	Knoxville, TN	837571	837571	838745	843189	848350
32820		Metropolitan	Memphis, TN-MS-AR	1324829	1324829	1326570	1333390	1341690
34100		Metropolitan	Morristown, TN	113951	113953	114049	114623	114937
34980		Metropolitan	Nashville-Davidson--Murfreesboro--Franklin, TN	1670890	1670890	1675886	1698348	1726693
11940		Micropolitan	Athens, TN	52266	52266	52215	52380	52416
18260		Micropolitan	Cookeville, TN	106042	106049	106284	106381	106860
18900		Micropolitan	Crossville, TN	56053	56053	56217	56618	57029
19420		Micropolitan	Dayton, TN	31809	31809	31852	31961	32247
20540		Micropolitan	Dyersburg, TN	38335	38337	38321	38190	38255
24620		Micropolitan	Greeneville, TN	68831	68831	68806	69079	68819
29980		Micropolitan	Lawrenceburg, TN	41869	41869	42012	42039	42086
30280		Micropolitan	Lewisburg, TN	30617	30617	30659	30872	30883
32280		Micropolitan	Martin, TN	35021	35021	35015	34984	34793
32660		Micropolitan	McMinnville, TN	39839	39839	39846	39909	39839
35460		Micropolitan	Newport, TN	35662	35662	35631	35477	35571
37540		Micropolitan	Paris, TN	32330	32330	32348	32328	32341
42940		Micropolitan	Sevierville, TN	89889	89887	90146	91355	92512
43180		Micropolitan	Shelbyville, TN	45058	45058	45129	45360	45573
46100		Micropolitan	Tullahoma-Manchester, TN	100210	100210	100144	100251	100333
46460		Micropolitan	Union City, TN-KY	38620	38620	38621	38410	37865

Note: The estimates are based on the 2010 Census and reflect changes to the April 1, 2010 population due to the Count Question Resolution program and geographic program revisions. The Office of Management and Budget's statistical area delineations for metropolitan and micropolitan statistical areas, as well as metropolitan divisions, are those issued by that agency in February 2013 <[http://www.whitehouse.gov/omb/infomag\\_statpolicy#ms](http://www.whitehouse.gov/omb/infomag_statpolicy#ms)>.

The metropolitan and micropolitan statistical area population estimates are based upon the county estimates. The county estimates methodology is available at: <<http://www.census.gov/popest/methodology/2012-nat-st-co-meth.pdf>>.

Suggested Citation:

Table 1. Annual Estimates of the Population of Metropolitan and Micropolitan Statistical Areas: April 1, 2010 to July 1, 2012 (CBSA-EST2012-01)

Source: U.S. Census Bureau, Population Division

Release Date: March 2013

# Tennessee County Population Data Trends

Population Estimates					
County	Census (April 1, 2010)	Estimates Base	2010 (July 1)	2011 (July 1)	2012 (July 1)
Anderson	75,129	75,126	75,141	75,208	75,416
Bedford	45,058	45,058	45,129	45,360	45,573
Benton	16,489	16,489	16,483	16,402	16,361
Bledsoe	12,876	12,869	12,862	12,842	12,792
Blount	123,010	123,010	123,138	123,712	124,177
Bradley	98,963	98,963	99,146	99,959	101,134
Campbell	40,716	40,716	40,690	40,573	40,420
Cannon	13,801	13,801	13,800	13,729	13,811
Carroll	28,522	28,522	28,494	28,429	28,390
Carter	57,424	57,424	57,350	57,417	57,355
Cheatham	39,105	39,107	39,107	39,020	39,271
Chester	17,131	17,131	17,163	17,175	17,171
Claiborne	32,213	32,213	32,243	32,083	31,736
Clay	7,861	7,861	7,851	7,829	7,840
Cocke	35,662	35,662	35,631	35,477	35,571
Coffee	52,796	52,796	52,803	52,966	53,222
Crockett	14,586	14,584	14,563	14,533	14,623
Cumberland	56,053	56,053	56,217	56,618	57,029
Davidson	626,681	626,684	628,021	635,592	648,295
Decatur	11,757	11,757	11,737	11,701	11,673
DeKalb	18,723	18,723	18,731	18,803	18,901
Dickson	49,666	49,666	49,737	50,094	50,381
Dyer	38,335	38,337	38,321	38,190	38,255
Fayette	38,413	38,413	38,413	38,539	38,659
Fentress	17,959	17,959	17,934	18,025	17,940
Franklin	41,052	41,052	40,987	40,867	40,772
Gibson	49,683	49,683	49,696	49,865	49,626
Giles	29,485	29,485	29,384	29,339	29,072
Grainger	22,657	22,657	22,714	22,752	22,706
Greene	68,831	68,831	68,806	69,079	68,819
Grundy	13,703	13,708	13,717	13,647	13,650
Hamblen	62,544	62,544	62,611	62,850	62,746
Hamilton	336,463	336,465	337,328	340,870	345,545
Hancock	6,819	6,819	6,826	6,717	6,720
Hardeman	27,253	27,253	27,144	26,839	26,533
Hardin	26,026	26,026	26,031	25,850	25,950
Hawkins	56,833	56,833	56,842	56,643	56,587
Haywood	18,787	18,787	18,749	18,519	18,240
Henderson	27,769	27,769	27,748	28,003	28,023
Henry	32,330	32,330	32,348	32,328	32,341
Hickman	24,690	24,690	24,661	24,353	24,170
Houston	8,426	8,426	8,440	8,326	8,413
Humphreys	18,538	18,538	18,572	18,403	18,275
Jackson	11,638	11,638	11,645	11,450	11,441
Jefferson	51,407	51,409	51,438	51,773	52,191
Johnson	18,244	18,244	18,271	18,204	18,095
Knox	432,226	432,229	433,097	436,877	441,311
Lake	7,832	7,832	7,822	7,771	7,690

Population Estimates					
County	Census (April 1, 2010)	Estimates Base	2010 (July 1)	2011 (July 1)	2012 (July 1)
Lauderdale	27,815	27,815	27,756	27,687	27,718
Lawrence	41,869	41,869	42,012	42,039	42,086
Lewis	12,161	12,161	12,144	12,146	11,896
Lincoln	33,361	33,361	33,433	33,427	33,503
Loudon	48,556	48,556	48,769	49,088	49,793
McMinn	52,266	52,266	52,215	52,380	52,416
McNairy	26,075	26,075	26,063	26,055	26,180
Macon	22,248	22,248	22,263	22,436	22,498
Madison	98,294	98,294	98,313	98,122	98,656
Marion	28,237	28,232	28,243	28,105	28,291
Marshall	30,617	30,617	30,659	30,872	30,883
Maury	80,956	80,956	81,155	81,329	81,990
Meigs	11,753	11,753	11,759	11,662	11,698
Monroe	44,519	44,519	44,602	44,888	45,133
Montgomery	172,331	172,341	173,375	176,837	184,468
Moore	6,362	6,362	6,354	6,418	6,339
Morgan	21,987	21,987	21,973	21,940	21,931
Obion	31,807	31,807	31,802	31,701	31,340
Overton	22,083	22,083	22,101	22,163	22,190
Perry	7,915	7,915	7,928	7,845	7,860
Pickett	5,077	5,077	5,072	5,146	5,100
Polk	16,825	16,825	16,826	16,779	16,686
Putnam	72,321	72,328	72,538	72,768	73,229
Rhea	31,809	31,809	31,852	31,961	32,247
Roane	54,181	54,181	54,128	53,799	53,469
Robertson	66,283	66,283	66,427	66,784	66,931
Rutherford	262,604	262,604	263,779	269,200	274,454
Scott	22,228	22,228	22,246	22,153	22,173
Sequatchie	14,112	14,119	14,120	14,281	14,423
Sevier	89,889	89,887	90,146	91,355	92,512
Shelby	927,644	927,640	928,792	934,405	940,764
Smith	19,166	19,166	19,140	19,147	19,102
Stewart	13,324	13,324	13,340	13,222	13,297
Sullivan	156,823	156,823	156,866	157,032	156,786
Sumner	160,645	160,645	161,289	163,798	166,123
Tipton	61,081	61,081	61,160	61,333	61,705
Trousdale	7,870	7,870	7,861	7,820	7,795
Unicoi	18,313	18,313	18,267	18,277	18,235
Union	19,109	19,109	19,095	19,240	19,127
Van Buren	5,548	5,548	5,539	5,510	5,628
Warren	39,839	39,839	39,846	39,909	39,839
Washington	122,979	122,979	123,349	124,007	125,094
Wayne	17,021	17,021	16,993	17,032	16,996
Weakley	35,021	35,021	35,015	34,984	34,793
White	25,841	25,834	25,840	26,058	26,082
Williamson	183,182	183,180	184,063	188,322	192,911
Wilson	113,993	113,990	114,583	116,724	118,961

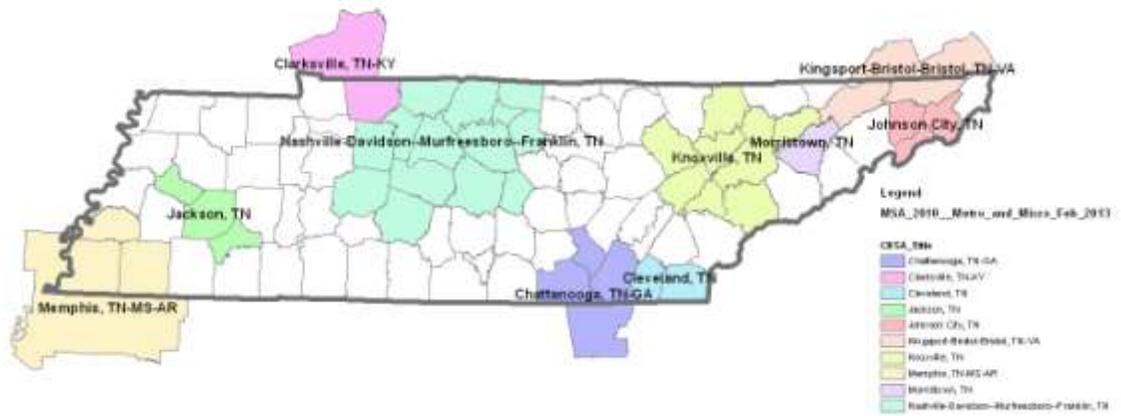
Note: The estimates are based on the 2010 Census and reflect changes to the April 1, 2010 population due to the Count Question Resolution program. See Geographic Terms and Definitions at <http://www.census.gov/popest/about/geo/terms.html> for a list of the states that are included in each region and division. For population estimates methodology statements, see <http://www.census.gov/popest/methodology/index.html>.

Suggested Citation: Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2012

Source: U.S. Census Bureau, Population Division

Release Dates: For the United States, regions, divisions, states, and Puerto Rico Commonwealth, December 2012. For counties and Puerto Rico municipios, March 2013.

## 2010 Metropolitan/Micropolitan Areas of Tennessee



## TAPC Monitoring Equipment Evaluation 2013 AMP

Equipment installed in the field. Equipment evaluation conducted February 2013 to March 2013 by TAPC staff.

Site	Monitor		Chart Recorder		Data Logger		Calibrator		Shelter	
	Model	Condition	Model	Condition	Model	Condition	Model	Condition	Model	Condition
Blountville	ML8810	Good	L&N	Good	ESC 8832	Good	Dasibi 1008PC	Good	T&R 8X20	Good
Blountville	ML8810	Good			ESC 8832	Good				
Kingsport	ML8810	Good	L&N	Good	ESC 8832	Good	Dasibi 1008PC	Good	x	Good
Kingsport					ESC 8832	Good				
Cookeville	R&P 2025	Good					Streamline Pro	Good		
Crab Orchard	TEOM1400a	Good			ESC 8816	Good	Streamline Pro	Good		
Freel's Bend	API 400A	Good	L&N	Good	ESC 8832	Good	Dasibi 1008PC	Good	820	Good
Freel's Bend					ESC 8832	Good (spare)				
Freel's Bend	Teledyne M100E	New	L&N				Teledyne T700	New		
New Market	API 400E	Good	L&N	Good	ESC 8832	Good	Dasibi 1008PC	Good	820	Good
New Market					ESC 8832	Good (spare)				
Loudon Pope	R&P 2025	Good					Streamline Pro			
Loudon Pope	ATEC2200	Good			ESC 8832	Good				Good
Loudon Pope	Vasillia	Good								
Loudon Mid Sch	Teledyne	Good	EA	Good	ESC 8832	Good	Dasibi 1008PC	Good	O D I, Model 818	Good
					ESC 8832	Good (spare)				
Kingsport	R&P 2025	Good					Streamline Pro	Good		
Kingsport	TEOM1400a	Good			ESC 8832	Good				
Bristol	Hivol	Good								
Bristol	Hivol	Good					Kit #9	Good		
Clarksville	TEOM1400a	Good			ESC 8816	Good			432SP	Good
Clarksville	Thermo 2025	Good								

Centerhill	MIC AUC	Good			ESC 8816	Good				
Centerhill	Climatronics 101156-GO	Good								
Cedars of Leb	TEI49C	Good	Westronics 4000	Good	ESC 8816	Good	Dasibi 1008PC	Good	Trailer	Good
Cedars of Leb	OA3502R	Good			ESC 8816	Good				
Cedars of Leb	OA3502R	Good								
Dyersburg	R&P 2025	Good								
Dyersburg	TEOM 1400a	Good			ESC 8816				TEOM 432SP	
Hendersonville	TEI49C	Good	Westronics 4000	Good	ESC 8832	Good	Dasibi 1008PC	Good	Trailer	Good
Hendersonville					ESC 8816	Good (spare)				
Hendersonville	R&P 2025	Good								
Hendersonville	R&P 2025	Good								
Hendersonville	TEOM1400a	Good								
Hendersonville	CSI	Good								
Jackson	R&P 2025	Good								
Jackson	R&P 2025	Good								
Jackson	TEOM1400a	Good			ESC 8816	Good			432SP	Good
Maryville	R&P 2025	Good								
Maryville	TEOM1400a	Good			ESC 8816	Good	Streamline Pro	Good	TEOM 432SP	Good
Meigs	API 400A	Good	L&N	Good	ESC 8816	Good	Dasibi 1008PC	Good	T&R Custom	Good
Meigs					ESC 8832	Good (spare)				
Kingston TVA	TEOM1400a	Good			ESC 8816	Good				Good
Kingston TVA	x	Good								
Cottontown	TEI49C	Good	L&N	Good	ESC 8816	Good	Dasibi 1008PC	Good	x	Good
Fairview	TEI49C	Good	EA	Good	ESC 8832	Good	Dasibi 1008PC	Good	x	Good
Fairview					ESC 8832	Good (spare)				

Eagleville									820	Good
Columbia	R&P 2025	Good					Streamline Pro			
Lawrence	R&P 2025	Good								
Lawrence	URG3000N	Good								
Lawrence	MetOne SASS	Good								
Lawrence	TEOM1400a	Good			ESC 8816	Good	Dasibi 1008PC	Good	x	Good
Lawrence	x		L11013	Good						
Cleveland	Graseby/GM W	Good					x	Good		
Cleveland	Graseby/GM W	Good								
Athens	R&P 2025	Good					Streamline Pro	Good		
Athens	TEOM1400a	Good			ESC 8832	Good			Exto 4325P	Good
Luttrell	TEOM1400a	Good			ESC 8816	Good	Streamline Pro	Good	x	Good
Harriman	R&P 2025	Good								
Harriman	TEOM1400a	Good			ESC 8816	Good			x	Good
Camden	Climatronics Sonic	Good			CS CR200	Good				

Equipment in storage. Equipment evaluation conducted February 2013 to March 2013 by TAPC staff.

Site	Monitor		Chart Recorder		Data Logger		Calibrator		Shelter	
	Model	Condition	Model	Condition	Model	Condition	Model	Condition	Model	Condition
Hatchie Refuge									x	Good
Algood									x	Good
Copperhill									x	Good
Benton Co									x	Good
NJ State Park									x	Good
NFO Storage and QA	ML 9850	Poor	Westronics 4010	Poor	8816	Poor	1008PC	Poor	TEOM	Good

NFO Storage and QA	ML 9850	Poor	Speedomax	Poor	8816	Poor	1008PC	Poor		
NFO Storage and QA	ML 9850	Poor	Speedomax	Poor	8816	Poor	1008PC	Poor		
NFO Storage and QA	ML 9850	Poor	Westronics 4010	Poor	8816	Poor	1008PC	Poor		
NFO Storage and QA	TEOM 1400a	Good	Westronics 4010	Poor	8816	Poor	1008PC	Poor		
NFO Storage and QA	TEOM 1400a	Good	Westronics 4010	Poor	8816	Good	1008PC	Poor		
NFO Storage and QA	TEOM 1400a	Poor		Poor	8832	Good	1008PC	Poor		
NFO Storage and QA	TEOM 1400a	Good	Speedomax	Poor	8832	Good	1008PC	Poor		
NFO Storage and QA	TEOM 1400a	Good			8832	Good	1008PC	Poor		
NFO Storage and QA	TEOM 1400a	Good			8832	Good	1008PC	Poor		
NFO Storage and QA	TEOM 1400a	Poor			8816	Poor	1008PC	Poor		
NFO Storage and QA	TEOM 1400a	Poor			8816	Good	1008PC	Good		
NFO Storage and QA	TEOM 1400a	Poor			8816	Good	1008PC	Good		
NFO Storage and QA	TEOM 1400a	Poor			8816	Good	1008PC	Good		
NFO Storage and QA	MetOne SASS	Poor			8816	Good	1008PC	Good		
NFO Storage and QA	MetOne SASS	Good			8816	Good	1008PC	Poor		
NFO Storage and QA	MetOne SASS	Good			8816	Good	1008PC	Poor		
NFO Storage and QA	MetOne SASS	Good			8816	Good				

NFO Storage and QA	URG3000N	Good			8816	Good	1008PC	Poor		
NFO Storage and QA	MetOne SASS	New					1008PC	Poor		
NFO Storage and QA	R&P 2025	Good					1008PC	Poor		
NFO Storage and QA	R&P 2025	Good					1008PC	Poor		
NFO Storage and QA	R&P 2025	Poor			8000B	Poor	1008PC	Poor		
NFO Storage and QA	R&P 2025	Poor					1008PC	Poor		
NFO Storage and QA	R&P 2025	Poor					Photocal 3000	Poor		
NFO Storage and QA	R&P 2025	Poor					Teledyne 703E	Good		
NFO Storage and QA	R&P 2025	Good					Teledyne 703E	New		
NFO Storage and QA	R&P 2025	Good					Teledyne 703E	Good		
NFO Storage and QA	R&P 2025	Good					Teledyne 703E	Good		
NFO Storage and QA	R&P 2025	Good					Teledyne 703E	New		
NFO Storage and QA	R&P 2025	Poor					Teledyne M100E	New		
NFO Storage and QA	R&P 2025	Good					Teledyne T700	New		
NFO Storage and QA	R&P 2025	Good					Environics 100	Poor		
NFO Storage and QA	R&P 2025	Poor					Environics 100	Poor		
NFO Storage and QA	R&P 2025	Poor					Environics 100	Poor		

NFO Storage and QA	R&P 2025	Good					TEI 146	Poor		
NFO Storage and QA	R&P 2025	Poor					GMW 76-100	Good		
NFO Storage and QA	R&P 2025	New					GMW 76-100	Good		
NFO Storage and QA	1003AH	Poor					GMW 76-100	Good		
NFO Storage and QA	1003AH	Poor					GMW 76-100	Good		
NFO Storage and QA	ML8850 SO2	Poor					GMW 76-100	Good		
NFO Storage and QA	ML8850 SO2	Poor					GMW 76-100	Good		
NFO Storage and QA	ML8850 SO2	Poor					GMW 2000	Good		
NFO Storage and QA	ML8850 SO2	Poor					Streamline Pro	Good		
NFO Storage and QA	ML8850 SO2	Poor					Streamline Pro	Good		
NFO Storage and QA	ML8850 SO2	Poor					Streamline Pro	Good		
NFO Storage and QA	ML8850 SO2	Poor					Streamline Pro	Good		
NFO Storage and QA	Thermo 43 SO2	Poor					Streamline Pro	Good		
NFO Storage and QA	Thermo 43A SO2	Poor					Streamline Pro	Good		
NFO Storage and QA	Thermo 43A SO2	Poor					Streamline Pro	Good		
NFO Storage and QA	ML8810	Poor					Tetracal	Good		
NFO Storage and QA	Teledyne 400E	Good					Tetracal	Good		

NFO Storage and QA	Teledyne 400E	Good					GMW 76-100	Good		
NFO Storage and QA	TEI 49	Poor					Streamline FTS	Poor		
NFO Storage and QA	TEI 49	Poor					Streamline FTS	Poor		
NFO Storage and QA	ML 9812	Poor					Streamline FTS	Poor		
NFO Storage and QA	ML 9812	Poor					Streamline FTS	Poor		
NFO Storage and QA	ML 8810	Poor					Streamline FTS	Poor		
NFO Storage and QA	ML 8810	Poor					Streamline FTS	Poor		
NFO Storage and QA	ML 9841	Poor					Streamline FTS	Poor		
NFO Storage and QA	API 400A	Poor					Streamline FTS	Poor		
NFO Storage and QA	API 400A	Poor					Roots meter 5M125TC	Good		
NFO Storage and QA	API 400A	Good					BGI Orifice	Good		
NFO Storage and QA	API 400A	Good					BGI Orifice	Good		
NFO Storage and QA	API 400A	Good					BGI Orifice	Good		
NFO Storage and QA	API 400A	Good					ML 8500	Poor		
NFO Storage and QA	API 400A	Poor					ML 8500	Poor		
NFO Storage and QA	TEI 49C	Good					ML 8500	Poor		
NFO Storage and QA	TEI 49C	Poor					ML 8500	Poor		

NFO Storage and QA	TEI 49C	Good					ML 8500	Poor		
NFO Storage and QA	TEI 49C	Good					ML 8500	Poor		
NFO Storage and QA	TEI 49i	Good								
NFO Storage and QA	TEI 49i	Good								
NFO Storage and QA	TEI 49i	Poor					Buck M-5	Good		
NFO Storage and QA	Tisch Housing	Good					BIOS DryCal DC-1B Rev 2.06F	Poor		
NFO Storage and QA	Tisch Housing	Good					Environics Calibrator	Poor		
NFO Storage and QA	Tisch Housing	Good					Environics Calibrator	Poor		
NFO Storage and QA	Tisch Housing	Good					Environics Calibrator	Poor		
NFO Storage and QA	GMW Housing	Good					Dasibi Calibrator	Poor		
NFO Storage and QA	GMW Housing	Good					Bios Drycal flow meter	Poor		
NFO Storage and QA	GMW Housing	Good					Dasibi Calibrator	Poor		
NFO Storage and QA	GMW Housing	Good					Dasibi Calibrator	Poor		
NFO Storage and QA	Anderson 2000	Good					Dasibi Calibrator	Poor		
NFO Storage and QA	Graseby	Good					Roots Meter	Good		
NFO Storage and QA	Graseby	Good					Cal Bench	Good		

NFO Storage and QA	Graseby	Poor								
NFO Storage and QA	Aircheck 224-PCXR7	Poor								
NFO Storage and QA	Aircheck 224-PCXR7	Poor								
NFO Storage and QA	Aircheck 224-PCXR7	Poor							shelter (from EV) 820	Good
NFO Storage and QA	API Analyzer	Good							shelter from CT	Good

## **The Purpose of Tennessee's Ambient Air Monitoring Network**

There are several criteria used to determine the need for ambient air quality monitoring. Some of the criteria are as follows:

EPA National Ambient Air Quality Standards (NAAQS) Criteria pollutant monitoring network requirements for the NCore (National Core) formally NAMS (National Air Monitoring Site), SLAMS (State and Local Air Monitoring Site) and SPM (Special Purpose Monitoring) monitoring networks.

The Code of Federal Regulations (CFR) sets forth as regulations the requirements for air quality monitoring to be implemented by the states and EPA. These requirements are primarily organized around population and emission density in a given area with the number of required monitors and the distribution of the monitors within the networks specified by these regulations. Additionally 40CFR, Part 58, Appendix D specifies criteria that must be followed in designing the NCore and SLAMS networks. The EPA must approve design and/or modifications to these networks.

Additional federal regulations also specify requirements for Prevention of Significant Deterioration (PSD) monitoring networks. This monitoring is addressed at new facilities to be constructed in a given area or around certain types of existing industry such as large coal fired power plants or facilities that release toxic heavy metals such as lead to the environment.

Air quality monitoring is required to be conducted to alert citizens in given areas to elevated levels of air pollutants in cities or communities of designated population levels that are required to provide Air Quality Index (AQI) reports to the general public.

Air quality monitoring is conducted to address the need for background air quality data and to provide needed air quality data that is used in industrial recruitment efforts with the monitoring areas periodically rotated to new locations throughout the state on a routine basis.

Special air quality monitoring studies are conducted based on identified needs for monitoring data in a given area.

Citizen complaints and enforcement investigations related to air quality are other reasons for air quality monitoring usually in or around a specific area related to the complaint or investigation.

Requests from citizens for special air monitoring studies are also a reason for air monitoring activities.

The federal regulations also specify the frequency, method, location requirements, equipment, quality assurance procedures and reporting of data collected from the ambient air monitoring networks.

## Ozone monitoring network requirements

40 CFR 58 Subpart G, Appendix D to Part 58 Revised as of July 1, 2012

TABLE D-2 OF APPENDIX D TO PART 58.— SLAMS MINIMUM O3 MONITORING REQUIREMENTS

MSA population <sup>1,2</sup>	Most recent 3-year design value concentrations $\geq 85\%$ of any O3 NAAQS <sup>3</sup>	Most recent 3-year design value concentrations $< 85\%$ of any O3 NAAQS <sup>3,4</sup>
>10 million	4	2
4–10 million	3	1
350,000–<4 million	2	1
50,000–<350,000 <sup>5</sup>	1	0

1 Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

2 Population based on latest available census figures.

3 The ozone (O3) National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.

4 These minimum monitoring requirements apply in the absence of a design value.

5 Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

**Note: The NAAQS for ozone was revised by EPA March 12, 2008 to 0.075 PPM. There were no regulatory changes made to the network monitoring requirements at that time.**

## PM 2.5 monitoring network requirements

40 CFR 58 Subpart G, Appendix D to Part 58 Revised as of July 1, 2012

TABLE D-5 OF APPENDIX D TO PART 58. PM2.5 MINIMUM MONITORING REQUIREMENTS

MSA population <sup>1,2</sup>	Most recent 3-year design value concentrations $\geq 85\%$ of any PM <sub>2.5</sub> NAAQS <sup>3</sup>	Most recent 3-year design value concentrations $< 85\%$ of any PM <sub>2.5</sub> NAAQS <sup>3,4</sup>	Continuous PM2.5 Monitoring	PM2.5 Background and Transport Sites	PM2.5 Chemical Speciation Sites
>1,000,000	3	2	1 - 2	One site each per state for background and transport.	Existing
500,000–1,000,000	2	1	1		STN
50,000–<500,000 <sup>5</sup>	1	0	0 - 1		Required Site(s)

1 Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

2 Population based on latest available census figures.

3 The PM2.5 National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.

4 These minimum monitoring requirements apply in the absence of a design value.

5 Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

4.7.2 Requirement for Continuous PM2.5 Monitoring. The State, or where appropriate, local agencies must operate continuous PM2.5 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 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. State and local air monitoring agencies must use methodologies and quality assurance/quality control (QA/QC) procedures approved by the EPA Regional Administrator for these required continuous analyzers.

4.7.3 Requirement for PM2.5 Background and Transport Sites. Each State shall install and operate at least one PM2.5 site to monitor for regional background and at least one PM2.5 site to monitor regional transport.

4.7.4 PM<sub>2.5</sub> Chemical Speciation Site Requirements. Each State shall continue to conduct chemical speciation monitoring and analyses at sites designated to be part of the PM<sub>2.5</sub> Speciation Trends Network (STN). The selection and modification of these STN sites must be approved by the Administrator.

## PM 10 monitoring network requirements

40 CFR 58 Subpart G, Appendix D to Part 58 Revised as of July 1, 2012

TABLE D-4 OF APPENDIX D TO PART 58. PM10 MINIMUM MONITORING REQUIREMENTS (NUMBER OF STATIONS PER MSA) 1

Population category	High concentration <sup>2</sup>	Medium concentration <sup>3</sup>	Low concentration <sup>4,5</sup>
>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 Selection of urban areas and actual numbers of stations per area within the ranges shown in this table will be jointly determined by EPA and the State Agency.

2 High concentration areas are those for which ambient PM<sub>10</sub> data show ambient concentrations exceeding the PM<sub>10</sub> NAAQS by 20 percent or more.

3 Medium concentration areas are those for which ambient PM<sub>10</sub> data show ambient concentrations exceeding 80 percent of the PM<sub>10</sub> NAAQS.

4 Low concentration areas are those for which ambient PM<sub>10</sub> data show ambient concentrations less than 80 percent of the PM<sub>10</sub> NAAQS.

5 These minimum monitoring requirements apply in the absence of a design value.

## SO<sub>2</sub> monitoring network requirements

40 CFR 58 Subpart G, Appendix D to Part 58 Revised as of July 1, 2012

### 4.4 Sulfur Dioxide (SO<sub>2</sub>) Design Criteria.

4.4.1 General Requirements. (a) State and, where appropriate, local agencies must operate a minimum number of required SO<sub>2</sub> monitoring sites as described below.

#### 4.4.2 Requirement for Monitoring by the Population Weighted Emissions Index.

(a) The population weighted emissions index (PWEI) shall be calculated by States for each core based statistical area (CBSA) they contain or share with another State or States for use in the implementation of or adjustment to the SO<sub>2</sub> monitoring network. The PWEI shall be calculated by multiplying the population of each CBSA, using the most current census data or estimates, and the total amount of SO<sub>2</sub> in tons per year emitted within the CBSA area, using an aggregate of the most recent county level emissions data available in the National Emissions Inventory for each county in each CBSA. The resulting product shall be divided by one million, providing a PWEI value, the units of which are million persons-tons per year. For any CBSA with a calculated PWEI value equal to or greater than 1,000,000, a minimum of three SO<sub>2</sub> monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 100,000, but less than 1,000,000, a minimum of two SO<sub>2</sub> monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 5,000, but less than 100,000, a minimum of one SO<sub>2</sub> monitor is required within that CBSA.

(1) The SO<sub>2</sub> monitoring site(s) required as a result of the calculated PWEI in each CBSA shall satisfy minimum monitoring requirements if the monitor is sited within the boundaries of the parent CBSA and is one of the following site types (as defined in section 1.1.1 of this appendix): population

exposure, highest concentration, source impacts, general background, or regional transport. SO2 monitors at NCore stations may satisfy minimum monitoring requirements if that monitor is located within a CBSA with minimally required monitors under this part. Any monitor that is sited outside of a CBSA with minimum monitoring requirements to assess the highest concentration resulting from the impact of significant sources or source categories existing within that CBSA shall be allowed to count towards minimum monitoring requirements for that CBSA.

PWEI calculations were performed for CBSA's in Tennessee based on emissions and populations listed in the following table. Based on these calculations ambient sulfur dioxide monitors are required as listed in the table.

CBSA ID	CBSA Name		2008 NEI v1.5 so2 (tpy)	Population (2010)	PWEI in Million persons-tpy	Required Monitors	Population (2009) Est.	PWEI in Million persons-tpy	Required Monitors
34980	Nashville-Davidson--Murfreesboro--Franklin	TN	41,476	1,589,934	65,944	1	1,582,264	65,626	1
28940	Knoxville	TN	39,833	698,030	27,805	1	699,247	27,853	1
32820	Memphis	TN-MS-AR	17,651	1,316,100	23,231	1	1,304,926	23,034	1
28700	Kingsport-Bristol-Bristol	TN-VA	56,754	309,544	17,568	1	305,629	17,346	1
17300	Clarksville	TN-KY	16,820	273,949	4,608	0	268,546	4,517	0
25340	Harriman	TN	50,674	54,181	2,746	0	53,508	2,711	0
16860	Chattanooga	TN-GA	2,178	528,143	1,150	0	524,303	1,142	0
27740	Johnson City	TN	2,976	198,716	591	0	197,381	587	0
34100	Morristown	TN	4,004	136,608	547	0	137,612	551	0
27180	Jackson	TN	2,894	115,425	334	0	113,629	329	0
17420	Cleveland	TN	2,692	115,788	312	0	113,358	305	0

Population Weighted Emissions Index (PWEI) Calculations - April 2012 - Using 2010 Census Data & 2008 NEI v1.5 (no fires included)

#### 4.4.3 Regional Administrator Required Monitoring.

(a) The Regional Administrator may require additional SO2 monitoring stations above the minimum number of monitors required in 4.4.2 of this part, where the minimum monitoring requirements are not sufficient to meet monitoring objectives. The Regional Administrator may require, at his/her discretion, additional monitors in situations where an area has the potential to have concentrations that may violate or contribute to the violation of the NAAQS, in areas impacted by sources which are not conducive to modeling, or in locations with susceptible and vulnerable populations, which are not monitored under the minimum monitoring provisions described above. The Regional Administrator and the responsible State or local air monitoring agency shall work together to design and/or maintain the most appropriate SO2 network to provide sufficient data to meet monitoring objectives

#### 4.4.5 NCore Monitoring.

(a) SO2 measurement are included within the NCore multi-pollutant site requirements as described in paragraph (3)(b) of this appendix. NCore based SO2 measurements are primarily used to characterize SO2 trends and assist in understanding SO2 transport across representative areas in urban or rural locations and are also used for comparison with the SO2 NAAQS. SO2 monitors at NCore sites that exist in CBSAs with minimum monitoring requirements per section 4.4.2 above shall be allowed to count towards those minimum monitoring requirements.

## NO2 monitoring network requirements

40 CFR 58 Subpart G, Appendix D to Part 58 Revised as of July 1, 2012

#### 4.3.2 Requirement for Near-road NO2 Monitors

(a) Within the NO2 network, there must be one microscale near-road NO2 monitoring station in each CBSA with a population of 500,000 or more persons to monitor a location of expected maximum hourly concentrations sited near a major road with high AADT counts as specified in paragraph 4.3.2(a)(1) of this appendix. An additional near-road NO2 monitoring station is required for any CBSA with a population of

2,500,000 persons or more, or in any CBSA with a population of 500,000 or more persons that has one or more roadway segments with 250,000 or greater AADT counts to monitor a second location of expected maximum hourly concentrations. CBSA populations shall be based on the latest available census figures.

(1) The near-road NO<sub>2</sub> monitoring stations shall be selected by ranking all road segments within a CBSA by AADT and then identifying a location or locations adjacent to those highest ranked road segments, considering fleet mix, roadway design, congestion patterns, terrain, and meteorology, where maximum hourly NO<sub>2</sub> concentrations are expected to occur and siting criteria can be met in accordance with appendix E of this part. Where a State or local air monitoring agency identifies multiple acceptable candidate sites where maximum hourly NO<sub>2</sub> concentrations are expected to occur, the monitoring agency shall consider the potential for population exposure in the criteria utilized to select the final site location. Where one CBSA is required to have two near-road NO<sub>2</sub> monitoring stations, the sites shall be differentiated from each other by one or more of the following factors: fleet mix; congestion patterns; terrain; geographic area within the CBSA; or different route, interstate, or freeway designation.

(b) Measurements at required near-road NO<sub>2</sub> monitor sites utilizing chemiluminescence FRMs must include at a minimum: NO, NO<sub>2</sub>, and NO<sub>x</sub>.

**Originally, near –road monitoring sites were to be established and in operation by January 1, 2013. However, the lack of funding has delayed the implementation of near-road monitoring requirements. As a result EPA is following a build and hold plan in establishing the near-road monitoring network. The Memphis and Nashville CBSA’s are listed in the second phase of the build and hold plan and are scheduled to receive funding during fiscal year 2013 to establish a single near-road site in each CBSA. In the meantime Tennessee APC and the local air pollution control agencies in Memphis and Nashville are working with the Tennessee Department of Transportation (TDOT), to identify acceptable sites and work out details to meet siting requirements set forth by EPA and TDOT.**

#### 4.3.3 Requirement for Area-wide NO<sub>2</sub> Monitoring

(a) Within the NO<sub>2</sub> network, there must be one monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected highest NO<sub>2</sub> concentrations representing the neighborhood or larger spatial scales. PAMS sites collecting NO<sub>2</sub> data that are situated in an area of expected high NO<sub>2</sub> concentrations at the neighborhood or larger spatial scale may be used to satisfy this minimum monitoring requirement when the NO<sub>2</sub> monitor is operated year round. Emission inventories and meteorological analysis should be used to identify the appropriate locations within a CBSA for locating required area-wide NO<sub>2</sub> monitoring stations. CBSA populations shall be based on the latest available census figures.

**An area-wide NO<sub>2</sub> monitoring site is required in each of the Memphis and Nashville CBSA’s. An area-wide NO<sub>2</sub> monitoring site is currently in operation in the Nashville CBSA (Site 47-037-0011). Currently the State of Arkansas operates an NO<sub>2</sub> monitor at its Marion site (AQS 05-035-0005) which is in the Memphis CBSA. Consideration should be given to approving this site to meet the Community-Wide NO<sub>2</sub> monitoring requirement in the Memphis CBSA.**

## Lead monitoring network requirements

40 CFR 58 Subpart G, Appendix D to Part 58 Revised as of July 1, 2012

#### 4.5 Lead (Pb) Design Criteria. *Lead (Pb) Design Criteria.*

(a) State and, where appropriate, local agencies are required to conduct ambient air Pb monitoring near Pb sources which are expected to or have been shown to contribute to a maximum Pb concentration in ambient air in excess of the NAAQS, taking into account the logistics and potential for population exposure. At a minimum, there must be one source-oriented SLAMS 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 based on either the most recent National Emission Inventory (<http://www.epa.gov/ttn/chief/eiinformation.html>) or other scientifically justifiable methods and data (such as

improved emissions factors or site-specific data) taking into account logistics and the potential for population exposure.

(i) One monitor may be used to meet the requirement in paragraph 4.5(a) for all sources involved when the location of the maximum Pb concentration due to one Pb source is expected to also be impacted by Pb emissions from a nearby source (or multiple sources). This monitor must be sited, taking into account logistics and the potential for population exposure, where the Pb concentration from all sources combined is expected to be at its maximum.

(ii) The Regional Administrator may waive the requirement in paragraph 4.5(a) for monitoring near Pb sources if the State or, where appropriate, local agency can demonstrate the Pb source will not contribute to a maximum Pb concentration in ambient air in excess of 50% of the NAAQS (based on historical monitoring data, modeling, or other means). The waiver must be renewed once every 5 years as part of the network assessment required under 58.10(d).

(b) State and, where appropriate, local agencies are required to conduct non-source oriented Pb monitoring at each NCore site required under paragraph 3 of this appendix in a CBSA with a population of 500,000 or more.

## CO monitoring network requirements

40 CFR 58 Subpart G, Appendix D to Part 58 Revised as of July 1, 2012

### 4.2 Carbon Monoxide (CO) Design Criteria.

#### 4.2.1 General Requirements.

(a) Except as provided in subsection (b), one CO monitor is required to operate collocated with one required near-road NO<sub>2</sub> monitor, as required in Section 4.3.2 of this part, in CBSAs having a population of 1,000,000 or more persons. If a CBSA has more than one required near-road NO<sub>2</sub> monitor, only one CO monitor is required to be collocated with a near-road NO<sub>2</sub> monitor within that CBSA.

(b) If a state provides quantitative evidence demonstrating that peak ambient CO concentrations would occur in a near-road location which meets microscale siting criteria in Appendix E of this part but is not a near-road NO<sub>2</sub> monitoring site, then the EPA Regional Administrator may approve a request by a state to use such an alternate near-road location for a CO monitor in place of collocating a monitor at near-road NO<sub>2</sub> monitoring site.

#### 4.2.2 Regional Administrator Required Monitoring.

(a) The Regional Administrators, in collaboration with states, may require additional CO monitors above the minimum number of monitors required in 4.2.1 of this part, where the minimum monitoring requirements are not sufficient to meet monitoring objectives. The Regional Administrator may require, at his/her discretion, additional monitors in situations where data or other information suggest that CO concentrations may be approaching or exceeding the NAAQS.

## Index reporting requirements

40 CFR 58 Subpart F, 58.50 Revised as of July 1, 2012

### 58.50 Index reporting.

(a) The State or where applicable, local agency shall report to the general public on a daily basis through prominent notice an air quality index that complies with the requirements of appendix G to this part.

(b) Reporting is required for all individual MSA with a population exceeding 350,000.

(c) The population of a MSA for purposes of index reporting is the most recent decennial U.S. census population.

Geographic area	2000 Census	2010 Census	Required to Have AQI Reporting	Daily AQI/Air Quality Forecasts Provided
Chattanooga, TN-GA	476,531	528,143	Yes	Yes
Clarksville, TN-KY	232,000	273,949	No	Yes
Cleveland, TN	104,015	115,788	No	No

Jackson, TN	107,377	115,425	No	No
Johnson City, TN	181,607	198,716	No	Yes Based on the combined population of both areas.
Kingsport-Bristol-Bristol, TN-VA	298,484	309,544	No	
Knoxville, TN	616,079	698,030	Yes	Yes In addition, the GSMNP has a separate AQI/Forecast provided.
Memphis, TN-MS-AR	1,205,204	1,316,100	Yes	Yes
Morristown, TN	123,081	136,608	No	No
Nashville-Davidson--Murfreesboro, TN	1,311,789	1,589,934	Yes	Yes

## NCore monitoring network requirements and PM 10-2.5

40 CFR 58 Subpart G, Appendix D to Part 58 Revised as of July 1, 2012

### 3. Design Criteria for NCore Sites

(a) Each State (i.e. the fifty States, District of Columbia, Puerto Rico, and the Virgin Islands) is required to operate at least one NCore site. States may delegate this requirement to a local agency. States with many MSAs often also have multiple air sheds with unique characteristics and, often, elevated air pollution. These States include, at a minimum, California, Florida, Illinois, Michigan, New York, North Carolina, Ohio, Pennsylvania, and Texas. These States are required to identify one to two additional NCore sites in order to account for their unique situations. These additional sites shall be located to avoid proximity to large emission sources. Any State or local agency can propose additional candidate NCore sites or modifications to these requirements for approval by the Administrator. The Ncore locations should be leveraged with other multi-pollutant air monitoring sites including PAMS sites, National Air Toxics Trends Stations (NATTS) sites, CASTNET sites, and STN sites. Site leveraging includes using the same monitoring platform and equipment to meet the objectives of the variety of programs where possible and advantageous.

(b) The NCore sites must measure, at a minimum, PM<sub>2.5</sub> particle mass using continuous and integrated/filter-based samplers, speciated PM<sub>2.5</sub>, PM<sub>10-2.5</sub> particle mass, speciated PM<sub>10-2.5</sub>, O<sub>3</sub>, SO<sub>2</sub>, CO, NO/NO<sub>y</sub>, wind speed, wind direction, relative humidity, and ambient temperature. NCore sites in CBSA with a population of 500,000 people (as determined in the latest Census) or greater shall also measure Pb either as Pb-TSP or Pb-PM<sub>10</sub>. The EPA Regional Administrator may approve an alternative location for the Pb measurement where the alternative location would be more appropriate for logistical reasons and the measurement would provide data on typical Pb concentrations in the CBSA.

(1) Although the measurement of NO<sub>y</sub> is required in support of a number of monitoring objectives, available commercial instruments may indicate little difference in their measurement of NO<sub>y</sub> compared to the conventional measurement of NO<sub>x</sub>, particularly in areas with relatively fresh sources of nitrogen emissions. Therefore, in areas with negligible expected difference between NO<sub>y</sub> and NO<sub>x</sub> measured concentrations, the Administrator may allow for waivers that permit NO<sub>x</sub> monitoring to be substituted for the required NO<sub>y</sub> monitoring at applicable NCore sites.

(2) EPA recognizes that, in some cases, the physical location of the NCore site may not be suitable for representative meteorological measurements due to the site's physical surroundings. It is also possible that nearby meteorological measurements may be able to fulfill this data need. In these cases, the requirement for meteorological monitoring can be waived by the Administrator.

40 CFR 58 Subpart G, Appendix D to Part 58 Revised as of July 1, 2012

### 4.8 Coarse Particulate Matter (PM<sub>10-2.5</sub>) Design Criteria.

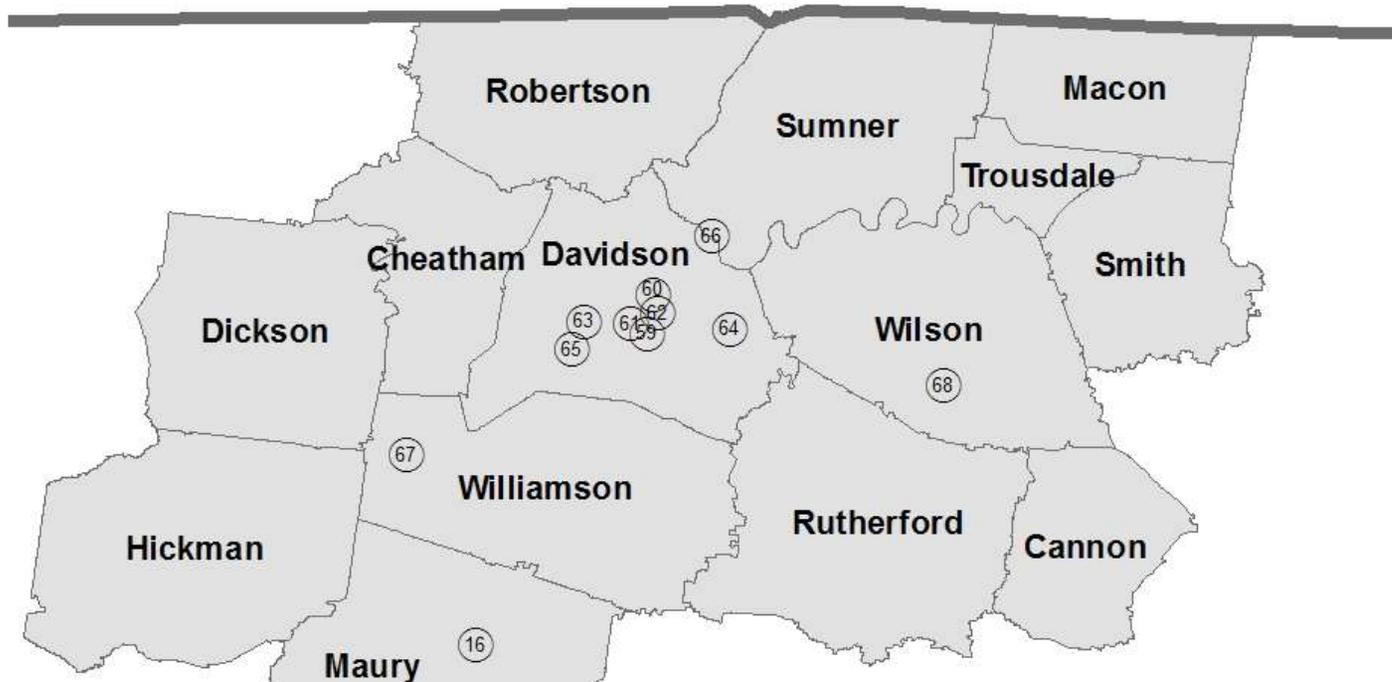
#### 4.8.1 General Monitoring Requirements.

(a) The only required monitors for PM<sub>10-2.5</sub> are those required at NCore Stations.

#### 4.8.2 PM<sub>10-2.5</sub> Chemical Speciation Site Requirements.

PM<sub>10-2.5</sub> chemical speciation monitoring and analyses is required at NCore sites. The selection and modification of these sites must be approved by the Administrator. Samples must be collected using the monitoring methods and the sampling schedules approved by the Administrator.

## Nashville-Davidson--Murfreesboro, TN MSA Area



Site	AQSID	ParaName	CBSAFP	Address
59	470370002	PM10	34980	LESTER & HART STS
60	470370011	SO2, NO2, O3	34980	1015 TRINITY LANE
61	470370021	CO	34980	700 BROADWAY
62	470370023	PM2.5, PM2.5, PM Cont, PM Spec	34980	105 SOUTH 17TH ST @ LOCKELAND SCHOOL
63	470370024	PM10, PM10	34980	56TH AVE AND LOUISIANA ST
64	470370026	O3	34980	3711 BELL ROAD
65	470370036	PM2.5	34980	400 DAVIDSON RD
66	471650007	O3, PM2.5, PM2.5, PM2.5 Cont	34980	ROCKLAND RECREATION AREA-OLD HICKORY DAM
67	471870106	O3	34980	FAIRVIEW MIDDLE SCHOOL CROW CUT ROAD
68	471890103	O3	34980	CEDARS OF LEBANON STATE PARK
16	471192007	PM2.5	34980	1600 NASHVILLE HWY

**Tennessee'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 SO2		42602 NO2		44201 Ozone			81102 PM 10		88101 PM 2.5				88502 PM 2.5 Speciation		88101 or 88501 PM 2.5 Cont	
CBSA Code	Census 2000 / 2010	CBSA Title (MS Areas)	Operating	Required	Operating	Required	Operating	Required	Operating	Required	Operating	2010 2012 8 Hr DV	Required	Operating	Required	Operating	2010 2012 Annual DV ug/m	2010 2012 24 Hr DV ug/m	Required	Operating	Required	Operating	Required
34980	1311789/1589934	Nashville-Davidson-Murfreesboro, TN	0	0	1	1	1	1	1	1	5	0.079	2	3 <sup>1</sup>	2	5 <sup>1</sup>	10.9	22	2	1	1	2	1

<sup>1</sup> Includes collocated monitor.

The TEOM POC 3 PM2.5 particulate monitors and the speciation POC 5 STN monitors are generally not suited to be used for comparisons to the annual PM2.5 standards.

There are no plans to relocate or shutdown any existing monitoring sites in the MSA area described. The PM<sub>10</sub> monitor at 470370002 has been temporarily shut down during construction at the site.

An application has been submitted to establish a NO<sub>2</sub> near road monitoring site. No lead monitors are anticipated to be established as there are no sources emitting 0.5 TPY of lead. No additional SO<sub>2</sub> monitors are anticipated to be required to be established. An additional CO monitor will be collocated with the near road NO<sub>2</sub> monitor. The need for additional monitoring sites may be met by re-location of existing network sites. Additional monitoring sites will require additional resources for both equipment and operational expenses.

**Revisions to the Davidson County portions of the Ambient Monitoring Plan (AMP) provided courtesy of the Metropolitan Health Department/Nashville & Davidson County Air Pollution Control Program.**

AQSID	County Name	Monitor Type	Para	Para Name	POC	Int	Year	Collection Frequency	Address	CBSA	Lat	Lon	Mtd	RepOrg	RepOrgName
470370002	Davidson	SLAMS	81102	PM10	1	7	2012	6	LESTER & HART STS	34980	+36.143244	-86.754611	063	0682	Metropolitan Health Department/Nashville & Davidson County
470370011	Davidson	SLAMS	42401	SO2	1	1	2012	Hourly	1015 TRINITY LANE	34980	+36.205000	-86.744722	061	0682	Metropolitan Health Department/Nashville & Davidson County
470370011	Davidson	UNKNOW N	42602	NO2	1	1	2012	Hourly	1015 TRINITY LANE	34980	+36.205000	-86.744722	074	0682	Metropolitan Health Department/Nashville & Davidson County
470370011	Davidson	UNKNOW N	44201	O3	1	1	2012	Hourly	1015 TRINITY LANE	34980	+36.205000	-86.744722	047	0682	Metropolitan Health Department/Nashville & Davidson County
470370021	Davidson	UNKNOW N	42101	CO	1	1	2012	Hourly	700 BROADWAY	34980	+36.159671	-86.781149	054	0682	Metropolitan Health Department/Nashville & Davidson County
470370023	Davidson	SLAMS	88101	PM2.5	1	7	2012	6	105 SOUTH 17TH ST @ LOCKELAND SCHOOL	34980	+36.176326	-86.738902	120	0682	Metropolitan Health Department/Nashville & Davidson County
470370023	Davidson	SLAMS	88101	PM2.5	2	7	2012	6	105 SOUTH 17TH ST @ LOCKELAND SCHOOL	34980	+36.176326	-86.738902	120	0682	Metropolitan Health Department/Nashville & Davidson County
470370023	Davidson	INDEX SITE	88502	PM2.5 Cont	3	1	2012	Hourly	105 SOUTH 17TH ST @ LOCKELAND SCHOOL	34980	+36.176326	-86.738902	717	0682	Metropolitan Health Department/Nashville & Davidson County
470370023	Davidson	SUPLMN TL SPECIATION	88502	PM Spec Carbon	5	7	2012	6	105 SOUTH 17TH ST @ LOCKELAND SCHOOL	34980	+36.176326	-86.738902	810	0682	Metropolitan Health Department/Nashville & Davidson County
470370024	Davidson	SLAMS	81102	PM10	1	7	2012	6	56TH AVE AND LOUISIANA ST	34980	+36.162763	-86.854927	063	0682	Metropolitan Health Department/Nashville & Davidson County
470370024	Davidson	QA COLLOC	81102	PM10	2	7	2012	6	56TH AVE AND LOUISIANA ST	34980	+36.162763	-86.854927	063	0682	Metropolitan Health

AQSID	County Name	Monitor Type	Para	Para Name	POC	Int	Year	Collection Frequency	Address	CBSA	Lat	Lon	Mtd	RepOrg	RepOrgName
		ATED													Department/Nashville & Davidson County
470370026	Davidson	SLAMS	44201	O3	1	1	2012	Hourly	3711 BELL ROAD	34980	+36.150742	-86.623301	047	0682	Metropolitan Health Department/Nashville & Davidson County
470370036	Davidson	SLAMS	88101	PM2.5	1	7	2012	1	400 DAVIDSON RD	34980	+36.118251	-86.873547	120	0682	Metropolitan Health Department/Nashville & Davidson County
471650007	Sumner	SLAMS	44201	O3	1	1	2012	Hourly	ROCKLAND RECREATION AREA-OLD HICKORY DAM	34980	+36.297778	-86.652778	047	1025	Tennessee Division Of Air Pollution Control
471650007	Sumner	SLAMS	88101	PM2.5	1	7	2012	3	ROCKLAND RECREATION AREA-OLD HICKORY DAM	34980	+36.297778	-86.652778	118	1025	Tennessee Division Of Air Pollution Control
471650007	Sumner	SLAMS	88101	PM2.5	2	7	2012	6	ROCKLAND RECREATION AREA-OLD HICKORY DAM	34980	+36.297778	-86.652778	118	1025	Tennessee Division Of Air Pollution Control
471650007	Sumner	SPECIAL PURPOSE	88501	PM2.5 Cont	3	1	2012	Hourly	ROCKLAND RECREATION AREA-OLD HICKORY DAM	34980	+36.297778	-86.652778	716	1025	Tennessee Division Of Air Pollution Control
471870106	Williamson	SLAMS	44201	O3	1	1	2012	Hourly	FAIRVIEW MIDDLE SCHOOL CROW CUT ROAD	34980	+35.951944	-87.137222	047	1025	Tennessee Division Of Air Pollution Control
471890103	Wilson	SLAMS	44201	O3	1	1	2012	Hourly	CEDARS OF LEBANON STATE PARK	34980	+36.060372	-86.286085	047	1025	Tennessee Division Of Air Pollution Control
471192007	Maury	SPECIAL PURPOSE	88101	PM2.5	1	7	2012	3	1600 NASHVILLE HWY	17940	+35.651920	-87.026300	118	1025	Tennessee Division Of Air Pollution Control

AQSID	County Name	Monitor Type	Para	Para Name	Monitoring Instrument	Analysis	Ref Mtd ID	Monitor Objective Type	Dominant Source	Measurement Scale	Land Use Type	Location Setting	Date Site Established
470370002	Davidson	SLAMS	81102	PM10	GMW Model 1200	GRAVIMETRIC	RFPS - 1287-063	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	COMMERCIAL	URBAN AND CENTER CITY	8/22/1969
470370011	Davidson	SLAMS	42401	SO2	DASIBI 4108	ULTRA VIOLET FLUORESCENCE	EQS A-1086-061	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	URBAN AND CENTER CITY	5/1/1970
470370011	Davidson	UNKNOWN	42602	NO2	THERMO ENVIRON. INST. MODEL 42	CHEMILUMINESCENCE	RFN A-1289-074	HIGHEST CONCENTRATION	AREA	NEIGHBORHOOD	RESIDENTIAL	URBAN AND CENTER CITY	5/1/1970
470370011	Davidson	UNKNOWN	44201	O3	THERMO ELECTRON 49	ULTRA VIOLET	EQA A-0880-047	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	URBAN AND CENTER CITY	5/1/1970
470370021	Davidson	UNKNOWN	42101	CO	THERMO ELECTRON 48, 48C, 48i	NONDISPERSIVE INFRARED	RFA A-0981-054	HIGHEST CONCENTRATION	MOBILE	MICROSCALE	COMMERCIAL	URBAN AND CENTER CITY	4/14/1972
470370023	Davidson	SLAMS	88101	PM2.5	Andersen RAAS2.5-300 PM2.5 SEQ	GRAVIMETRIC	RFPS - 0598-120	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	INDUSTRIAL	URBAN AND CENTER CITY	1/1/1976
470370023	Davidson	SLAMS	88101	PM2.5	Andersen RAAS2.5-300 PM2.5 SEQ	GRAVIMETRIC	RFPS - 0598-120	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	INDUSTRIAL	URBAN AND CENTER CITY	1/1/1976
470370023	Davidson	INDEX SITE	88502	PM2.5 Cont		TEOM Gravimetric 50 deg C		POPULATION EXPOSURE	AREA	NEIGHBORHOOD	INDUSTRIAL	URBAN AND CENTER CITY	1/1/1976
470370023	Davidson	SUPLM NTL SPECIATION	88502	PM Spec Carbon	MetOne Super SASS URG 3000	GRAVIMETRIC		POPULATION EXPOSURE	NULL	NULL	INDUSTRIAL	URBAN AND CENTER CITY	1/1/1976
470370024	Davidson	SLAMS	81102	PM10	GMW Model 1200	GRAVIMETRIC	RFPS - 1287-063	HIGHEST CONCENTRATION	AREA	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	1/1/1976
470370024	Davidson	QA COLLOCATED	81102	PM10	GMW Model 1200	GRAVIMETRIC	RFPS - 1287-063	QUALITY ASSURANCE	NULL	NULL	RESIDENTIAL	SUBURBAN	1/1/1976
470370026	Davidson	SLAMS	44201	O3	THERMO ELECTRON 49	ULTRA VIOLET	EQA A-0880-047	HIGHEST CONCENTRATION	AREA	URBAN SCALE	FOREST	RURAL	1/1/1978
470370036	Davidson	SLAMS	88101	PM2.5	Andersen RAAS2.5-300 PM2.5 SEQ	GRAVIMETRIC	RFPS - 0598-120	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	12/1/1998

AQSID	County Name	Monitor Type	Para	Para Name	Monitoring Instrument	Analysis	Ref Mtd ID	Monitor Objective Type	Dominant Source	Measurement Scale	Land Use Type	Location Setting	Date Site Established
471650007	Sumner	SLAMS	44201	O3	THERMO ELECTRO N 49	ULTRA VIOLET	EQA-0880-047	HIGHEST CONCENTRATION	AREA	URBAN SCALE	INDUSTRIAL	RURAL	1/1/1973
471650007	Sumner	SLAMS	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	AREA	URBAN SCALE	INDUSTRIAL	RURAL	1/1/1973
471650007	Sumner	SLAMS	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	UNKNOWN	NULL	NULL	INDUSTRIAL	RURAL	1/1/1973
471650007	Sumner	SPECIAL PURPOSE	88501	PM2.5 Cont		TEOM Gravimetric 50 deg C		POPULATION EXPOSURE	AREA	URBAN SCALE	INDUSTRIAL	RURAL	1/1/1973
471870106	Williamson	SLAMS	44201	O3	THERMO ELECTRO N 49	ULTRA VIOLET	EQA-0880-047	POPULATION EXPOSURE	NULL	NULL	AGRICULTURAL	RURAL	4/11/1997
471890103	Wilson	SLAMS	44201	O3	THERMO ELECTRO N 49	ULTRA VIOLET	EQA-0880-047	HIGHEST CONCENTRATION	AREA	URBAN SCALE	FOREST	RURAL	5/1/1988
471192007	Maury	SPECIAL PURPOSE	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	AREA	MIDDLE SCALE	COMMERCIAL	URBAN AND CENTER CITY	12/25/1998






**Near-Road Monitoring Site Application Nashville/Davidson County December 2012**

## **Introduction**

On February 9, 2010, EPA promulgated new minimum monitoring requirements for the nitrogen dioxide (NO<sub>2</sub>) monitoring network in support of a newly revised 1-hour NO<sub>2</sub> National Ambient Air Quality Standard (NAAQS) and the retained annual NAAQS. In the new monitoring requirements, state and local air monitoring agencies are required to install near-road NO<sub>2</sub> monitoring stations at locations where peak hourly NO<sub>2</sub> concentrations are expected to occur within the near-road environment in larger urban areas. State and local air agencies are required to consider traffic volumes, fleet mix, roadway design, traffic congestion patterns, local terrain or topography, and meteorology in determining where a required near-road NO<sub>2</sub> monitor should be placed. In addition to those required considerations listed above, there are other factors that impact the selection and implementation of a near-road monitoring station including satisfying siting criteria, site logistics (e.g., gaining access to property and safety), and population exposure. On August 31, 2011, EPA revised the carbon monoxide NAAQS to also require a near-road monitor. The purpose of this document is to present the proposed near-road monitoring site for EPA's approval.

## **Minimum Monitoring Requirements**

40 CFR Part 58, Appendix D, requires state and local air agencies to operate one near-road NO<sub>2</sub> monitor in each Core Based Statistical Area (CBSA) with a population of 500,000 or more persons. CBSAs with 2,500,000 or more persons, or with one or more roadway segments carrying traffic volumes of 250,000 or more vehicles (as measured by annual average daily traffic [AADT] counts), shall have two near-road NO<sub>2</sub> monitors. According to the U.S. Census Bureau, the Nashville-Davidson-Murfreesboro-Franklin (Nashville), Tennessee statistical area population for 2011 is 1,617,142. The highest AADT for a Nashville road segment is 163,417, based on 2011 data obtained from the Metropolitan Planning Organization (MPO). Since the population is between 500,000 and 2,500,000, and the maximum AADT is less than 250,000, only one near-road monitor will be required in the CBSA.

## **AADT Matrix and Site Selection**

Annual Average Daily Traffic counts were obtained for 542 road segments in Nashville. Heavy Duty Vehicle counts were available for the 17 highest AADT road segments. The Fleet-Equivalent (FE) AADT was calculated by weighting each Heavy Duty vehicle as 10 regular vehicles. Road segments were then sorted based on FE-AADT and ranked from highest to lowest. The resulting matrix is found in **Table 1**. Metro Planning Property Maps were used to determine the owner of each piece of property on the meteorologically desirable side of each of these road segments. Google Earth was used to find Tennessee Department of Transportation (TDOT) right-of-way (R.O.W.) that may be accessible by surface roads. Potential sites were identified and visited by staff to determine whether they were candidates for the near-road monitoring station. The road segment with the optimum monitoring site is highlighted in the

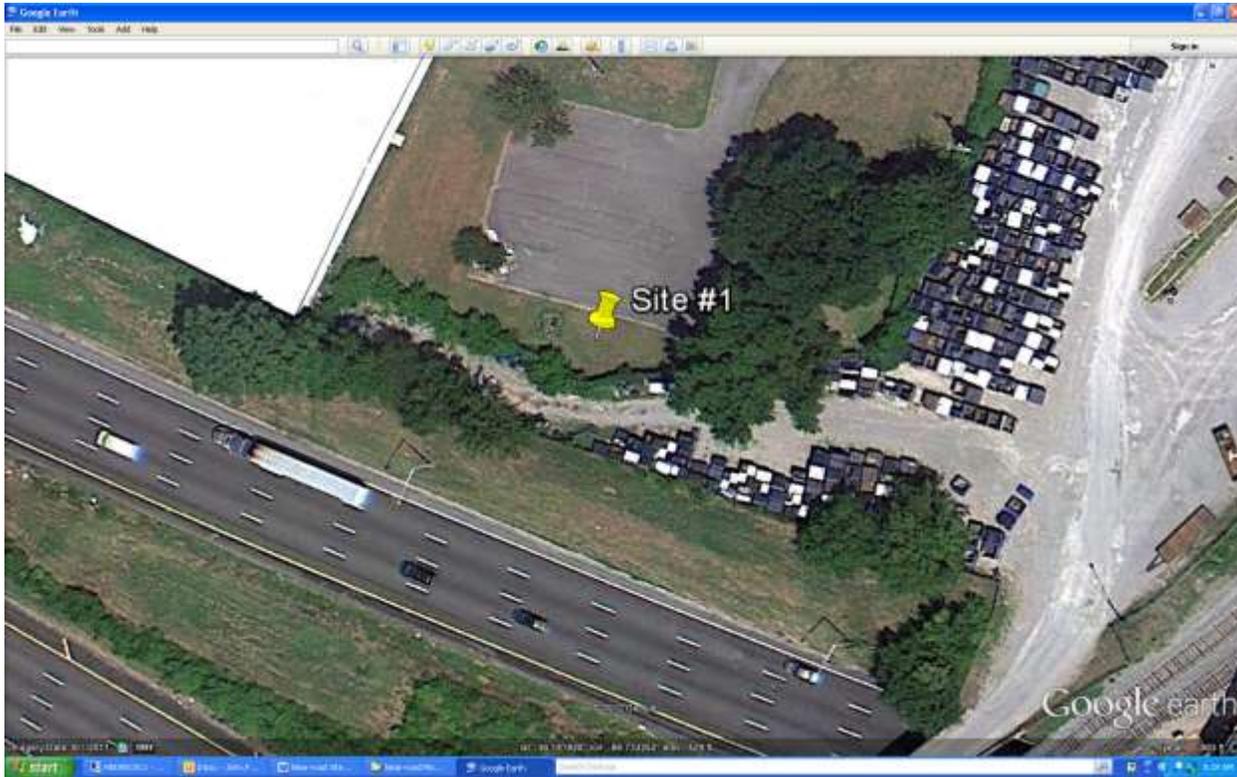
AADT Matrix, along with the percentage of the associated FE-AADT as it compares to the maximum FE-AADT in the CBSA.

<u>Road</u>	<u>Endpoint</u>	<u>Endpoint</u>	<u>Avg. AADT</u>	<u>AADT Rank</u>	<u>HD Vehicle AADT %</u>	<u>HD Vehicle AADT</u>	<u>HD Vehicle AADT Rank</u>	<u>FE-AADT</u>	<u>FE-AADT Rank</u>	
24	N of Thompson	N of Antioch Pike	162,696	2	0.14	22777	5	367,693	1	
24	N or Antioch Pike	S of Harding	162,009	3	0.14	22681	6	366,140	2	
24	24/440	N of Thompson	161,300	4	0.14	22582	8	364,538	3	
24/40	40/24	Fairfield	159,804	5	0.14	22373	9	361,157	4	
24	S of Harding	N of Blue Hole	155,852	6	0.145	22599	7	359,239	5	
24	N of Blue Hole	S of Bell	146,226	11	0.16	23396	3	356,791	6	
24	S of Bell	S of HHP	140,492	15	0.17	23884	1	355,445	7	
24/40	Fairfield	W of Fesslers	163,417	1	0.13	21244	11	354,615	8	
24/440	24/40/440	24/440	139,056	16	0.17	23640	2	351,812	9	
24/40	40/24	Sillman Evans	136,969	17	0.17	23285	4	346,532	10	
24/40	W of Fesslers	E of Elm Hill Pike	155,617	7	0.135	21008	12	344,692	11	
24/40	E of Elm Hill Pike	24/40/440	144,204	14	0.15	21631	10	338,879	12	92.20%
65	North of Powell	65/440	153,570	9	0.07	10750	13	250,319	13	
65	N of Powell	S of Powell	151,665	10	0.07	10617	14	247,214	14	
24/65	24/65	S of Trinity	155,561	8	0.06	9334	16	239,564	15	
65	S of Powell	N of OHB	145,598	12	0.07	10192	15	237,325	16	
24/65	S of Trinity	N or Trinity	145,365	13	0.06	8722	17	223,862	17	

**TABLE 1**

## Proposed Site

The candidate site is located along the north side of I-24/40, between Elm Hill Pike and the I 24/40/440 Interchange. This road segment is the 12<sup>th</sup> ranked FE-AADT, accounting for 92.2% of the maximum FE-AADT. The property already belongs to the Metropolitan Government of Nashville/Davidson County, Public Library/Metro Archive.



**Roadway design or configuration** – A below-grade road with sloped walls. The monitoring site is no more than 10 feet above the road.

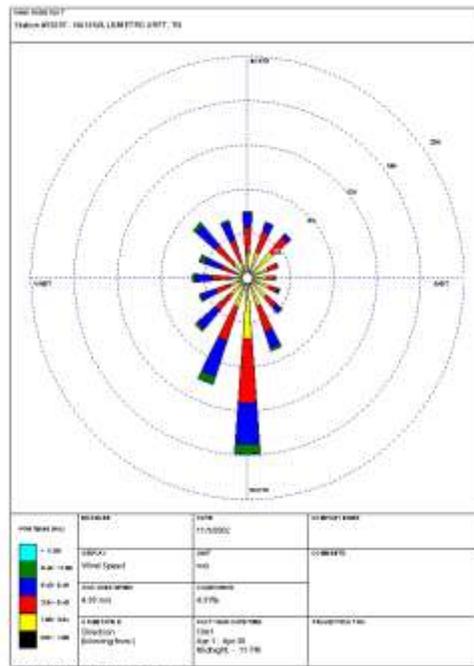
**Roadside structures** – There are no sound walls or obstructive buildings. There is some vegetation on an old 6 ft fence (below) that will be cleared when the fence is replaced for security purposes.



**Terrain** – Gentle terrain. Not along any extreme elevation changes or windswept areas. The picture below is from the street side. The proposed site is on the other side of the trees in this photo. The trees pictured below are on TDOT ROW. The Pollution Control Division has obtained written permission from TDOT to remove these trees during site preparation.



**Meteorology** – Relative downwind location – winds tend to move from the road to the monitor.



**Horizontal Spacing** – The monitor probe would be located approximately 30 meters (100 feet) from the nearest edge of the traffic lanes of the target road segment.

**Vertical Spacing** – The monitor probe will be located on top of a monitoring shelter at approximately 4 - 5 meters above ground level.

**Existing Safety Features** – At this location, the monitoring shelter would not be readily seen by the road. This should reduce the potential for vandalism and theft. The Metro property that this site is on has restricted access with a locked gate, which should lend to the security of the site.

There would be no impact to the safety of the traveling public. Due to the slope of the hill along the road segment, there would be no threat of a car running off the road into the shelter.

**Existing Infrastructure** – Power is available 100 feet from this location. A parking lot with limited access is adjacent to the site with an entrance on a public surface street. Internet service is currently run to a building about 200 feet away.

**Property Availability** – A Property Use Agreement has already been drawn up between the Public Library and Health Department. Library has already signed the document, Health is awaiting approval from EPA.

## Site Pictures

North-East – Pictured is the Metro Archive. Power will be available from the pole in the parking lot.



East



**South-East** – A large hackberry tree will be pruned to move the drip-line further from the proposed monitoring site.



**South** – The property is defined by a vegetation-covered, 5-ft chain link fence. The vegetation will be cleared and the fence replaced.



**South-West** - The property is defined by a vegetation-covered, 5-ft chain link fence. The vegetation will be cleared and the fence replaced.



**West** - The property is defined by a vegetation-covered, 5-ft chain link fence. The vegetation will be cleared and the fence replaced.



**North** – This picture shows some of the vegetation that will be cleared, along with some of the land, adjacent to the parking lot, that will be used for the monitoring shelter.



**North-West** – The restricted-access parking lot that will allow staff to transport equipment directly to the proposed site.



### **Additional Location Information**

**Proposed AQS ID** – 47-037-0040

**Site Location** – 1113 Elm Hill Pike, Nashville, Tennessee, 37210

**Coordinates** – lat 36.1424°, long -86.7341°

**Surrounding Land Use** – The vicinity surrounding the proposed site is primarily commercial/light industrial. There are no significant fuel burning sources in the immediate vicinity. There is roughly uniform land use within approximately 2 kilometers which would define it as a **Neighborhood Scale** of representativeness.

## **Pollutants and Sampling Methods**

**Nitrogen Dioxide** – Maximum hourly NO<sub>2</sub> will be sampled using a continuous chemiluminescent monitor meeting the Federal Reference Methods. The monitor would most likely be the Thermo TRACE Level NOx Analyzer, Model 42i-TL.

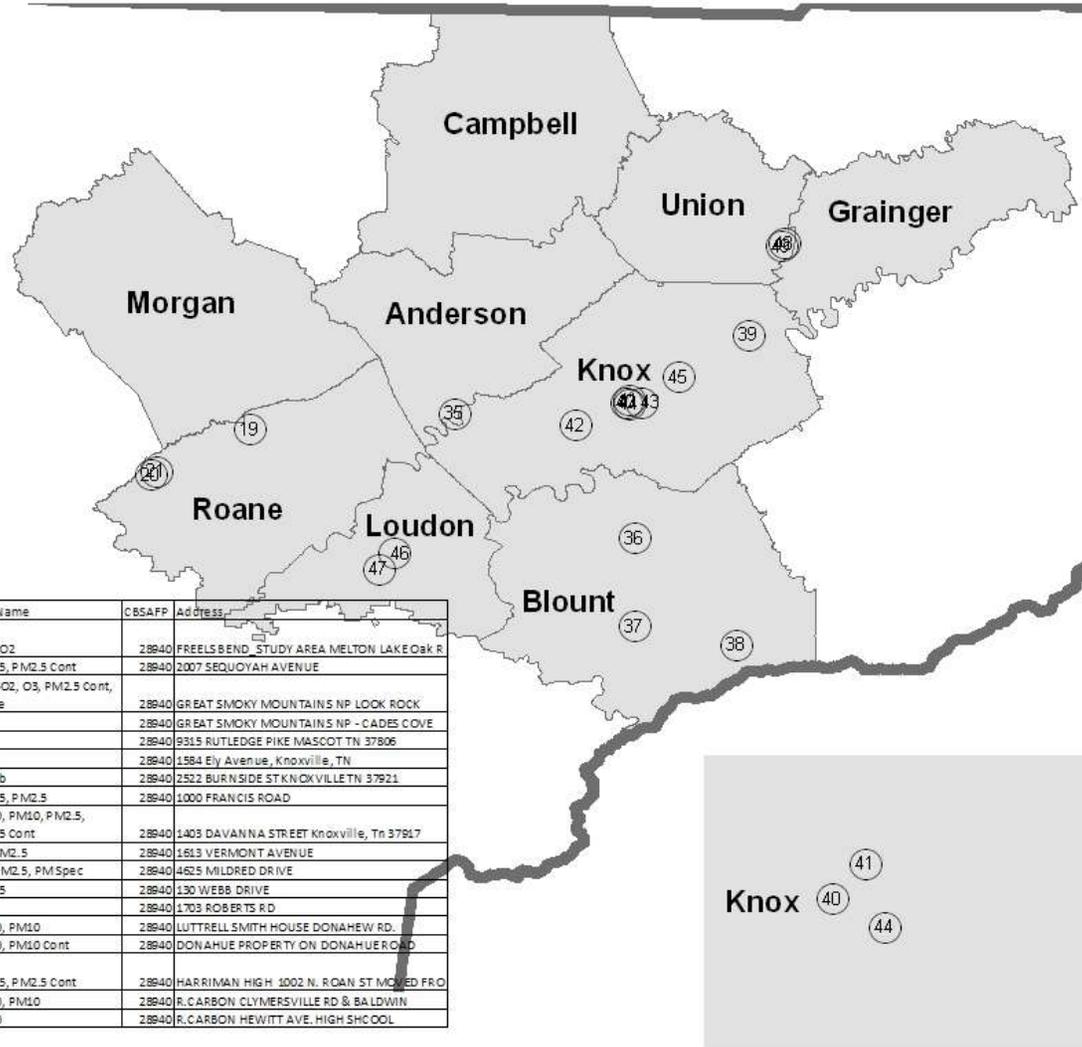
**Carbon Monoxide** – Maximum hourly CO will be sampled using a continuous gas filter correlation analyzer that meets the Federal Reference Method. The monitor would most likely be the Thermo CO Analyzer, Model 48i.

**Fine Particulate** – PM<sub>2.5</sub> may be monitored at this location in the future, if required.

**Meteorological Measurements** – The current plan is to have the shelter built with the proper tower for a met station, since retrofitting will not be cost effective. However, with a National Weather Service station operating at the Nashville International Airport, which is located approximately 3 kilometers from the proposed site, a final decision has not been made on whether the met station will be part of the final plan.

**Black Carbon** - Although the agency has not explored the technology associated with black carbon sampling, if it can be done within budget and does not add a sizeable burden to current staff, we are willing to explore this additional equipment.

# Knoxville, TN Area



**Tennessee'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 SO2		42602 NO2		44201 Ozone			81102 PM 10		88101 PM 2.5			88502 PM 2.5 Speciation		88101 or 88501 PM 2.5 Cont		
CBSA Code	Census 2000 / 2010	CBSA Title (MS Areas)	Operating	Required	Operating	Required	Operating	Required	Operating	Required	Operating	2010 2012 8 Hr DV	Required	Operating	Required	Operating	2010 2012 Annual DV ug/m	2010 2012 24 Hr DV ug/m	Required	Operating	Required	Operating	Required
28940	616079/698030	Knoxville, TN	4 <sup>1</sup>	2	1	0	2	1	1	0	6	0.079	2	5 <sup>1</sup>	2	7 <sup>1</sup>	12.2	24	1	1	1	3	1

<sup>1</sup> Includes collocated monitor.

The TEOM POC 3 PM2.5 particulate monitors and the speciation POC 5 STN monitors are generally not suited to be used for comparisons to the annual PM2.5 standards.

Knox County Department of Air Quality Management has requested the relocation of site 47-093-1013 to approximately 550 ft from current location. This relocation is pending approval.

Lead monitor 47-093-0023 located near Gerdau will be relocated. Gerdau secured closure of the right-of-way the monitor is located on. Once road construction is complete monitor will be relocated. Agency is working with EPA Region 4 to identify an acceptable monitoring site.

Knox County Department of Air Quality Management is requesting the addition of a new lead monitoring site to its network. This site should be listed as SLAMS and will be run by Gerdau-Knoxville Mill. This site will have two Hi-Vol TSP samplers; one as primary and one collocated. The site will be located on the East side of the plant along Tennessee Ave. The exact location of the site is still under negotiation.

An SO2 monitor was installed at the existing Freels Bend ozone site (470010101), to meet the PWEI requirements. The new monitoring site began reporting SO2 data February 8, 2013.

The need for additional monitoring sites may be met by re-location of existing network sites. Additional monitoring sites will require additional resources for both equipment and operational expenses.

**Revisions to the Knox County portions of the AMP provided courtesy of the Knox County Department of Air Quality Management.**

AQSID	County Name	Monitor Type	Para	Para Name	POC	Int	Year	Collection Frequency	Address	CBSA	Lat	Lon	Mtd	RepOrg	RepOrgName
470930021	Knox	SLAMS	44201	O3	1	1	2012	Hourly	9315 RUTLEDGE PIKE MASCOT TN 37806	28940	+36.085508	-83.764806	047	0581	Knox County Department Of Air Quality Management
470930027	Knox	SLAMS	14129	Pb	1	7	2012	6	2522 BURNSIDE ST KNOXVILLE TN 37921	28940	+35.983056	-83.952253	107	0581	Knox County Department Of Air Quality Management
470930027	Knox	SLAMS	14129	Pb	2	7	2012	6	2522 BURNSIDE ST KNOXVILLE TN 37921	28940	+35.983056	-83.952253	107	0581	Knox County Department Of Air Quality Management
470930028	Knox	SLAMS	88101	PM2.5	1	7	2012	1	1000 FRANCIS ROAD	28940	+35.944601	-84.035980	145	0581	Knox County Department Of Air Quality Management
470930028	Knox	SLAMS	88101	PM2.5	2	7	2012	1	1000 FRANCIS ROAD	28940	+35.944601	-84.035980	145	0581	Knox County Department Of Air Quality Management
470931013	Knox	SLAMS	81102	PM10	1	7	2012	6	1403 DAVANNA STREET Knoxville, Tn 37917	28940	+35.980421	-83.932814	064	0581	Knox County Department Of Air Quality Management
470931013	Knox	QA Collocated	81102	PM10	2	7	2012	6	1403 DAVANNA STREET Knoxville, Tn 37917	28940	+35.980421	-83.932814	064	0581	Knox County Department Of Air Quality Management
470931013	Knox	SPECIAL PURPOSE	88101	PM2.5	1	7	2012	6	1403 DAVANNA STREET Knoxville, Tn 37917	28940	+35.980421	-83.932814	145	0581	Knox County Department Of Air Quality Management
470931013	Knox	SPECIAL PURPOSE	88501	PM2.5 Cont	3	1	2012	Hourly	1403 DAVANNA STREET Knoxville, Tn 37917	28940	+35.980421	-83.932814	716	0581	Knox County Department Of Air Quality Management
470931017	Knox	SLAMS	14129	Pb	1	7	2012	6	1613 VERMONT AVENUE	28940	+35.978074	-83.950666	107	0581	Knox County Department Of Air Quality Management
470931017	Knox	SLAMS	88101	PM2.5	1	7	2012	1	1613 VERMONT AVENUE	28940	+35.978074	-83.950666	145	0581	Knox County Department Of Air Quality Management
470931020	Knox	SLAMS	44201	O3	1	1	2012	Hourly	4625 MILDRED DRIVE	28940	+36.019186	-83.873810	047	0581	Knox County Department Of Air Quality Management
470931020	Knox	SLAMS	88101	PM2.5	1	7	2012	1	4625 MILDRED DRIVE	28940	+36.019186	-83.873810	145	0581	Knox County Department Of Air Quality Management
470931020	Knox	SUPLMNTL SPECIATION	88502	PM Spec Carbon	5	7	2012	6	4625 MILDRED DRIVE	28940	+36.019186	-83.873810	810	0581	Knox County Department Of Air Quality Management
470930023	Knox	SLAMS	14129	Pb	1	7	2012	6	1584 ELY AVENUE	28940	+35.98049	-83.95422	107	0581	Knox County Department Of Air Quality Management
470090101	Blount	NON-EPA FEDERAL	44201	O3	1	1	2012	Hourly	GREAT SMOKY MOUNTAINS NP	28940	+35.631490	-83.943512	047	0745	National Park Service

AQSID	County Name	Monitor Type	Para	Para Name	POC	Int	Year	Collection Frequency	Address	CBSA	Lat	Lon	Mtd	RepOrg	RepOrgName
									LOOK ROCK						
470010101	Anderson	SLAMS	44201	O3	1	1	2012	Hourly	FREELS BEND_STUDY AREA MELTON LAKE	28940	+35.963273	-84.223234	087	1025	Tennessee Division Of Air Pollution Control
470010101	Anderson	SLAMS	42401	SO2	1	1	2013	Hourly	FREELS BEND_STUDY AREA MELTON LAKE	28940	+35.963273	-84.223234	100	1025	Tennessee Division Of Air Pollution Control
470090011	Blount	SPECIAL PURPOSE	88101	PM2.5	1	7	2012	3	2007 SEQUOYAH AVENUE	28940	+35.768431	-83.942123	118	1025	Tennessee Division Of Air Pollution Control
470090011	Blount	SPECIAL PURPOSE	88501	PM2.5 Cont	3	1	2012	Hourly	2007 SEQUOYAH AVENUE	28940	+35.768431	-83.942123	716	1025	Tennessee Division Of Air Pollution Control
470090101	Blount	SPECIAL PURPOSE	88501	PM2.5 Cont	3	1	2012	Hourly	GREAT SMOKY MOUNTAINS NP LOOK ROCK	28940	+35.631490	-83.943512	703	1025	Tennessee Division Of Air Pollution Control
470090102	Blount	NON-EPA FEDERAL	44201	O3	1	1	2012	Hourly	GREAT SMOKY MOUNTAINS NP - CADES COVE	28940	+35.603056	-83.783611	053	1025	Tennessee Division Of Air Pollution Control
471050108	Loudon	SPECIAL PURPOSE	88101	PM2.5	1	7	2012	3	130 WEBB DRIVE	28940	+35.744799	-84.317313	118	1025	Tennessee Division Of Air Pollution Control
471050109	Loudon	SPECIAL PURPOSE	44201	O3	1	1	2012	Hourly	1703 ROBERTS RD	28940	+35.720932	-84.341581	087	1025	Tennessee Division Of Air Pollution Control
471730107	Union	SPECIAL PURPOSE	81102	PM10 Cont	1	1	2012	Hourly	DONAHUE PROPERTY ON DONAHUE ROAD	28940	+36.224167	-83.714444	079	1025	Tennessee Division Of Air Pollution Control
471730105	Union	INDUSTRIAL	81102	PM10	1	7	2012	6	LUTTRELL SMITH HOUSE DONAHEW RD.	28940	+36.228145	-83.709615	063	1027	Tennessee Luttrell Lime
471730105	Union	INDUSTRIAL	81102	PM10	2	7	2012	6	LUTTRELL SMITH HOUSE DONAHEW RD.	28940	+36.228145	-83.709615	063	1027	Tennessee Luttrell Lime
470090101	Blount	SPECIAL PURPOSE	42101	CO	2	1	2012	Hourly	GREAT SMOKY MOUNTAINS NP LOOK ROCK	28940	+35.631490	-83.943512	055	1029	Tennessee Valley Authority
470090101	Blount	SPECIAL PURPOSE	42401	SO2	2	1	2012	Hourly	GREAT SMOKY MOUNTAINS NP LOOK ROCK	28940	+35.631490	-83.943512	560	1029	Tennessee Valley Authority
470090101	Blount	SPECIAL PURPOSE	42602	NO2	3	1	2012	Hourly	GREAT SMOKY MOUNTAINS NP LOOK ROCK	28940	+35.631490	-83.943512	599	1029	Tennessee Valley Authority
471450103	Roane	INDUSTRIAL	81102	PM10	1	7	2012	6	R.CARBON CLYMERSVILLE RD & BALDWIN	25340	+35.868153	-84.698258	063	0921	Horsehead Corp
471450103	Roane	INDUSTRIAL	81102	PM10	2	7	2012	6	R.CARBON CLYMERSVILLE RD & BALDWIN	25340	+35.868153	-84.698258	063	0921	Horsehead Corp
471450104	Roane	INDUSTRIAL	81102	PM10	1	7	2012	6	R.CARBON	25340	+35.873152	-84.689646	063	0921	Horsehead Corp

AQSID	County Name	Monitor Type	Para	Para Name	POC	Int	Year	Collection Frequency	Address	CBSA	Lat	Lon	Mtd	RepOrg	RepOrgName
									HEWITT AVE. HIGH SHCOOL						
471450004	Roane	SPECIAL PURPOSE	88101	PM2.5	1	7	2012	3	HARRIMAN HIGH 1002 N. ROAN ST MOVED FRO	25340	+35.938695	-84.543720	118	1025	Tennessee Division Of Air Pollution Control
471450004	Roane	SPECIAL PURPOSE	88501	PM2.5 Cont	3	1	2012	Hourly	HARRIMAN HIGH 1002 N. ROAN ST MOVED FRO	25340	+35.938695	-84.543720	716	1025	Tennessee Division Of Air Pollution Control
471451001	Roane	SPECIAL PURPOSE	14128	Pb	1	7	2012	6	199 Lake Shore Rd, Kingston TN 37763	25340	+35.916795	-84.503518	089	1025	Tennessee Division Of Air Pollution Control
471451001	Roane	SPECIAL PURPOSE	81102	PM10 Cont	1	1	2012	Hourly	199 Lake Shore Rd, Kingston TN 37763	25340	+35.916795	-84.503518	079	1025	Tennessee Division Of Air Pollution Control
471451001	Roane	NON-REGULATORY	88101	PM2.5 Cont	3	1	2012	Hourly	199 Lake Shore Rd, Kingston TN 37763	25340	+35.916795	-84.503518	170	1029	Tennessee Valley Authority
471453005	Roane	NON-REGULATORY	88101	PM2.5 Cont	3	1	2012	Hourly	1025 Swan Pond Road, Harriman, TN 37748	25340	+35.902566	-84.524061	170	1029	Tennessee Valley Authority
471453008	Roane	NON-REGULATORY	88101	PM2.5 Cont	3	1	2012	Hourly	540 Emory River Road, Harriman, TN 37748	25340	+35.907121	-84.497090	170	1029	Tennessee Valley Authority
471453009	Roane	NON-REGULATORY	88101	PM2.5 Cont	3	1	2012	Hourly	304 Windswept Lane, Kingston, TN 37763	25340	+35.889824	-84.517130	170	1029	Tennessee Valley Authority
471453013	Roane	NON-REGULATORY	88101	PM2.5 Cont	3	1	2012	Hourly	SWAN POND CIRCLE ROAD; HARRIMAN, TN 3774	25340	+35.925500	-84.516570	170	1029	Tennessee Valley Authority

AQSID	County Name	Monitor Type	Para	Para Name	Monitoring Instrument	Analysis	Ref Mtd ID	Monitor Objective Type	Dominant Source	Measurement Scale	Land Use Type	Location Setting	Date Site Established
470930021	Knox	SLAMS	44201	O3	Teledyne 400E	ULTRA VIOLET	EQOA-0992-087047	HIGHEST CONCENTRATION	NULL	URBAN SCALE	AGRICULTURAL	RURAL	6/1/1981
470930027	Knox	SLAMS	14129	Pb	PB-TSP/FLAMELESS AA	Flameless Atomic absorption (GFAA); 3M HNO3 Boil 30 min	EQL-0895-107	SOURCE ORIENTED	POINT	NEIGHBORHOOD	INDUSTRIAL	URBAN AND CENTER CITY	12/4/1994
470930027	Knox	SLAMS	14129	Pb	PB-TSP/FLAMELESS AA	Flameless Atomic absorption (GFAA); 3M HNO3 Boil 30 min	EQL-0895-107	SOURCE ORIENTED	POINT	NEIGHBORHOOD	INDUSTRIAL	URBAN AND CENTER CITY	12/4/1994
470930028	Knox	SLAMS	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	MOBILE	NEIGHBORHOOD	MOBILE	SUBURBAN	1/1/1999
470930028	Knox	SLAMS	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	MOBILE	NEIGHBORHOOD	MOBILE	SUBURBAN	1/1/1999
470931013	Knox	SLAMS	81102	PM10	SIERRA-ANDERSEN/GMW 321-B	GRAVIMETRIC	RFPS-1287-064	POPULATION EXPOSURE	MOBILE	NEIGHBORHOOD	MOBILE	URBAN AND CENTER CITY	1/1/1975
470931013	Knox	QA Colocated	81102	PM10	SIERRA-ANDERSEN/GMW 321-B	GRAVIMETRIC	RFPS-1287-064	POPULATION EXPOSURE	MOBILE	NEIGHBORHOOD	MOBILE	URBAN AND CENTER CITY	1/1/1975
470931013	Knox	SPECIAL PURPOSE	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	MOBILE	MIDDLE SCALE	MOBILE	URBAN AND CENTER CITY	1/1/1975
470931013	Knox	SPECIAL PURPOSE	88501	PM2.5 Cont	Thermo Scientific Series 1405 TEOM	TEOM Gravimetric 50 deg C		POPULATION EXPOSURE	MOBILE	MIDDLE SCALE	MOBILE	URBAN AND CENTER CITY	1/1/1975
470931017	Knox	SLAMS	14129	Pb	PB-TSP/FLAMELESS AA	Flameless Atomic absorption (GFAA); 3M HNO3 Boil 30 min	EQL-0895-107	POPULATION EXPOSURE	NULL	NULL	RESIDENTIAL	URBAN AND CENTER CITY	4/1/1978
470931017	Knox	SLAMS	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	MOBILE	NEIGHBORHOOD	RESIDENTIAL	URBAN AND CENTER CITY	4/1/1978
470931020	Knox	SLAMS	44201	O3	Teledyne 400E	ULTRA VIOLET	EQOA-0992-087047	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	MOBILE	SUBURBAN	1/1/1981
470931020	Knox	SLAMS	88101	PM2.5	R & P CO PLUS MODEL 2025PM	GRAVIMETRIC	RFPS-0498-	POPULATION EXPOSURE	MOBILE	NEIGHBORHOOD	MOBILE	SUBURBAN	1/1/1981

AQSID	County Name	Monitor Type	Para	Para Name	Monitoring Instrument	Analysis	Ref Mtd ID	Monitor Objective Type	Dominant Source	Measurement Scale	Land Use Type	Location Setting	Date Site Established
					SEQ		118						
470931020	Knox	SUPLMNTL SPECIATION	88502	PM Spec Carbon	MetOne Super SASS URG 3000	Gravimetric		POPULATION EXPOSURE	NULL	NULL	MOBILE	SUBURBAN	1/1/1981
470930023	Knox	SLAMS	14129	Pb	PB-TSP/FLAMELESS AA	Flameless Atomic absorption (GFAA); 3M HNO3 Boil 30 min	EQL-0895-107	POPULATION EXPOSURE	POINT	NULL	RESIDENTIAL	URBAN AND CENTER CITY	4/1/1978
470090101	Blount	NON EPA FEDERAL	44201	O3	THERMO ELECTRON 49	ULTRA VIOLET	EQOA-0880-047	UNKNOWN	AREA	NEIGHBORHOOD	FOREST	RURAL	1/1/1980
470010101	Anderson	SLAMS	44201	O3	API MODEL 400 OZONE ANALYZER	ULTRA VIOLET ABSORPTION	EQOA-0992-087	POPULATION EXPOSURE	AREA	URBAN SCALE	FOREST	RURAL	4/1/1992
470010101	Anderson	SLAMS	42401	SO2	Teledyne API M100 E	UV Fluorescence	EQSA-0495-100	POPULATION EXPOSURE	POINT	URBAN SCALE	FOREST	RURAL	02/09/2013
470090011	Blount	SPECIAL PURPOSE	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	5/1/2000
470090011	Blount	SPECIAL PURPOSE	88501	PM2.5 Cont		TEOM Gravimetric 50 deg C		POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	5/1/2000
470090101	Blount	SPECIAL PURPOSE	88501	PM2.5 Cont		TEOM Gravimetric 30 deg C		REGIONAL TRANSPORT	AREA	REGIONAL SCALE	FOREST	RURAL	1/1/1980
470090102	Blount	NON-EPA FEDERAL	44201	O3	MONITOR LABS 8810	ULTRA VIOLET	EQOA-0881-053	HIGHEST CONCENTRATION	NULL	REGIONAL SCALE	FOREST	RURAL	5/1/1994
471050108	Loudon	SPECIAL PURPOSE	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	8/1/2003
471050109	Loudon	SPECIAL PURPOSE	44201	O3	API MODEL 400 OZONE ANALYZER	ULTRA VIOLET ABSORPTION	EQOA-0992-087	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	2/1/2006
471730107	Union	SPECIAL PURPOSE	81102	PM10 Cont	RUPRCHT&PATSH NCK TEOM SER 1400	TEOM-GRAVIMETRIC	EQPM-1090-079	UNKNOWN	NULL	NULL	AGRICULTURAL	RURAL	10/25/1996
471730105	Union	INDUSTRIAL	81102	PM10	GMW Model 1200	GRAVIMETRIC	RFPS-1287-063	UNKNOWN	POINT	NULL	AGRICULTURAL	RURAL	3/1/1984
471730105	Union	INDUSTRIAL	81102	PM10	GMW Model 1200	GRAVIMETRIC	RFPS-1287-063	UNKNOWN	POINT	NULL	AGRICULTURAL	RURAL	3/1/1984
470090101	Blount	SPECIAL PURPOSE	42101	CO		Gas Filter Correlation Thermo Electron 48C-		UNKNOWN	NULL	NULL	FOREST	RURAL	1/1/1980

AQSID	County Name	Monitor Type	Para	Para Name	Monitoring Instrument	Analysis	Ref Mtd ID	Monitor Objective Type	Dominant Source	Measurement Scale	Land Use Type	Location Setting	Date Site Established
						TL							
470090101	Blount	SPECIAL PURPOSE	42401	SO2	Thermo Electron 43c-TLE/43i-TLE	Pulsed Fluorescent 43C-TLE/43i-TLE	EQSA-0486-060	UNKNOWN	NULL	NULL	FOREST	RURAL	1/1/1980
470090101	Blount	SPECIAL PURPOSE	42602	NO2		Chemiluminescence Teledyne API 200 EU/501w/photolytic converter		GENERAL/BACKGROUND	NULL	NULL	FOREST	RURAL	1/1/1980
471450103	Roane	INDUSTRIAL	81102	PM10	GMW Model 1200	GRAVIMETRIC	RFPS-1287-063	HIGHEST CONCENTRATION	POINT	NEIGHBORHOOD	INDUSTRIAL	SUBURBAN	1/1/1986
471450103	Roane	INDUSTRIAL	81102	PM10	GMW Model 1200	GRAVIMETRIC	RFPS-1287-063	UNKNOWN	POINT	NULL	INDUSTRIAL	SUBURBAN	1/1/1986
471450104	Roane	INDUSTRIAL	81102	PM10	GMW Model 1200	GRAVIMETRIC	RFPS-1287-063	HIGHEST CONCENTRATION	POINT	NEIGHBORHOOD	INDUSTRIAL	SUBURBAN	1/1/1986
471450004	Roane	SPECIAL PURPOSE	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	NULL	URBAN SCALE	INDUSTRIAL	SUBURBAN	1/1/1980
471450004	Roane	SPECIAL PURPOSE	88501	PM2.5 Cont		TEOM Gravimetric 50 deg C		POPULATION EXPOSURE	AREA	URBAN SCALE	INDUSTRIAL	SUBURBAN	1/1/1980
471451001	Roane	SPECIAL PURPOSE	14128	Pb		ICP/MS W/QUARTZ FILTER		SOURCE ORIENTED	POINT	MICROSCALE	AGRICULTURAL	RURAL	1/1/1958
471451001	Roane	SPECIAL PURPOSE	81102	PM10 Cont	RUPRCHT&PATSH NCK TEOM SER 1400	TEOM-GRAVIMETRIC	EQPM-1090-079	SOURCE ORIENTED	POINT	MICROSCALE	AGRICULTURAL	RURAL	1/1/1958
471451001	Roane	NON-REGULATORY	88101	PM2.5 Cont	Met One BAM-1020 PM2.5 VSCC FEM	Beta Attenuation	EQPM-0308-170	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	AGRICULTURAL	RURAL	1/1/1958
471453005	Roane	NON-REGULATORY	88101	PM2.5 Cont	Met One BAM-1020 PM2.5 VSCC FEM	Beta Attenuation	EQPM-0308-170	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	RURAL	1/1/2009
471453008	Roane	NON-REGULATORY	88101	PM2.5 Cont	Met One BAM-1020 PM2.5 VSCC FEM	Beta Attenuation	EQPM-0308-170	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	RURAL	1/1/2009
471453009	Roane	NON-REGULATORY	88101	PM2.5 Cont	Met One BAM-1020 PM2.5 VSCC FEM	Beta Attenuation	EQPM-0308-170	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	RURAL	1/1/2009
471453013	Roane	NON-REGULATORY	88101	PM2.5 Cont	Met One BAM-1020 PM2.5 VSCC FEM	Beta Attenuation	EQPM-0308-170	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	RURAL	4/26/2010

# Monitoring Equipment Evaluation Knox County Department of Air Quality Management AMP

## Knox County Air Quality Management Equipment Inventory 2013

Completed: 03/19/2013 by Amber Talgo

Air Lab Site: 47-093-1013	Description	Serial Number	Condition	Put in Service	Comments:
PM 2.5 Continuous	TEOM 1405	SN 1405A209531006	Good Condition	2011	
PM 2.5 Sequential	Thermo Partisol Plus 2025	SN B225760909	Good Condition	2010	
Data Logger	ESC 8832	SN A3760K	Good Condition	2010	
PM 10 Hi-Vol	Andersen/GMW	SN P3084	Good Condition	Unknown	
PM 10 Hi-Vol	Andersen/GMW	SN P999	Good Condition	Unknown	

Rule Site: 47-093-1017	Description	Serial Number	Condition	Put in Service	Comments:
PM 2.5 Sequential	Thermo Partisol Plus 2026	SN B26451005	Good Condition	2012	
TSP Hi-Vol	General Metal Works	SN P1938	Good Condition	Unknown	

Burnside Site: 47-093-0027	Description	Serial Number	Condition	Put in Service	Comments:
TSP Hi-Vol	General Metal Works	SN P2875	Good Condition	Unknown	
TSP Hi-Vol	Anderson/GMW	SN P4302	Good Condition	Unknown	

Ameristeel Site: 47-093-0023	Description	Serial Number	Condition	Put in Service	Comments:
TSP Hi-Vol	General Metal Works	SN P04304	Good Condition	Unknown	

Bearden Site: 47-093-0028	Description	Serial Number	Condition	Put in Service	Comments:
PM 2.5 Sequential	Thermo Partisol Plus 2025	SN B218930606	Good Condition	2007	
PM 2.5 Sequential	Thermo Partisol Plus 2025	SN B218940606	Good Condition	2007	

Spring Hill Site: 47-093-1020	Description	Serial Number	Condition	Put in Service	Comments:
PM 2.5 Sequential	Thermo Partisol Plus 2025	SN B218980606	Good Condition	2007	
Carbon Sampler	URG 3000N	SN 3N-B0285	Good Condition	2007	
PM 2.5 Speciation	Met One Super SASS	SN G9188	Good Condition	2008	
Ozone Analyzer	Teledyne / API 400E	2013	Good Condition	2009	
Ozone Calibrator	Teledyne / API 703E	187	Good Condition	2009	
Data Logger	ESC 8832	A 3758 K	Good Condition	2010	
Gist (pump for 0 air)	DOA-P704-AA	0611014883	Good Condition	2011	

East Knox Site: 47-093-0021	Description	Serial Number	Condition	Put in Service	Comments:
Ozone Analyzer	Teledyne / API 400E	2014	Good Condition	2009	
Ozone Calibrator	Teledyne / API 703E	190	Good Condition	2009	
Data Logger	ESC 8832	A 3757 K	Good Condition	2010	
Gist (pump for 0 air)	DOA-P704-AA	0611014884	Good Condition	2011	

### Back-up equipment

Located at the Air Lab	Description	Serial Number	Condition	Put in Service	Comments:
Ozone Analyzer	Teledyne / API 400E	2259	Good Condition	2009	
Ozone Analyzer	Teledyne / API 400E	2697	Good Condition	2011	Bench standard
Ozone Calibrator	Teledyne / API 703E	189	Good Condition	2009	
Ozone Calibrator	Teledyne / API 703E	188	Good Condition	2009	For audit use
Data Logger	ESC 8832	A 3759 K	Good Condition	2010	
Gist (pump for 0 air)	DOA-P704-AA	0611013627	Good Condition	2011	For Audit use
Thermo Environmental Inst.	111	111-46018-275	Fair		
Gist (compressor)	1HAB-11T-M100X	0993	Condition	Unknown	
PM 2.5 Sequential	Thermo Partisol Plus 2025	SN B218920606	Poor Condition	2007	being scavanged
PM 2.5 Sequential	Thermo Partisol Plus 2025	SN B218950606	Moderate Condition	2007	
TSP Hi-Vol	General Metal Works	SN P3085	Good Condition	Unknown	
Hi-Vol Orifice	Anderson/GMW	P3619	Good Condition	Unknown	
Hi-Vol Orifice	Anderson/GMW	P2861	Good Condition	Unknown	
Hi-Vol Orifice	Anderson/GMW	P4306	Good Condition	Unknown	
Hi-Vol Orifice	Anderson/GMW	P3927	Good Condition	Unknown	
PM 10 inlet head for Hi-Vol	Anderson/GMW	3555	Good Condition	Unknown	
PM 10 inlet head for Hi-Vol	Anderson/GMW	3874	Good Condition	Unknown	in mosquito garage
PM 10 inlet head for Hi-Vol	Anderson/GMW	3079	Good Condition	Unknown	in mosquito garage
PM 10 inlet head for Hi-Vol	Anderson/GMW	1536	Poor Condition	Unknown	in mosquito garage

### Discontinued / Out of Service

Located at the Air Lab	Description	Serial Number	Condition	Put in Service	Comments:
SO <sub>2</sub> Analyzer	Thermo 43A	43A-39269-262	Unknown	N/A	
Gas calibrator	Thermo 146	146-45988-275	Unknown	N/A	
BIOS (Air Pro Sentry II)	SR-24-6-115A	SR 50018	Unknown	N/A	
BIOS (Air Pro Sentry II)	SR-24-6-115A	SR 50019	Unknown	N/A	
PM 2.5 Sequential	Anderson- RAAS	RAAS2.5-300-00124	Non-working Condition	N/A	Mostly disassembled
PM 2.5 Sequential	Anderson- RAAS	RAAS2.5-300-00166	Non-working Condition	N/A	Mostly disassembled
PM 2.5 Sequential	Anderson- RAAS	RAAS2.5-300-00497	Poor Condition	N/A	
PM 2.5 Sequential	Anderson- RAAS	RAAS2.5-300-00137	Non-working Condition	N/A	Mostly disassembled
PM 2.5 Sequential Speciation	Anderson- RAAS	RAAS2.5-401-00264	Non-working Condition	N/A	Mostly disassembled
PM 2.5 Sequential Speciation	Anderson- RAAS	RAAS2.5-401-00025	Non-working Condition	N/A	Mostly disassembled
Ozone analyzer	Thermo 49	49-50547-285	???	N/A	
Ozone analyzer	Thermo 49	49-29875-237	???	N/A	
Ozone Calibrator	Thermo 49CPS	49CPS-55290-303	???	N/A	Bench Standard
Zero Air Supply	ESC 116-7700P	0139	Non-working Condition	N/A	Mostly disassembled
Zero Air Supply	ESC 116-7700P	0142	Non-working Condition	N/A	Mostly disassembled

## **NCore Look Rock Monitoring Site**

Air quality monitoring at the Look Rock monitoring site has a long history dating at least back to about 1980. Monitoring at this site has been a joint effort of the National Park Service (NPS) Tennessee Valley Authority (TVA) and the State of Tennessee.

### **Siting**

The coordinates are:  
Latitude + 35.6334N  
Longitude -83.9416W  
Elevation 801 Meters.

Site is approved by the EPA as a rural NCore site.

### **Monitoring Objective**

Determine compliance with NAAQS; observe pollution trends for national data analysis, provide pollution levels for daily index reporting; and provide data for scientific studies.

### **Quality Assurance**

All Quality Assurance procedures shall be implemented in accordance with 40 CFR 58, Appendix A.

### **Area of Representativeness**

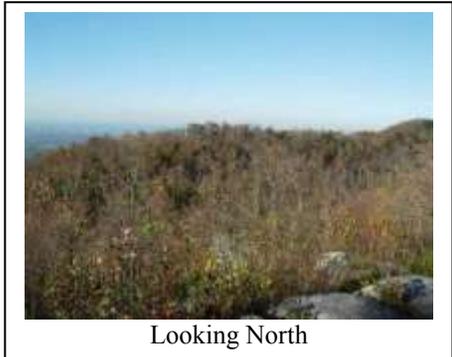
40 CFR Part 58 Appendix D provides design criteria for ambient air monitoring. In the case of urban NCore the spatial scales to be used are neighborhood and urban. Because the Look Rock site is located in a pristine high elevation area, it is understood that the site is ideally suited for both background and transport related measurements..

### **Spatial Scales for Each Pollutant**

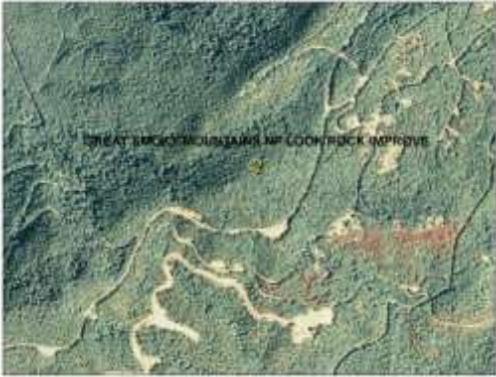
Generally regional scale.

### **Need For Additional Resources**

All parties agree that the collaboration between the National Park Service, TVA and the State of Tennessee at the Look Rock sampling site has produced an extraordinarily diverse and in-depth air quality record and that the bulk of this data set has been validated and reported to the U.S. EPA AQS repository. However, under the present piecemeal funding by the various agencies, there is no assurance that this will continue at the site for the longer term needed for monitoring compliance with the PM NAAQS and with the regional haze rule (RHR). What is needed is a long-term commitment by EPA to coordinate the operation of this and other sites to maintain quality and relevance in the NCore network over the long term. This commitment should commence by the 2011 time frame when NCore sites are expected to become fully operational.



Looking North



Looking West



2011 View of Look Rock Site



Looking East



Looking South

Current TVA Air Monitoring Equipment at Look Rock  
(2013 equipment unchanged from 2012 list provided)

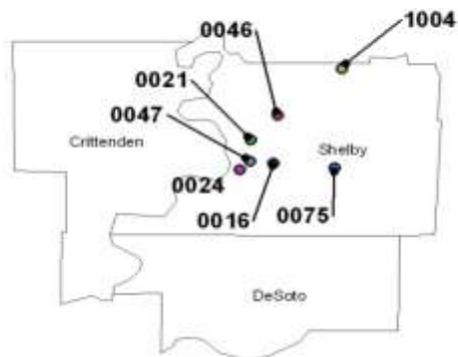
**Current TVA Air Monitoring at Look Rock**  
Updated by Solomon T. Bairai, March 14, 2012

POLLUTANT / INSTRUMENT	ANALYSIS METHOD	SAMPLING / REPORTING FREQ	AQS CODE	PARA METER CODE	POC	REP ORG CODE	DATE SAMPLING BEGAN	MONITOR		SAMPLING INSTRUMENT NAME AND DESIGNATION	FED AGENCY
								Type	Comment		
Sulfur dioxide (SO <sub>2</sub> ) trace-level	Pulsed fluorescence	Continuous/ 1 hour	47-009-0101	42401	2	1029	20070401	Special Purpose	NCore	Thermo SO <sub>2</sub> 43i-TLE EQSA-0486-060	TVA
Carbon monoxide (CO)	trace-level NDIR-GFC	Continuous/ 1 hour	47-009-0101	42101	2	1029	20070401	Special Purpose	NCore	Thermo CO-48i TLE RFCA-0981-054	TVA
<sup>1</sup> Nitrogen oxide (NO) trace-level	Chemiluminescence with molybdenum converter	Continuous/ 1 hour	47-009-0101	42601	2	1029	20070401	Special Purpose	NCore	Thermo NO/NO <sub>y</sub> 42C TLE RFNA-1289-074	TVA
<sup>1</sup> Total reactive nitrogen (NO <sub>y</sub> ) trace-level	Chemiluminescence with molybdenum converter	Continuous/ 1 hour	47-009-0101	42603	2	1029	20070401	Special Purpose	NCore	Thermo NO/NO <sub>y</sub> 42C TLE RFNA-1289-074	TVA
<sup>1</sup> Nitrogen oxide (NO) trace-level	Chemiluminescence with photolytic converter	Continuous/ 1 hour	47-009-0101	42601	3	1029	20081001	Special Purpose	NCore	Teledyne NO/NO <sub>2</sub> /NO <sub>x</sub> 200EU with photolytic converter	TVA
<sup>1</sup> Nitrogen dioxide (NO <sub>2</sub> ) trace-level	Chemiluminescence with photolytic converter	Continuous/ 1 hour	47-009-0101	42602	3	1029	20081001	Special Purpose	NCore	Teledyne NO/NO <sub>2</sub> /NO <sub>x</sub> 200EU with photolytic converter	TVA
<sup>1</sup> Oxides of Nitrogen (NO <sub>x</sub> ) trace-level	Chemiluminescence with photolytic converter	Continuous/ 1 hour	47-009-0101	42603	3	1029	20081001	Special Purpose	NCore	Teledyne NO/NO <sub>2</sub> /NO <sub>x</sub> 200EU with photolytic converter	TVA
<sup>1</sup> Black carbon PM <sub>2.5</sub> LC	Optical absorption	Continuous/ 1 hour	47-009-0101	88313	2	1029	20061001	Special Purpose	NCore	Magee Scientific AE21 Dual beam (BC/UV)	TVA
<sup>1</sup> Sulfate PM <sub>2.5</sub> LC	Thermal reduction/ Pulsed fluorescence	Continuous/ 1 hour	47-009-0101	88403	2	1029	20061108	Special Purpose	NCore	Thermo Model 5020	TVA
PM <sub>2.5</sub> Mass	Beta Attenuation	1 hour	47-009-0101	88101	NA	1029	20110128	Special purpose	NCore	BAM-1020	TVA
PM <sub>10</sub> Mass	Beta Attenuation	1 hour	47-009-0101	81102	NA	1029	20110128	Special purpose	NCore	BAM-1020	TVA
<sup>1</sup> Calibrator	NA	Daily	NA	NA	NA	NA	20070401	NA	NA	Thermo Model 146C	TVA
<sup>1</sup> Zero Air Supply	NA	NA	NA	NA	NA	NA	20070401	NA	NA	Thermo 111	TVA
<sup>1</sup> Telemetry-Data Logger	NA	1 minute/1 hour	NA	NA	NA	NA	20070401	NA	NA	ESC 8832	TVA

## Memphis, TN-MS-AR MSA Area

<u>AQS ID</u>	<u>Pollutant</u>	<u>Parameter</u>	<u>ROC*</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Address</u>	<u>CBSA 2003 Title</u>
47-157-0016	PM 10 (Collocated)	81102	0673	+35.165636	-89.970810	1060 Tupelo (Gas Service Center)	Memphis, TN-MS-AR
47-157-0021	Ozone	44201	0673	+35.217501	-90.019707	1330 Frayser	Memphis, TN-MS-AR
47-157-0024	CO, PM 2.5 Continuous, PM 2.5 Speciation, PM 10 (relocated from Fite)	42101, 88502, 81102	0673	+35.151194	-90.041559	416 Alabama	Memphis, TN-MS-AR
47-157-0046 Site discontinued 12/31/12	SO2, PM 10	42401, 81102	0673	+35.273460	-89.961217	3065 Fite Rd.	Memphis, TN-MS-AR
47-157-0047	PM 2.5 (Collocated)	88101	0673	+35.168894	-90.021537	1064 Breedlove (Guthrie Clinic)	Memphis, TN-MS-AR
47-157-0075	NCORE: CO (trace), NOY, O <sub>3</sub> , Pb, PM 2.5, PM 2.5 Continuous, PM 2.5 Speciation, PM 10 lo vol, PM 10-2.5, SO2 (trace), Wind Speed, Wind Direction, Temp, % Relative Humidity, Barometric Pressure	42101, 42600, 44201, 14129, 88101, 88502, 88502, 85101, 86101, 42401, 61101, 61102, 62101, 62201, 64101	0673	+35.151699	-89.850249	6388 Haley Rd. (Shelby Farms)	Memphis, TN-MS-AR
47-157-1004	Ozone	44201	0673	+35.378047	-89.834387	6855 Mudville Rd. (Edmund Orgill Park)	Memphis, TN-MS-AR

\*Reporting Organization Code  
0673 Memphis/Shelby County Health Department



**Tennessee'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 SO2		42602 NO2		44201 Ozone			81102 PM 10		88101 PM 2.5			88502 PM 2.5 Speciation		88101 or 88501 PM 2.5 Cont			
CBSA 2003 Code	Census 2010 /Est. 2011	CBSA 2003 Title (MS Areas)	Operating	Required	Operating	Required	Operating	Required	Operating	Required	Operating	2010-2012 8 Hr DV	Required	Operating	Required	Operating	2010 - 2012 Annual DV ug/m <sup>3</sup>	2010 - 2012 24 Hr DV ug/m <sup>3</sup>	Required	Operating	Required	Operating	Required	
32820	1316100/1325605	Memphis, TN-MS-AR	1	1	2 <sup>3</sup>	1	1 <sup>3*</sup>	1	1 <sup>1,4</sup>	1	3	0.079 Frayser	2	2 <sup>2*</sup>	2 - 4	2 <sup>1,2</sup>	10.3 Guthrie	20.4 Guthrie	2	2 <sup>5</sup>	1	1	1	1 - 2

<sup>1</sup>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 31 in the Appendix.

<sup>2</sup> Includes collocated monitor at Gas Service Center

<sup>3</sup> Includes trace level analyzer at Shelby Farms NCORE.

<sup>4</sup> Monitor located in Marion, Arkansas just to the northwest of downtown Memphis.

<sup>5</sup> EPA has requested the discontinuance of the PM 2.5 STN at the Alabama Station effective January 28, 2013. Official letter from EPA has not been received. See Shelby County submittal letter on page 40 in the Appendix.

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 monitors and the speciation POC 5 and 6 STN monitors are generally not suited to be used for comparisons to the annual PM 2.5 standards.

Shelby County Health Department is in the Second Phase of the Core Based Statistical Area Near Road NO<sub>2</sub> monitoring. The station will include equipment for multi-pollutant monitoring also. A site location has been selected on the campus of Southwest Tennessee Community College. A preliminary approval was given by EPA on the original location but the site has been moved approximately 20 feet to the west of the location per request by the Tennessee Board of Regents to allow for further expansion of the parking lot.

\*Fite Rd. (47-157-0046) has been approved by EPA to be discontinued. The PM 10 has been relocated to the Alabama Station (47-157-0024) and the SO<sub>2</sub> monitor has been discontinued. See EPA approval letter on page 39 in the Appendix.

### Local Program Monitors Criteria Data Tables

<u>AQS Code</u>	<u>Parameter</u>	<u>POC</u>	<u>ROC</u>	<u>Date Sampling Began</u>	<u>Operating Schedule</u>	<u>CBSA</u>	<u>Population of CBSA 2011 Est</u>	<u>Population of CBSA 2010 Census</u>	<u>Land Use</u>	<u>Location Setting</u>	<u>Dominant Source</u>	<u>Measurement Scale</u>	<u>Monitor Objective</u>	<u>Monitor Type</u>	<u>Sampling Instrument Name and Designation</u>
471570016	81102	1	0 6 7 3	01/01/1986	1 in 6	32820	1,325,605	1,316,100	Industrial	Urban and Center City	Area	Neighborhood	Highest Concentration	SLAMS	Sierra-Andersen/GMW 321-BRFPS-1287-064 064
471570016	81102	2	0 6 7 3	01/01/1986	1 in 6	32820	1,325,605	1,316,100	Industrial	Urban and Center City	Area	Neighborhood	Highest Concentration	QA Collocated	Sierra-Andersen/GMW 321-BRFPS-1287-064 064
471570021	44201	1	0 6 7 3	09/01/1972	Continuous	32820	1,325,605	1,316,100	Residential	Suburban	Area	Neighborhood	Population Exposure	SLAMS	Advanced Pollution Instrumentation 400/400A/400E EQAO-0992-087 087
471570024	42101	1	0 6 7 3	04/01/2006	Continuous	32820	1,325,605	1,316,100	Residential	Suburban	Mobile	Micro scale	Highest Concentration	SLAMS	Teledyne Advanced Pollution Instrumentation 300 or 300E RFCA-1093-093-093
471570024 (temporarily discontinued on July 24, 2011)	88502	3	0 6 7 3	01/01/2006 to 07/24/2011	Continuous	32820	1,325,605	1,316,100	Residential	Suburban	Area	Neighborhood	Population Exposure	SLAMS	R&P TEOM Gravimetric 50 degrees Celsius PM 2.5 SSI w/No Correction Factor 711
471570024 (discontinued January 28, 2013)	88502	5	0 6 7 3	05/14/2006	1 in 6	32820	1,325,605	1,316,100	Residential	Suburban	Area	Neighborhood	Population Exposure	TRENDS SPECIATION	Met One SASS 810 URG 3000N

<u>AQS Code</u>	<u>Parameter</u>	<u>POC</u>	<u>ROC</u>	<u>Date Sampling Began</u>	<u>Operating Schedule</u>	<u>CBSA</u>	<u>Population of CBSA 2011 Est</u>	<u>Population of CBSA 2010 Census</u>	<u>Land Use</u>	<u>Location Setting</u>	<u>Dominant Source</u>	<u>Measurement Scale</u>	<u>Monitor Objective</u>	<u>Monitor Type</u>	<u>Sampling Instrument Name and Designation</u>
471570046 (discontinued January 31, 2012)	42401	1	0 6 7 3	05/01/1994	Continuous	32820	1,325,605	1,316,100	Industrial	Suburban	Mobile	Urban Scale	MAX PRECURSOR EMISSIONS IMPACT	SLAMS	Advanced Pollution Instrumentation 100A/100AS ESA-0495-100 100
471570046 (relocated to 471570024)	81102	1	0 6 7 3	01/04/13	1 in 6	32820	1,325,605	1,316,100	Residential	Suburban	Area	Neighborhood	Population Exposure	SLAMS	Sierra-Andersen/GMW 321-B RFPS-1287-064 064
471570047	88101	1	0 6 7 3	12/01/1998	1 in 1	32820	1,325,605	1,316,100	Residential	Suburban	Area	Neighborhood	Population Exposure	SLAMS	R&P Partisol Plus FRM 2025 PM 2.5 RFPS-0498-118 118
471570047	88101	2	0 6 7 3	12/01/1998	1 in 6	32820	1,325,605	1,316,100	Residential	Suburban	Area	Neighborhood	Population Exposure	SLAMS	R&P Partisol Plus FRM 2025 PM 2.5 RFPS-0498-118 118
471570075	14129	1	0 6 7 3	01/01/2012	1 in 6	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood and Urban Scale	Population Exposure	NCORE	Sierra Andersen/GMW 350 RFPS-1087-062 062
471570075	42101	1	0 6 7 3	04/01/2011	Continuous	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood and Urban Scale	Population Exposure	NCORE	Teledyne Advanced Pollution Instrumentation 300EU RFCA-1093-093

<u>AQS Code</u>	<u>Parameter</u>	<u>POC</u>	<u>ROC</u>	<u>Date Sampling Began</u>	<u>Operating Schedule</u>	<u>CBSA</u>	<u>Population of CBSA 2011 Est</u>	<u>Population of CBSA 2010 Census</u>	<u>Land Use</u>	<u>Location Setting</u>	<u>Dominant Source</u>	<u>Measurement Scale</u>	<u>Monitor Objective</u>	<u>Monitor Type</u>	<u>Sampling Instrument Name and Designation</u>
471570075	42401	1	0 6 7 3	06/21/2011	Continuous	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood and Urban Scale	Population Exposure	NCORE	Teledyne Advanced Pollution Instrumentation 100EU EQSA-0495-100
471570075	42600	1	0 6 7 3	06/17/2011	Continuous	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood	Population Exposure	NCORE	Teledyne Advanced Pollution Instrumentation 200EU RFNA-1194-099
471570075	44201	1	0 6 7 3	03/11/2011	Continuous	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood and Urban Scale	Population Exposure	NCORE	Teledyne Advanced Pollution Instrumentation 400E/400/400A EQOA-0992-087
471570075	85101	1	0 6 7 3	01/16/2012	Continuous	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood and Urban Scale	Population Exposure	NCORE	R&P Partisol Plus FRM 2025 PM 10 RFPS-1298-127
471570075	86101	1	0 6 7 3	01/16/2012	1 in 3	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood and Urban Scale	Population Exposure	NCORE	R&P Partisol Plus FRM 2025 PM 10-2.5 RFPS-0509-176
471570075	88101	1	0 6 7 3	02/23/2011	1 in 3	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood and Urban Scale	Population Exposure	NCORE	R&P Partisol Plus FRM 2025 PM 2.5 RFPS-0498-118

<u>AQS Code</u>	<u>Parameter</u>	<u>POC</u>	<u>ROC</u>	<u>Date Sampling Began</u>	<u>Operating Schedule</u>	<u>CBSA</u>	<u>Population of CBSA 2011 Est</u>	<u>Population of CBSA 2010 Census</u>	<u>Land Use</u>	<u>Location Setting</u>	<u>Dominant Source</u>	<u>Measurement Scale</u>	<u>Monitor Objective</u>	<u>Monitor Type</u>	<u>Sampling Instrument Name and Designation</u>
471570075	88502	3	0 6 7 3	04/08/2011	Continuous	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood and Urban Scale	Population Exposure	NCORE	R&P TEOM Gravimetric 50 degrees Celsius PM 2.5 SSI w/No Correction Factor 711
471570075	88502	6	0 6 7 3	02/08/2011	1 in 3	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood and Urban Scale	Population Exposure	NCORE	Met One SASS 810 URG 3000N
471570075	61101	1	0 6 7 3	07/01/2012	Continuous	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood and Urban Scale	Population Exposure	NCORE	Met One Sonic Anemometer Model 50.5
471570075	61102	1	0 6 7 3	07/01/2012	Continuous	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood and Urban Scale	Population Exposure	NCORE	Met One Sonic Anemometer Model 50.5
471570075	62101	1	0 6 7 3	07/01/2012	Continuous	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood and Urban Scale	Population Exposure	NCORE	Met One 083D
471570075	62201	1	0 6 7 3	07/01/2012	Continuous	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood and Urban Scale	Population Exposure	NCORE	Met One 083D

<u>AQS Code</u>	<u>Parameter</u>	<u>POC</u>	<u>ROC</u>	<u>Date Sampling Began</u>	<u>Operating Schedule</u>	<u>CBSA</u>	<u>Population of CBSA 2011 Est</u>	<u>Population of CBSA 2010 Census</u>	<u>Land Use</u>	<u>Location Setting</u>	<u>Dominant Source</u>	<u>Measurement Scale</u>	<u>Monitor Objective</u>	<u>Monitor Type</u>	<u>Sampling Instrument Name and Designation</u>
471570075	64101	1	0673	07/01/2012	Continuous	32820	1,325,605	1,316,100	Industrial	Urban	Area	Neighborhood and Urban Scale	Population Exposure	NCORE	Climatronics Met Sensor
471571004	44201	1	0673	02/01/1980	Continuous	32820	1,325,605	1,316,100	Agricultural	Rural	Mobile	Urban	Highest Concentration	SLAMS	Advanced Pollution Instrumentation 400/400A/400E EQOA-0992-087 087

\*Reporting Organization Code (ROC) – 0673 Memphis/Shelby County Health Department

***Ambient Air Monitoring Work Plan  
for  
Near Road NO<sub>2</sub> Air Monitoring Station  
Memphis, TN-MS-AR MSA***

***Shelby County Health Dept.  
Air Pollution Control  
814 Jefferson Avenue Room 438R  
Memphis, TN 38105***



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

## **Near Road NO2 Air Monitoring Station**

In February 2010, the U.S. Environmental Protection Agency (EPA) amended its National Ambient Air Quality Standard (NAAQS) for Nitrogen Dioxide (NO<sub>2</sub>). In this rule, EPA required changes to the monitoring network that will focus monitoring resources to capture short-term NO<sub>2</sub> concentrations near heavily trafficked roads, to assess area-wide (or community-wide) NO<sub>2</sub> concentrations, and to assess NO<sub>2</sub> concentrations for vulnerable and susceptible populations. In the new monitoring requirements, state and local air monitoring agencies are required to install near-road NO<sub>2</sub> monitoring stations at locations where peak hourly NO<sub>2</sub> concentrations are expected to occur within the near-road environment in larger urban areas. State and local agencies are required to utilize six factors in the site selection process: traffic volumes, fleet mix, roadway design, traffic congestion patterns, local terrain or topography and meteorology. In addition, there are other factors that affect the selection and implementation of a near-road monitoring station, including satisfying siting criteria, favorable site logistics (e.g., gaining access to property and safety), and consideration of population exposure. In August 2011, EPA revised the NAAQS for carbon monoxide to also require a near-road monitor.

## **Site Selection and Ranking Information**

In 40 CFR Part 58 Appendix D, the EPA requires state and local air agencies to operate one near-road NO<sub>2</sub> monitor in any Core Based Statistical Area (CBSA) with a population of 500,000 or more persons. Those CBSAs with 2,500,000 or more persons or those CBSAs with one or more roadway segments carrying traffic volumes of 250,000 or more vehicles (as measured by annual average daily traffic (AADT) counts, should have two near-roads NO<sub>2</sub> monitors. According to the 2010 U.S. Census Bureau, the Memphis-Crittenden-Desoto counties statistical area population is 1,316,100. The highest AADT for a Memphis road segment is 140,850 according to data obtained from the 2007 U. S. Federal Highway Administration's Freight Analysis Framework. Since the population is between 500,000 and 2,500,000 and the maximum AADT is less than 250,000, only one near-road NO<sub>2</sub> monitor will be required in the CBSA.

Road segments were sorted based on AADT and FE-AADT and ranked from highest to lowest. The resulting ranking process is found in Table 1. The Shelby County Assessor of Property maps were used to determine the owner of each property of these road segments. Google Earth was used to determine the Tennessee Department of Transportation (TDOT) right-of-way (R.O.W.) that may be accessible by surface roads. Potential sites were identified and visited to determine whether the road segments would be possible candidates for a near-road monitoring station. The road segment that should meet all of the criteria established by the EPA is highlighted in Table 1.

**Table 1: Rankings of Road Segments in Shelby County based on 2007 FE-AADT from the U.S. Federal Highway Administration’s Freight Analysis Framework.**

Roadway	From	To	AADT	AADT Rank	Heavy Duty AADT	2007 FE-AADT	% Top FE-AADT	FE-AADT Rank
I-40	Summer	I-240	130,278	2	24,752	353,046	100	1
I-40	I-240	Sycamore View	140,850	1	16,902	292,968	83	2
I-40	Jackson Ave at Dr. Martin Luther King Expressway	U.S.51 at I-240 Interchange at Exit 2A Millington St.	112,138	6	16,820	263,518	75	3
I-40	Sycamore View	Germantown Pkwy	105,227	7	16,836	256,751	73	4
I-40	Covington Pike	Summer Ave.	95,130	9	18,074	257,796	73	5
I-40	I-69	Jackson Ave.	116,938	5	15,201	253,747	72	6
I-240	I-55 @ I-240	Elvis Presley	104,774	8	15,716	246,218	70	7
I-40	Austin Peay Hwy	Covington Pike	87,860	11	16,639	238,097	67	8
I-40	Exit Ramp 3	Jackson Ave.	89,175	10	15,159	225,606	64	9
I-240 *	Ridgeway Rd @ Bill Morris Pkwy	I-240 ramp	129,980	3	9,098	211,862	60	
I-240	S. Third St.	I-55 @ I-240	82,463	12	14,018	208,625	59	10
I-240 **	Airways Blvd.	I-55	123,840	4	7,430	190,710	54	
I-40 ***	St. Jude Exit	Danny Thomas Blvd.	58,553	13	11,710	163,943	46	

\* Highway 385 @ I-240

\*\* Old Hernando DOT Air Monitoring Station

\*\*\* Current Alabama Air Monitoring Station

Note: The road segments marked with asterisks were reviewed because they were either past or current monitoring sites or locations where officials in local government requested additional information.

A site along the campus of Southwest Tennessee Community College located at 5983 Macon Cove has been selected for a potential location.

The coordinates are:

Latitude 35.161264 N  
Longitude -89.870646 W  
Elevation 251 feet

## **Monitoring Objective**

To determine compliance with the NAAQS, observe pollution trends for national data analysis, provide pollution levels for daily index reporting and provide data for scientific studies

### **Monitors**

**Nitrogen Dioxide** - Maximum hourly NO<sub>2</sub> will be sampled using a continuous chemiluminescent monitor meeting the Federal Reference Methods.

**Carbon Monoxide** – Maximum hourly CO will be sampled using a continuous gas filter correlation analyzer that meets the Federal Reference Methods.

**Particulate Matter** – Continuous PM<sub>2.5</sub> monitoring may be monitored at this location in the future using the tapered element oscillating microbalances (TEOMs) method.

**Meteorological Measurements** – There are no plans to install a met station at this location because there is met data already being collected at the NCORE site which is approximately 1.8 miles southeast of this potential location.

Other types of non-regulatory monitors will be considered based on the availability of purchase money and staff resources to meet EPA's objective of multi pollutant monitoring in the near-road environment. Monitors to be considered include monitoring for traffic counts, ultra fine particles, and black carbon.

## **Area of Representativeness**

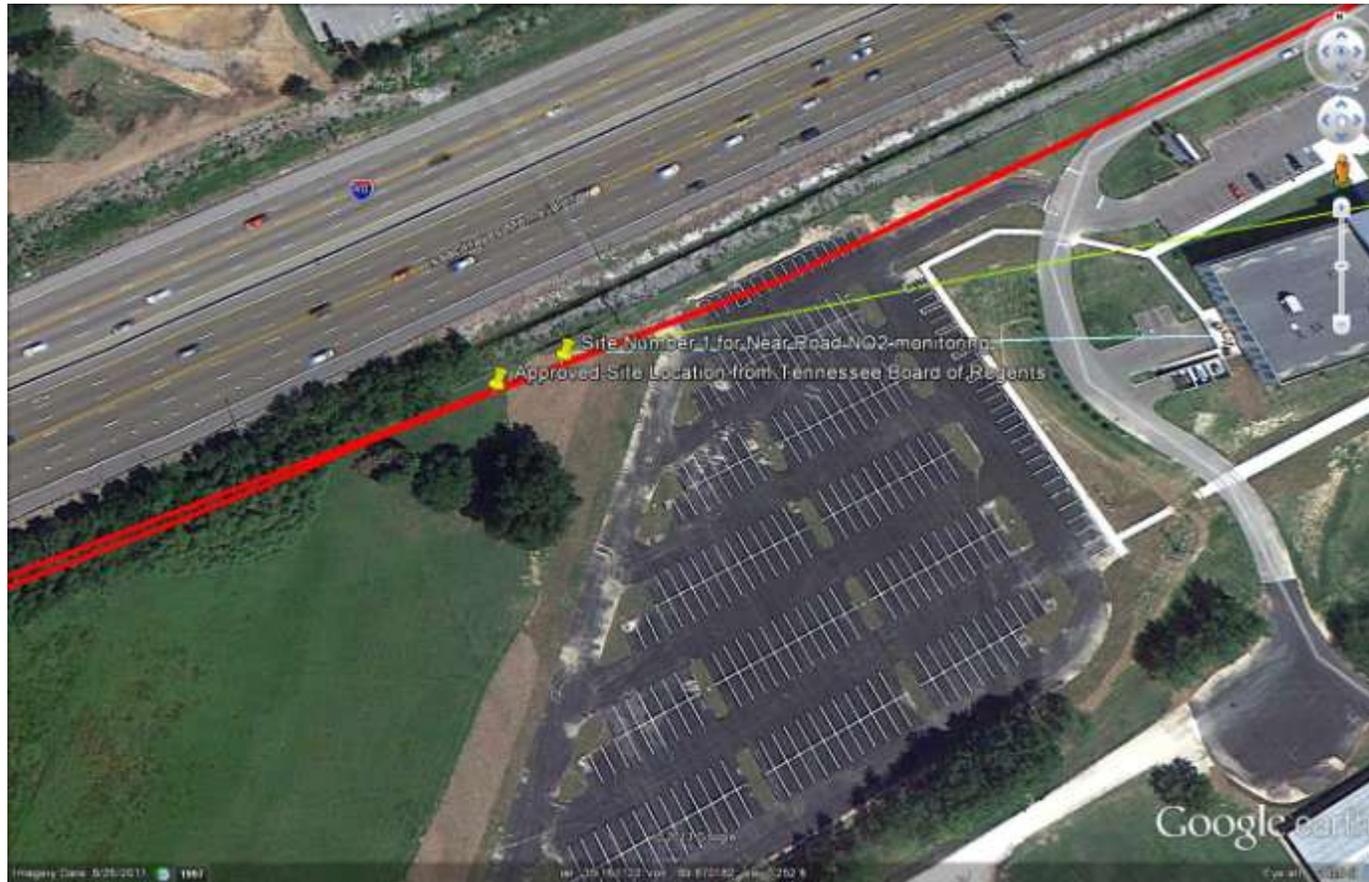
40 CFR Part 58 Appendix D provides design criteria for ambient air monitoring. The monitoring objective is to produce data on near-road locations where peak, ambient NO<sub>2</sub> concentrations are expected to occur as a result of on-road mobile source emissions. Monitoring at such a location within a particular urban area will provide data that can be compared to the NAAQS and used to assess exposures for those who live, work, play, go to school or commute within the near-roadway environment.

The spatial scale defines the physical dimensions of the air parcel nearest to a monitoring site throughout which actual pollutant concentrations are reasonably similar. It is determined by the characteristics of the area surrounding the air monitoring site and the site's distance from nearby air pollution sources such as roadways, factories, etc. In the case of the near road monitoring, the spatial scales to be used are neighborhood and urban. The nitrogen dioxide monitor would be representative of neighborhood and urban scale. The carbon monoxide monitor would be representative of neighborhood scale. The future PM fine monitor would be representative of urban scale.

## Proposed Site

The proposed site is located along the south side of Interstate 40 between the I-40/I-240 Interchange and Sycamore View Road. Access to the site is by going southeast on Sycamore View Road and southwest on Macon Cove. See Figure 1. The road segment is ranked 2<sup>nd</sup> in the FE-AADT accounting for 83% of the maximum FE-AADT. The property belongs to the State of Tennessee. The proposed site is situated along the northwest corner of Southwest Tennessee Community College's campus. The site location is approximately 20 feet to the west of the original site location selected by the EPA.

**Figure 1: Proposed Site Location for Near Road NO<sub>2</sub> Monitoring**

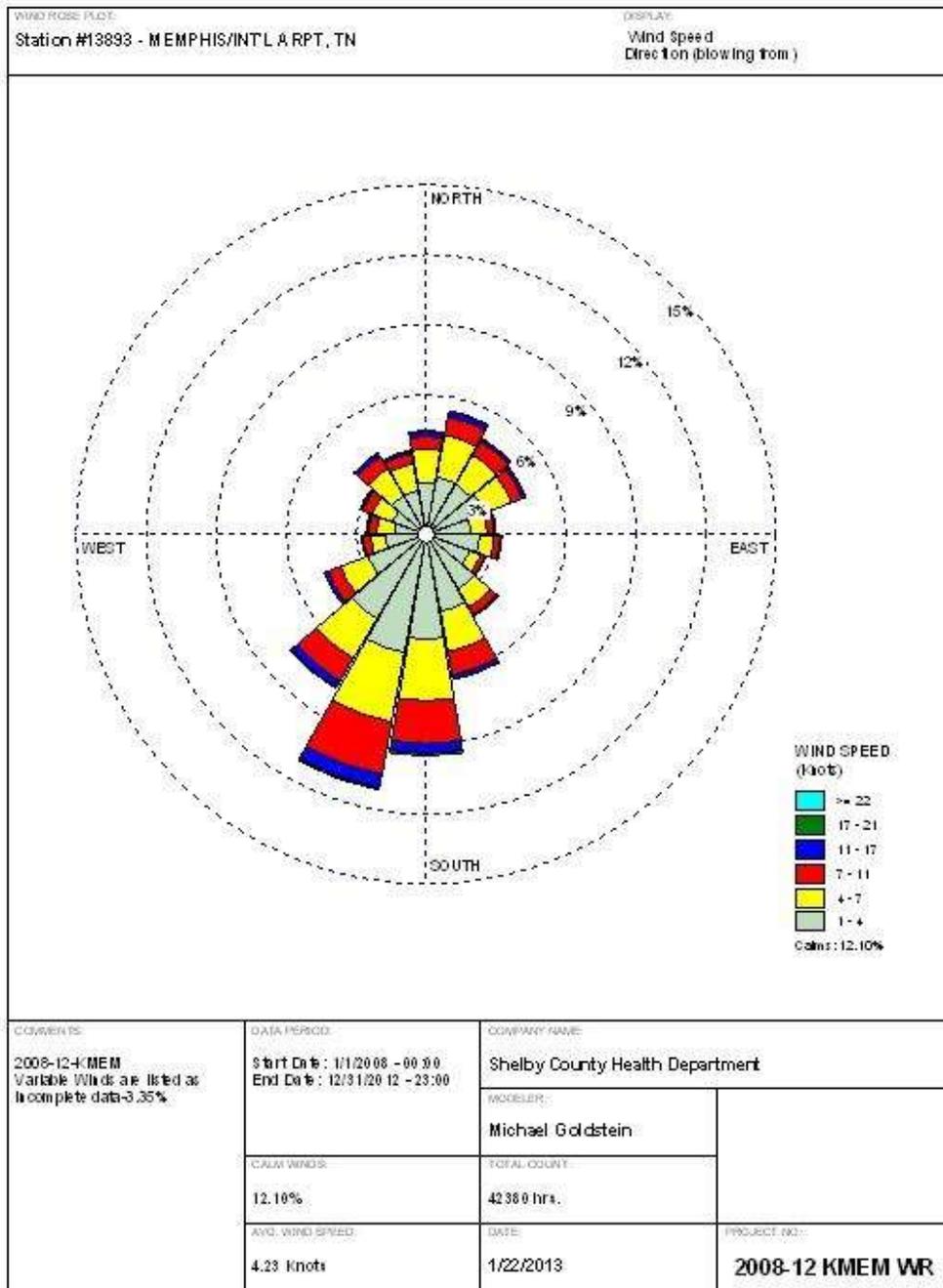


**Roadway design or configuration** – The potential site will be just below grade with the interstate. The monitoring site will be approximately 27 meters from the nearest outer lane of the interstate.

**Roadside Structures** – There are no sound walls or obstructive buildings by the potential site. A guard rail, gravel drainage ditch and fence separate the interstate from the potential site. Any vegetation obstructing the existing fencing will be removed prior to the monitoring station being established.

**Terrain** – The terrain begins to slope just west of the approved site by EPA.

**Meteorology** – See Figure 2 for a wind rose for the Memphis, TN, MS, and AR MSA  
Relative south, southwesterly wind directions



**Figure 2: Wind Rose for Memphis, TN-MS-AR MSA**

**Horizontal Spacing** – The inlet probe will be located approximately 27 meters from the nearest edge of the outer traffic lane of the target road segment.

**Vertical Spacing** – The inlet probe will be located on top of the monitoring shelter approximately 4 to 5 meters above the ground level.

**Existing Safety Features** – There is a guard rail that separates the interstate from a gravel drainage ditch and a fence that will separate this area from the monitoring station. Since the monitoring station will be located on the northwest corner of the parking lot at Southwest Tennessee Community, campus security patrols the area frequently.

**Existing Infrastructure** – Power is available within 30 meters of the potential site. The potential site will be situated along the northwest corner of an existing parking lot for Southwest Tennessee Community College's campus. The site location would be fairly safe because the campus security frequently patrols the parking lot and campus.

**Property Availability** – The property is owned by the State of Tennessee. The Tennessee Board of Regents and Southwest Tennessee Community College have agreed to allow us to use an area just west of the approved area by EPA. A lease agreement will be worked out with the college and the State of Tennessee to use the site location. Officials from the EPA Region 4 office have reviewed the site area and approved an area just east of the selected site by the Tennessee Board of Regents. Because of a future parking lot expansion, the State of Tennessee requested that our agency not place a structure along the approved area by EPA.

**Road Construction** – There may be future construction along the Interstate 40 / Interstate 240 interchange which is approximately 1 mile west of the proposed location. An excerpt from the November 10<sup>th</sup>, 2012 Memphis' edition of The Commercial Appeal states "*The renovation entails the construction of a 70-foot-high flyover ramp connecting the north I-40 loop with the eastbound interstate heading toward Nashville and completing the ramp from westbound I-40 to the north loop.*" The plans for the construction should be completed by next year with approximately 3 three years to completion for the entire project.

## Site Pictures

***Facing North*** – Picture facing Interstate 40. The vegetation and trees along the fence line will be cleaned and removed on the State of Tennessee property and on Department of Transportation Property.



***Facing Northeast*** – The approved area by the Tennessee Board of Regents is slightly sloped from the interstate. The area will be leveled.



**Facing East** – A power pole is available in the vicinity of the shelter location.



**Facing Southeast** – continued view of Southwest Tennessee's Community College parking lot in the distant



***Facing South*** – A large oak tree will be pruned and the lower limbs will be lifted up to move the drip line further from the monitoring station. The distance of the tree will be 20 meters away from the monitoring shelter.



***Facing Southwest*** – The area pictured here begins to slope and becomes swampy during heavy rain events. It is also on the edge of the 500 year FEMA flood plain.



***Facing West*** – Trees and vegetation will be cleared. The toppled tree will be removed. Just on the other side of the toppled tree begins the 500 year FEMA flood plain



***Facing Northwest*** – The terrain begins to slope and becomes below grade of the interstate.



# List of Attachments in Appendix

## Local Programs Submittals of Ambient Monitoring Plans

### 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.

#### List of Appendicies

Memphis Air Monitoring Plan.....	A
Ambient Monitor and Auxillary Support Equipment Evaluation.....	B
Memorandum of Agreement for Memphis, TN-MS-AR.....	C
Shelby County Air Pollution Monitoring Sites 2013.....	D
Letter to EPA requesting discontinuation of Fite Rd Station.....	E
EPA approval letter to discontinue Fite Rd.Station.....	F
Letter to EPA requesting discontinuation of STN at Alabama Station.....	G
Letter to EPA requesting discontinuation of PM 2.5 TEOM at Alabama Station.....	H
EPA approval letter to discontinue PM 2.5 TEOM at Alabama Station.....	I

## Appendix A Memphis Air Monitoring Plan

### Shelby County Health Department Air Pollution Control Program

#### Network Review

2013

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. 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:

- The SCHD is in the Second Phase of the Core Based Statistical Area Near Road NO<sub>2</sub> Monitoring. The station will include equipment for multi-pollutant monitoring also. Other types of non-regulatory monitors will be considered based on the availability of purchases money and staff resources to meet EPA's objective of multi pollutant monitoring in the near-road environment. Monitors to be considered include monitoring for traffic counts, ultra fine particles, and black carbon. A grant application and work plan were submitted to the EPA on March 28, 2012. The SCHD anticipates being funded for the one required site later this year. A site location on the campus of Southwest Tennessee Community College has been selected and awaiting approval from the EPA.
- The SCHD Air Monitoring Branch submitted a letter to the EPA on November 15, 2012 requesting permission to discontinue the SO<sub>2</sub> monitor at Fite (47-157-0046) and to relocate the PM 10 monitor from Fite Rd. to the Alabama Station (47-157-0024). An official letter from the EPA was received on January 10, 2013. On January 4, 2013, the SCHD Air Monitoring Branch began monitoring for PM 10 at the Alabama Station. The letters requesting the discontinuation and the approval are located on pages 37 and 39 in the Appendix.
- The EPA has requested the SCHD Air Monitoring Branch discontinue the PM 2.5 Speciation Trends Network (STN) at the Alabama Station due to funding. Also, another STN is located at the Shelby Farms NCORE site sampling on a 1 in 3 day schedule. The letter requesting the discontinuance of the monitor is located on page 40 in the Appendix.

- The PM 2.5 continuous monitor (TEOM) is temporarily discontinued at the Alabama (47-157-0024) site. The EPA was notified on September 19, 2011 of the status on the monitor and has given the SCHD approval to temporarily discontinue this sampling until funds are located to replace the monitor. This monitor began to malfunction on July 25, 2011. This information has been notated in AQS. The letters requesting the discontinuation and approval from the EPA are on pages 41 and 42 in the Appendix.

### Active Sites

Shelby County Health Department Active Sites	Pollutant	Monitor	AQS ID
416 Alabama	CO Continuous PM 10 (6 day)	Teledyne API Sierra Andersen	47-157-0024
6855 Mudville (Edmund Orgill Park)	O <sub>3</sub> Continuous	Teledyne API	47-157-1004
1330 Frayser	O <sub>3</sub> Continuous	Teledyne API	47-157-0021
1060 Tupelo	PM 10 Collocated (6 day)	Sierra Andersen 321-B	47-157-0016
1064 Breedlove	PM 2.5 Collocated (Daily and 6 day)	R&P 2025 Seq.	47-157-0047
6388 Haley Rd.	Pb (6 day) CO (Trace) Continuous SO <sub>2</sub> (Trace) Continuous NOY Continuous O <sub>3</sub> Continuous PM 10 (lo vol) (3 day), PM 10-2.5 (3 day) PM 2.5 (3 day) PM 2.5 Continuous PM 2.5 Speciation (3 day) Carbon (3 day) Wind Speed Wind Direction Ambient Temperature Relative Humidity Barometric Pressure	Sierra Andersen 350 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

### Appendix B 2013 Ambient Monitor and Auxillary Support Equipment Evaluation

<u>Site</u>	<u>Location</u>	<u>AIRS ID</u>	<u>Make</u>	<u>Model Number</u>	<u>Serial Number</u>	<u>Condi tion</u>
<b>Alabama</b>	416 Alabama	47-157-0024	URG	3000N	3000N; Controller 3N-B0742	Good
			URG	3000N	3000N; Module C 3N-B0847	Good
			URG	3000N	3000N; Stand (Pump) 3N-B0630	Good
			Met One	SASS	SASS; Control Box B1480	Good
			Met One	SASS	SASS; Sampling Head A7034	Good
			Met One	SASS	SASS; Pump Box B2919	Good
			API	300E	700	Good
			ESC	8816	4047	Good
<b>Edmund Orgill</b>	6855 Mudville Rd	47-157-1004	API	400	733	Good
			API	400A	650	Good
			API	401	188	Good
			Measurement Technologies	1001	921261	Good
			ESC	8832	A1570	Good
			Yokagawa	4182	220	Poor
			Kipp & Zonen	BD300	51518	Good
<b>Frayser</b>	1330 Frayser	47-157-0021	API	400A	459	Good
			API	401	253-S	Good
			API	401	188	Good
			Measurement Technoloioies	1001	941783	Good

			ESC	8832	A1568	Good
			Yokagawa	4182	222	Good
			API	T400	631	Good
			API	T703	169	Good
			API	701	1084	Good
<b>Gas Service Center</b>	1060 Tupelo	47-157-0016	Sierra Andersen		SN 1513	Good
			Sierra Andersen		SN 1653	Good
<b>Guthrie Clinic</b>	1064 Breedlove	47-157-0047	Rupprecht & Pataschnick	2025	2025A209189811	Good
			Rupprecht & Pataschnick	2025	2025A209219811	Good
			Andersen PM 2.5	RAAS 2.5-401		Poor
<b>Shelby Farms (NCORE)</b>	6388 Haley Rd.	47-157-0075	API	400E	2664	Good
			API	703E	297	Good
			API	701H	80	Good
			API	401	227	Good
			ESC	8832	A1578	Good
			Rupprecht & Pataschnick	2025	2025B218020506	Good
			Rupprecht & Pataschnick	2025	2025A209179811	Good
			Met One	Super SASS	Super SASS; Control Box K16485	Good
			Met One	Super SASS	Super SASS; Pump Box K17956	Good
			Met One	Super SASS	Super SASS; Sampling Head K17985	Good

			URG	3000N	3000N; Controller 3N-B0690	Good
			URG	3000N	3000N; Module C 3N-B0794	Good
			URG	3000N	3000N; Stand (Pump) 3N-B0592	Good
			API	100EU	135	Good
			API	300EU	1246	Good
			API	200EU	184	Good
			API	700EU	88	Good
			API	701H	113	Good
			Rupprecht & Pataschnick	1400a	140AB231030006	Good
			Climatronics	Met Gear	T-135	Good
			Kipp & Zonen	BD300	51519	Good
			Sierra Andersen		0240962025U	
<b>Health Department Warehouse</b>	994 Bellevue		API	100A	1450	Poor
			API	300	609	Poor
			API	200A	415	Poor
			Rupprecht & Pataschnick	2000FRM	20122	Good
			API	701	644	Good
			API	300	123	Poor
			API	201E	57	Good
			API	701	994	Good
			API	702	317	Good
			Dasibi	1008PC	5549	Poor
			API	501NH	438	Good

<b>Health Department Lab</b>	814 Jefferson Ave.		API	400	299	Poor
			Rupprecht & Pataschnick	2025	2025A209149811	Poor
			API	401	214	Poor
			ESC	8832	A1567	Good
			ESC	8832	A1571	Good
			API	100A	1765	Poor
			API	700	404	Good
			API	100E	236	Good
			Measurement Technologies	1001	7930553	Good
			ESC	8816	1264	Poor
			ESC	8816	1265	Poor
			ESC	8832	A1569	Good
			ESC	8816	1268	Poor
			ESC	8816	1266	Poor
			ESC	8816	1263	Poor
			ESC	8832	A1567	Good
			ESC	8816	3458	Poor

## Appendix C Memorandum of Agreement for Memphis, TN-MS-AR



Mark H. Luttrell, Jr.  
Mayor  
Shelby County

# SHELBY COUNTY HEALTH DEPARTMENT

YVONNE S. MADLOCK  
DIRECTOR

HELEN MORROW, M.D.  
HEALTH OFFICER



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

March 20, 2013

Mr. Robert Brawner, Acting Chief Environmental Manager  
Tennessee Division of Air Pollution Control  
9<sup>th</sup> Floor, L & C Annex  
Nashville, TN 37243-1531

Ms. Maya Rao, Chief of the Air Division  
Mississippi Department of Environmental Quality  
Office of Pollution Control, Air Division  
P.O. Box 2261  
Jackson, MS 39225

Mr. Mike Bates, Chief of the Air Division  
Arkansas Department of Environmental Quality  
5301 Northshore Dr.  
North Little Rock, AR 72118

Dear All,

Attached is a revision to the Air Monitoring Memorandum of Agreement (MOA) between our respective agencies. This revision document serves as the notification of changes described in the MOA between the Shelby County Health Department (SCHD), Mississippi Department of Environmental Quality (MDEQ), and the Arkansas Department of Environmental Quality (ADEQ) signed May and June of 2008. Of primary interest is the discontinuation of the SO<sub>2</sub> monitor and relocation of the PM 10 monitor at Fite Rd (47-157-0046). Also, EPA has requested that the PM 2.5 Speciation Trends Network monitor at the Alabama Station (47-157-0024) be discontinued.

### NCORE

Shelby County was chosen by EPA as one of 75 NCORE site locations, nationally. This multi-pollutant air monitoring station is located at 6388 Haley Road (47-157-0075) in the Shelby Farms area.

### NO<sub>2</sub>

The Shelby County Health Department (SCHD) once operated a NO<sub>2</sub> analyzer at 416 Alabama (47-157-0024). It began to malfunction on October 23, 2006. The site operator, along with a service advisor with Teledyne Instruments Advanced Pollution Instrumentation concluded that diagnosis of the problem would have to be made at the factory. The Teledyne-API technician determined that the NO<sub>2</sub> analyzer needed considerable repair. Taking into account the age of the instrument and the cost of repair, it was deemed to be not worthy of repair. Also, the SCHD did not have the resources to replace the analyzer. As a consequence, NO<sub>2</sub> has not been monitored in Shelby County since 2006. This information has been notated in AQS.

Shelby County anticipates in participating in the Second Phase of the Core Based Statistical Area Near Road NO<sub>2</sub> monitoring in conjunction with the recently promulgated NO<sub>2</sub> regulations.

## SO<sub>2</sub>

The SCHD requested permission from the EPA on November 15, 2012 to discontinue the SO<sub>2</sub> monitor at Fite Rd (47-157-0046). The monitor began operating on May 1, 1994 and its primary objective was to monitor emissions impact from local sources in the area. The primary source in the area has reduced their emissions by greater than 90 percent since 2005. On January 10, 2013, the SCHD received approval from EPA to discontinue SO<sub>2</sub> monitoring at the Fite Rd. station. The letters requesting the discontinuation and approval are attached on pages 37 and 39 of the Appendix.

## PM 2.5

The PM 2.5 continuous monitor (TEOM) is temporarily discontinued at the Alabama (47-157-0024) site. The EPA was notified on September 19, 2011 of the status on the monitor and has given the SCHD approval to temporarily discontinue this sampling until funds are located to replace the monitor. This monitor began to malfunction on July 25, 2011. This information has been noted in AQS. The letters requesting the discontinuation and approval are on pages 41 and 42 of the Appendix.

The EPA requested that the PM 2.5 Speciation Trends Network be discontinued on January 28, 2013. Funding from the EPA was discontinued. Also, EPA recognized that another Speciation Trends Network is operating at the Shelby Farms NCORE site on a 1 in 3 day schedule. This collocated sampler at the Alabama Station would not be needed. A letter of request was submitted to EPA on February 4<sup>th</sup>, 2013. It is located on page 40 of the Appendix.

## PM 10

The PM 10 monitor located at Fite Rd. (47-157-0046) has been given approval by EPA to be relocated to the Alabama Station (47-157-0024). The letter requesting the relocation and approval of the monitor is located on pages 37 and 39 of the Appendix.

## OZONE

The ozone monitoring requirement for NCORE increases the number of ozone analyzers in Shelby County to three at the following sites: 47-157-0021, 47-157-0075 and 47-157-1004.

## LEAD

The current lead (Pb) NAAQS requires identifying sources of lead emissions of one half ton per year or greater. The emissions inventory indicates that there are no sources with emissions of one half ton or greater. Therefore, the SCHD does not anticipate having to do any lead source sampling. However, lead monitoring is a component of the NCORE site. Lead sampling began on January 4, 2012.

If you have any questions, please call me at (901) 222-9576.

Sincerely,



Bob Rogers, Technical Manager  
Pollution Control

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**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:

<b>County</b>	<b>Federal Referenced Method PM 2.5</b>	<b>Continuous PM 2.5</b>	<b>Speciation PM 2.5</b>	<b>Co located PM 2.5</b>
Shelby County, TN SCHD	2	1	1	1
Crittenden County, AR ADEQ	1	1		
DeSoto County, MS MDEQ	1	1		1

Criteria Air Pollutant MSA monitoring network include:

<b>County</b>	<b>PM 10</b>	<b>O<sub>3</sub></b>	<b>NO<sub>x</sub>/NO/NO<sub>2</sub></b>	<b>CO</b>	<b>SO<sub>2</sub></b>
Shelby County, TN SCHD	2	3	0	2 (includes 1 trace at NCORE)	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.

## Appendix D Shelby County Air Pollution Monitoring Sites 2013

**Shelby County Air Pollution Monitoring Sites 2013**

<u>Site</u>	<u>Address</u>	<u>State</u>	<u>County</u>	<u>Site</u>	<u>Pollutant</u>	<u>Parameter</u>	<u>POC</u>
Alabama	416 Alabama	47	157	0024	CO	42101	1
					PM 10	81102	1
Edmund Orgill	6855 Mudville Rd.	47	157	1004	O <sub>3</sub>	44201	1
Frayser	1330 Frayser Blvd.	47	157	0021	O <sub>3</sub>	44201	1
Gas Service Center	1060 Tupelo	47	157	0016	PM 10	81102	1
					PM 10	81102	2
Guthrie Clinic	1064 Breedlove	47	157	0047	PM 2.5	88101	1
					PM 2.5	88101	2
Shelby Farms (NCORE)	6388 Haley Rd.	47	157	0075	Pb	14129	1
					CO (Trace)	42101	1
					SO <sub>2</sub> (Trace)	42401	1
					NOY	42600	1
					O <sub>3</sub>	44201	1
					PM 10 (Lo Vol)	85101	1
					PM 10-2.5	86101	1
					PM 2.5	88101	1
					PM 2.5	88502	3
					PM 2.5	88502	6
					Wind Speed	61101	1
					Wind Direction	61102	1
					Ambient Temperature	62101	1
					Relative Humidity	62201	1
					Barometric Pressure	64101	1

## Appendix E Letter to EPA requesting discontinuation of Fite Rd Station

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Mark H. Luttrell, Jr.  
Mayor  
Shelby County

# SHELBY COUNTY HEALTH DEPARTMENT

YVONNE S. MADLOCK  
DIRECTOR

HELEN MORROW, M.D.  
HEALTH OFFICER



**Public Health**  
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November 15<sup>th</sup>, 2012

Ryan Brown  
Environmental Engineer  
U.S. Environmental Protection Agency, Region 4  
Air, Pesticides & Toxics Management Division  
61 Forsyth Street, SW  
Atlanta, GA 30303

Dear Mr. Brown,

The Shelby County Health Department (SCHD) is requesting approval to discontinue the sulfur dioxide (SO<sub>2</sub>) monitor at the Fite Road (47-157-0046) Air Monitoring Station effective January 1, 2013. The monitor began operating on May 1, 1994 and its primary objective was maximum precursor emissions impact from the local sources in the area. The three (3) Year Design Value for 2010 was 11 parts per billion. The highest concentration for SO<sub>2</sub> for a 1 hour period in 2010 was 15 parts per billion and the average concentration was 3.74 parts per billion. The primary source in the area has reduced their emissions by greater than 90 percent since 2005. Therefore, with industry reducing their emissions and with the data reflecting a significant drop in the amount of SO<sub>2</sub> measured, the Shelby County Health Department is requesting that the Fite Road SO<sub>2</sub> monitor be discontinued.

On June 21, 2011, the Shelby County Health Department began operating a Trace Level SO<sub>2</sub> monitor at the Shelby Farms (47-157-0075) NCORE Air Monitoring Station. The monitoring objective of the NCORE site was to produce data that represents a fairly large area in a neighborhood or urban scale. Trace Level SO<sub>2</sub> Monitoring east of the urban core will provide the best location for measuring transport and secondary pollutant formation from that area. With the placement of the Trace Level SO<sub>2</sub> monitor downwind of the more industrialized areas, this compliments the existing network. Therefore, the Shelby County Health Department is requesting permission to use the Trace Level SO<sub>2</sub> monitor at the Shelby Farms NCORE to meet the minimum monitoring requirements in the Memphis CBSA.

In addition, the Shelby County Health Department is requesting permission to discontinue the PM 10 monitor at Fite Rd. (47-157-0046) effective January 1, 2013 and relocate the PM 10 monitor to the Air Monitoring Station located at 416 Alabama St. (47-157-0024) beginning January 1, 2013. This monitor began operating on May 1, 1994 at the Fite Rd. location. By relocating this PM 10 monitor to another Air

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---

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(901) 222-9000

---

Monitoring Station, this will help to reduce costs. Also, during May 2010 Memphis sustained substantial flooding and one of the affected areas was where the Fite Road Air Monitoring Station was located.

These items were requested in Shelby County's Annual Ambient Air Monitoring Network Plan submitted by the State to EPA in June 2012. The Environmental Protection has given permission to discontinue the SO<sub>2</sub> monitoring at Fite Road and relocate the PM 10 monitoring from Fite Road in this review. This letter serves as a formal request from the Shelby County Health Department to receive permission from EPA to fulfill these objectives.

If you have any questions or comments, or if you require additional information, please contact me at (901) 222-9581.

Sincerely,



Judy Low, Acting Supervisor  
Pollution Control / Air Monitoring Branch  
Shelby County Health Department

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---

814 Jefferson Avenue † Memphis, Tennessee 38105  
(901) 222-9000

## Appendix F EPA approval letter to discontinue Fite Rd.Station



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

JAN 10 2013

Ms. Judy Low  
Acting Supervisor  
Pollution Control Air Monitoring Branch  
Shelby County Health Department  
814 Jefferson Avenue  
Memphis, Tennessee 38105

Dear Ms. Low:

This is in response to your letter dated November 15, 2012, requesting that the U.S. Environmental Protection Agency Region 4 approve the discontinuation of sulfur dioxide (SO<sub>2</sub>) and coarse particulate matter (PM<sub>10</sub>) monitoring at Shelby County Health Department's Fite Road site (AQS ID 47-157-0046). SCHD requested to shut down its SO<sub>2</sub> monitor and move its PM<sub>10</sub> monitor to SCHD's monitoring site at 416 Alabama Avenue (AQS ID 47-157-0024).

The EPA already approved the shutdown of the Fite Road SO<sub>2</sub> monitor and conditionally approved the shutdown and relocation of the Fite Road PM<sub>10</sub> monitor in its September 21, 2012, response letter to Tennessee's 2012 annual ambient air monitoring network plan. The agency took these actions because it determined that the monitors meet the discontinuation requirements of 40 CFR § 58.14(c)(1) by being in attainment of the respective national ambient air quality standards (NAAQS) during the previous five years and by having a less than 10 percent chance of exceeding 80 percent of the NAAQSs during the next three years. The agency also determined that after the Fite Road site is shutdown that the Memphis Core Based Statistical Area would still meet the minimum monitoring requirements for SO<sub>2</sub> and PM<sub>10</sub> found in 40 CFR Part 58, Section 4.4 and Table D-4. The agency approved the discontinuation and relocation of PM<sub>10</sub> monitoring on the condition that the PM<sub>10</sub> monitor would not be shutdown until SCHD formally identified a suitable alternative location. With SCHD's identification of the Alabama Avenue site as the new location for the PM<sub>10</sub> monitor (per its November 15, 2012, letter), the EPA fully approves the PM<sub>10</sub> monitor shutdown at the Fite Road site and relocation to the Alabama Avenue site.

Should you have any questions, please feel free to contact Ryan Brown of my staff at (404) 562-9147 or Brown.Ryan@epa.gov.

Sincerely,

A handwritten signature in black ink that reads "Carol G. Kember for 1/4/13".

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

cc: Mr. Robert Brawner, TDEC

Internet Address (URL) • <http://www.epa.gov>

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## Appendix G Letter to EPA requesting discontinuation of STN at Alabama Station



Mark H. Luttrell, Jr.  
Mayor  
Shelby County

# SHELBY COUNTY HEALTH DEPARTMENT

YVONNE S. MADLOCK  
DIRECTOR

HELEN MORROW, M.D.  
HEALTH OFFICER



**Public Health**  
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February 4<sup>th</sup>, 2013

Mr. Todd Rinck  
Monitoring and Technical Support Section Chief  
U.S. Environmental Protection Agency, Region 4  
61 Forsyth Street, S.W.  
Atlanta, GA 30303

Dear Mr. Rinck,

The Shelby County Health Department (SCHD) is requesting approval to discontinue the Speciation Trends Network at the Alabama Avenue (47-157-0024) Air Monitoring Station effective January 28, 2013. The monitor began operating on May 14, 2006 as one of the Speciation Trends Network sites. It was relocated from its original location at Guthrie Clinic (47-157-0047) to the Alabama Station to be a part of the NCORE monitoring network but approval was not granted by EPA in the summer of 2006 for this site to be a NCORE location. Since the Speciation Trends Network could only be moved once from the original location, the monitors could not be moved again to the new NCORE site.

On February 8<sup>th</sup>, 2011, the Shelby County Health Department began operating a Chemical Speciation Network of monitors at the Shelby Farms (47-157-0075) NCORE Air Monitoring Station.

On December 18<sup>th</sup>, 2012 at the request of Daniel Garver with Region 4 EPA and Dave Shelow with OAQPS, we had a conference call to determine if Speciation monitoring should continue at the Alabama Station. It was discussed that since Speciation is being monitored at the Shelby Farms NCORE station, the Alabama station would not be needed. By discontinuing the Speciation Network at the Alabama Air Monitoring Station, this will help to reduce costs.

This letter serves as a formal request from the Shelby County Health Department to receive permission from EPA to fulfill these objectives.

If you have any questions or comments, or if you require additional information, please contact me at (901) 222-9581.

Sincerely,

A handwritten signature in cursive script that reads "Judy Low".

Judy Low, Acting Supervisor  
Pollution Control/Air Monitoring Branch  
Shelby County Health Department

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Appendix H Letter to EPA requesting discontinuation of PM 2.5 TEOM at Alabama Station



Mark H. Luttrell, Jr.  
Mayor  
Shelby County

## SHELBY COUNTY HEALTH DEPARTMENT

YVONNE S. MADLOCK  
DIRECTOR

HELEN MORROW, M.D.  
HEALTH OFFICER



**Public Health**  
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Stacy Harder  
Environmental Engineer  
Air, Pesticides & Toxics Management Division  
U.S. Environmental Protection Agency, Region 4  
61 Forsyth Street, S.W.  
Atlanta, GA 30303-8960

Dear Ms. Harder:

September 19, 2011

The Shelby County Health Department (SCHD) operates a continuous PM2.5 TEOM analyzer at 416 Alabama (47-157-0024). It began to malfunction on July 25, 2011. The analyzer would power up for a few seconds and then the CPU side of the instrument would shut down. The SCHD technician talked to a technician with Thermo Fisher Scientific, who stated that it could be any number of things wrong. The technician suggested that it should be shipped back to them in order to determine what the repair cost would be. The instrument was subsequently shut down.

This instrument was the first TEOM in Shelby County's air monitoring network, and was placed into operation on February 1, 1994. Over the years, this instrument has had numerous repairs. Staff technicians and the manufacturer performed these repairs. The SCHD currently does not have the resources to repair or replace the TEOM. And considering the age of this instrument, replacing it might be the most feasible avenue to take. Therefore, the SCHD is officially notifying EPA of the temporary status of the TEOM at 416 Alabama. As soon as funds are identified, action will be taken to rectify the situation.

Participating agencies of the Memphis, TN-MS-AR Metropolitan Statistical Area (MSA) have a signed Memorandum Of Agreement (MOA). This MOA formalizes and reaffirms 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). Currently, Crittenden County, Arkansas and DeSoto County, Mississippi have TEOMs in operation. In addition the SCHD has a TEOM at the NCore (47-157-0075) site.

If there are any questions or concerns, feel free to call me at (901) 222-9546.

Sincerely,

Edward C. Cain, Supervisor  
Air Pollution Control  
Air Monitoring Branch

**Mission**

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(901) 222-9000

# Appendix I EPA approval letter to discontinue PM 2.5 TEOM at Alabama Station



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

NOV 21 2011

NOV 29 2011

Mr. Edward C. Cain  
Air Pollution Control  
Air Monitoring Branch  
Shelby County Health Department  
814 Jefferson Avenue  
Memphis, Tennessee 38105

Dear Mr. Cain:

This is in response to your letter dated September 19, 2011, requesting that the U.S. Environmental Protection Agency review a request to temporarily discontinue ambient air monitoring submitted by the Memphis and Shelby County Health Department (MSCHD). Specifically, MSCHD is proposing to temporarily discontinue fine particulate monitoring (PM<sub>2.5</sub>) at the 416 Alabama (AQS ID 47-157-0024) state or local air monitoring station. Regulations for ambient air quality surveillance are found at 40 CFR Part 58.

EPA has reviewed this request and determined that the monitor is eligible for discontinuation under the minimum monitoring requirements for continuous PM<sub>2.5</sub>, found in section 4.7.2 and Table D-5 of 40 CFR Part 58 Appendix D. The Memphis core based statistical area will continue to meet the continuous PM<sub>2.5</sub> collocation monitoring requirements after this monitor is temporarily discontinued. It is our understanding that MSCHD plans to repair or replace the monitor as soon as funds allow. Therefore, EPA approves the temporary discontinuation of the monitor listed above.

Should you have any questions, please contact Doug Neeley at (404) 562-9097, or have your staff contact Stacy Harder at (404) 562-9042 or harder.stacy@epa.gov.

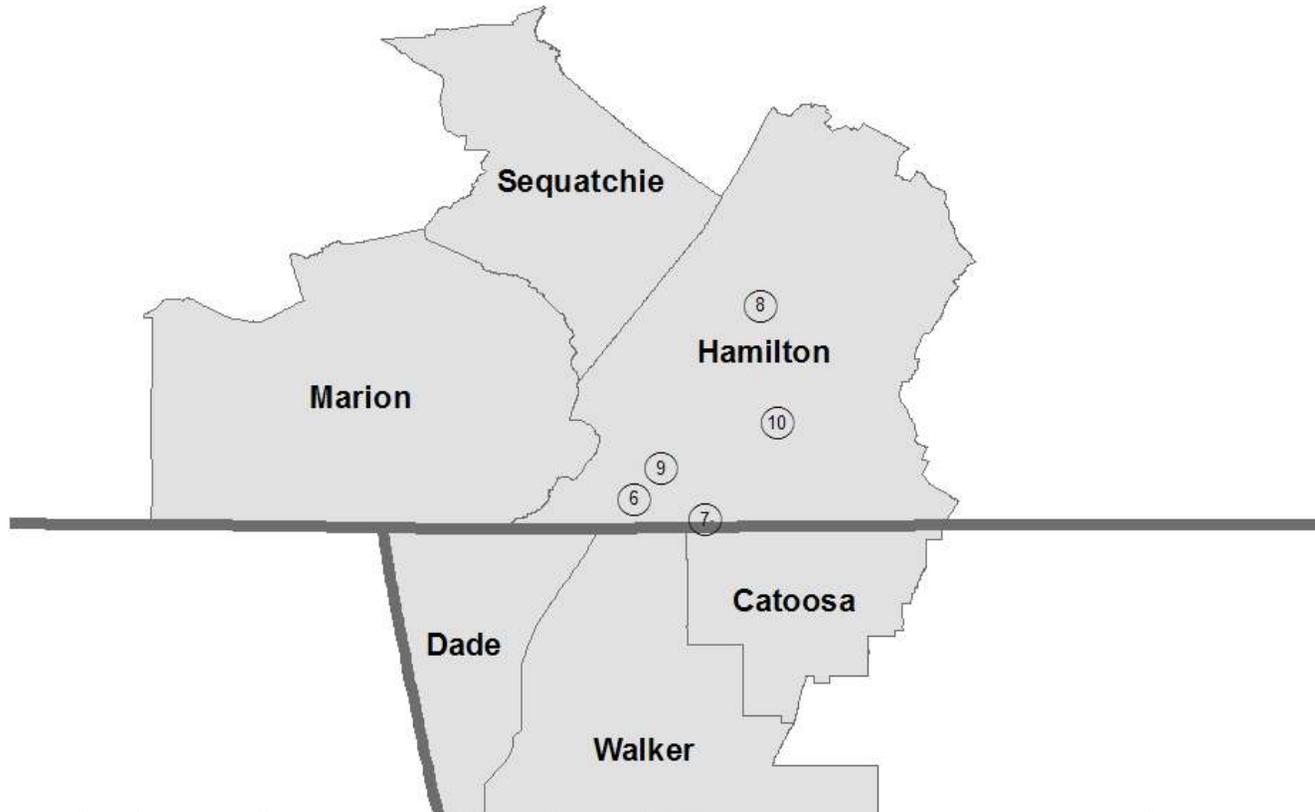
Sincerely,

  
Gwendolyn Keyes Fleming  
Regional Administrator

cc: Mr. Jackie Waynick  
TDEC, Chief of Environmental Technical Services

Archie Lee, EPA Region 4 SESD

## Chattanooga, TN-GA Area



Site	AQSID	ParaName	CBSAFP	Address
6	470650006	PM10, PM10	16860	3300 SOUTH BROAD STREET. 33RD AND BROAD,
7	470650031	PM2.5	16860	1517 TOMBRAS AVENUE, EAST RIDGE
8	470651011	O3, PM2.5	16860	SODDY DAISY H.S. 00618 SEQUOYAH RD
9	470654002	PM2.5, PM2.5, PM2.5 Cont, PM Spec	16860	RIVERSIDE SUBSTATION 911 SISKIN DR
10	470654003	O3	16860	6200 BONNY OAKS DRIVE EASTSIDE UTILITY F

**Tennessee'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 SO2		42602 NO2		44201 Ozone			81102 PM 10		88101 PM 2.5				88502 PM 2.5 Speciation		88101 or 88501 PM 2.5 Cont	
CBSA 2003 Code	Census 2000 / 2010	CBSA 2003 Title (MS Areas)	Operating	Required	Operating	Required	Operating	Required	Operating	Required	Operating	2010 2012 8 Hr DV	Required	Operating	Required	Operating	2010 2012 Annual DV ug/m <sup>3</sup>	2010 24 Hr DV ug/m <sup>3</sup>	Required	Operating	Required	Operating	Required
			16860	476531/533372	Chattanooga, TN-GA	0	0	0	0	0	0	0	0	2	0.076	2	2 <sup>1</sup>	1 - 2	4 <sup>1</sup>	11.2	24	1	1

<sup>1</sup> Includes collocated monitor.

The TEOM POC 3 PM2.5 particulate monitors and the speciation POC 5 STN monitors are generally not suited to be used for comparisons to the annual PM2.5 standards.

No lead or SO2 monitors are anticipated to be required to be established. The need for additional monitoring sites may be met by re-location of existing network sites. Additional monitoring sites will require additional resources for both equipment and operational expenses.

AQSID	County Name	Monitor Type	Para	Para Name	POC	Int	Year	Collection Frequency	Address	CBSA	Lat	Lon	Mtd	RepOrg	RepOrgName
470650006	Hamilton	SLAMS	81102	PM10	1	7	2012	6	3300 SOUTH BROAD STREET. 33RD AND BROAD,	16860	+35.017139	-85.322056	064	0170	Chattanooga-Hamilton County Air Pollution Control
470650006	Hamilton	SLAMS	81102	PM10	2	7	2012	6	3300 SOUTH BROAD STREET. 33RD AND BROAD,	16860	+35.017139	-85.322056	064	0170	Chattanooga-Hamilton County Air Pollution Control
470650031	Hamilton	SPECIAL PURPOSE	88101	PM2.5	1	7	2012	3	1517 TOMBRAS AVENUE, EAST RIDGE	16860	+34.994555	-85.242872	118	0170	Chattanooga-Hamilton County Air Pollution Control
470651011	Hamilton	UNKNOWN	44201	O3	1	1	2012	Hourly	SODDY DAISY H.S. 00618 SEQUOYAH RD	16860	+35.233527	-85.181806	000	0170	Chattanooga-Hamilton County Air Pollution Control
470651011	Hamilton	SPECIAL PURPOSE	88101	PM2.5	1	7	2012	6	SODDY DAISY H.S. 00618 SEQUOYAH RD	16860	+35.233527	-85.181806	118	0170	Chattanooga-Hamilton County Air Pollution Control
470654002	Hamilton	SLAMS	88101	PM2.5	1	7	2012	3	RIVERSIDE SUBSTATION 911 SISKIN DR	16860	+35.050928	-85.292975	118	0170	Chattanooga-Hamilton County Air Pollution Control
470654002	Hamilton	SLAMS	88101	PM2.5	2	7	2012	3	RIVERSIDE SUBSTATION 911 SISKIN DR	16860	+35.050928	-85.292975	118	0170	Chattanooga-Hamilton County Air Pollution Control
470654002	Hamilton	IMPROVE	88501	PM2.5 Cont	3	1	2012	Hourly	RIVERSIDE SUBSTATION 911 SISKIN DR	16860	+35.050928	-85.292975	715	0170	Chattanooga-Hamilton County Air Pollution Control
470654002	Hamilton	SUPLMNTL SPECIATION	88502	PM Spec Carbon	5	7	2012	6	RIVERSIDE SUBSTATION 911 SISKIN DR	16860	+35.050928	-85.292975	810	0170	Chattanooga-Hamilton County Air Pollution Control
470654003	Hamilton	SLAMS	44201	O3	1	1	2012	Hourly	6200 BONNY OAKS DRIVE EASTSIDE UTILITY F	16860	+35.102638	-85.162194	047	0170	Chattanooga-Hamilton County Air Pollution Control

AQSID	County Name	Monitor Type	Para	Para Name	Monitoring Instrument	Analysis	Ref Mtd ID	Monitor Objective Type	Dominant Source	Measurement Scale	Land Use Type	Location Setting	Date Site Established
470650006	Hamilton	SLAMS	81102	PM10	SIERRA-ANDERSEN/GMW 321-B	GRAVIMETRIC	RFPS-1287-064	UNKNOWN	AREA	URBAN SCALE	INDUSTRIAL	URBAN AND CENTER CITY	1/1/1965
470650006	Hamilton	SLAMS	81102	PM10	SIERRA-ANDERSEN/GMW 321-B	GRAVIMETRIC	RFPS-1287-064	UNKNOWN	AREA	URBAN SCALE	INDUSTRIAL	URBAN AND CENTER CITY	1/1/1965
470650031	Hamilton	SPECIAL PURPOSE	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	REGIONAL TRANSPORT	AREA	NEIGHBORHOOD	COMMERCIAL	URBAN AND CENTER CITY	5/6/1999
470651011	Hamilton	UNKNOWN	44201	O3	#N/A	#N/A	#N/A	HIGHEST CONCENTRATION	AREA	REGIONAL SCALE	AGRICULTURAL	RURAL	8/1/1978
470651011	Hamilton	SPECIAL PURPOSE	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	REGIONAL TRANSPORT	NULL	REGIONAL SCALE	AGRICULTURAL	RURAL	8/1/1978
470654002	Hamilton	SLAMS	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	NULL	URBAN SCALE	COMMERCIAL	URBAN AND CENTER CITY	1/1/1999
470654002	Hamilton	SLAMS	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	NULL	URBAN SCALE	COMMERCIAL	URBAN AND CENTER CITY	1/1/1999
470654002	Hamilton	IMPROVE	88501	PM2.5 Cont		TEOM Gravimetric 30 deg C		POPULATION EXPOSURE	AREA	URBAN SCALE	COMMERCIAL	URBAN AND CENTER CITY	1/1/1999
470654002	Hamilton	SUPLMNTL SPECIATION	88502	PM Spec Carbon	MetOne Super SASS URG 3000	Gravimetric		POPULATION EXPOSURE	NULL	NULL	COMMERCIAL	URBAN AND CENTER CITY	1/1/1999
470654003	Hamilton	SLAMS	44201	O3	THERMO ELECTRON 49	ULTRA VIOLET	EQOA-0880-047	POPULATION EXPOSURE	MOBILE	NEIGHBORHOOD	INDUSTRIAL	RURAL	3/1/2004

# Chattanooga-Hamilton County Air Pollution Control Bureau Network Review 2013

## Ozone Attainment

The Chattanooga Area (for ozone is comprised of Hamilton and Meigs Counties in Tennessee and Catoosa and Walker Counties in Georgia) was designated attainment in April 2012 for the .075 ppm ozone standard for the years 2009-2011.

## PM<sub>2.5</sub> Attainment

Chattanooga-Hamilton County's PM<sub>2.5</sub> data meets the recently promulgated 12 µg/m<sup>3</sup> PM<sub>2.5</sub> standard.

### Active Sites

Chattanooga-Hamilton County Active Sites	Pollutant	Monitor	AQS #
3300 South Broad Street/ WDEF	PM <sub>10</sub> Collocated (6-day)	Sierra Anderson 321B	470650006
911 Siskin Drive formerly University of Tennessee at Chattanooga (UTC)	PM <sub>2.5</sub> Collocated ( 3-day) PM <sub>2.5</sub> Speciation (6-day) Carbon (6-day) PM <sub>2.5</sub> Continuous TEOM	R & P 2025 Seq. Met 1 SuperSASS URG 3000 TEOM 1400A	470654002 CORE PM <sub>2.5</sub>
1517 Tombras Avenue/ formerly 1510 Maxwell Rd	PM <sub>2.5</sub> (Collocation from 1/1/2009-1/17/2010) 3-day monitoring began 1/20/2010)	R & P 2025 Seq.	470650031
618 Sequoyah Access Road at Soddy- Daisy High School	PM <sub>2.5</sub> (6-day) Ozone Continuous Ozone Calibrator	R & P 2025 Seq. TECO 49C TECO 49CPS	470651011
6200 Bonny Oaks Drive Eastside Utility District	Ozone Continuous Ozone Calibrator	TECO 49C TECO 49CPS	470654003

**Revisions to the Hamilton County portions of the AMP provided courtesy of the Chattanooga-Hamilton County Air Pollution Control Bureau**

## Site Changes for 2013

Hamilton County anticipates being funded for one required site in a late implementation phase (January 1, 2017) of the Core-Based Statistical Area near-road monitoring for NO<sub>2</sub>. This calendar year the Bureau will be seeking an appropriate near-road site and property owner permissions so that a plan can be implemented quickly once funding is in place.

The Bureau is searching for an appropriate site to move the 470654003 Eastside Utility ozone monitor within a one mile radius of the current location. Tightened security has made the site less accessible, and the utility is in the middle of a large expansion project.

Additionally, the Bureau will be looking at monitoring sites which can be eliminated in order to reduce costs.

### Monitoring Equipment Evaluation Chattanooga AMP

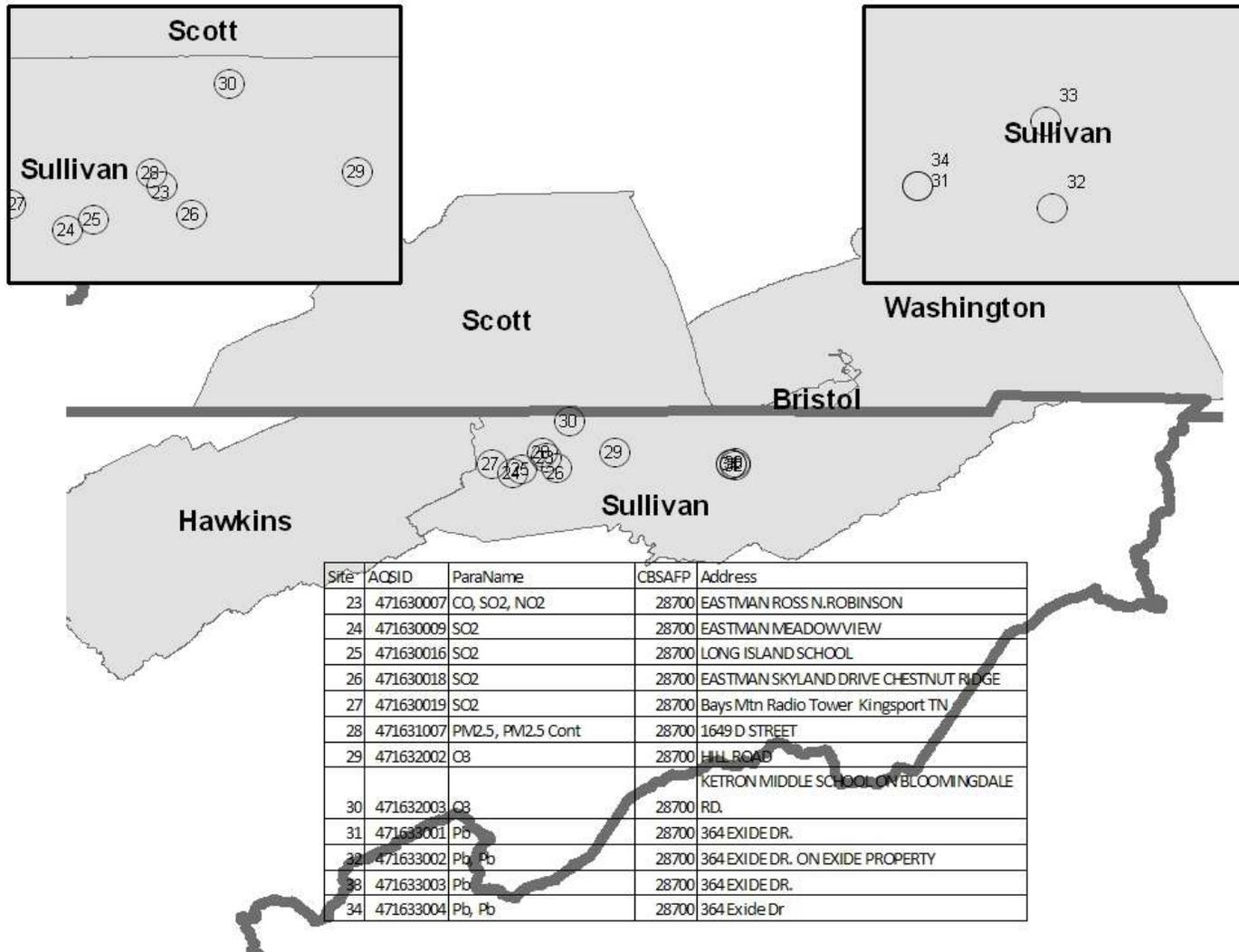
#### Equipment Condition

Equipment	Location	Serial Number	Condition
PM <sub>10</sub>	0006	1847	Good
PM <sub>10</sub>	0006	1845	Good
PM <sub>2.5</sub>	4002	20781	Good
PM <sub>2.5</sub>	4002	20775	Good
PM <sub>2.5</sub>	0031	20772	Good
PM <sub>2.5</sub>	Spare	20774	Good
PM <sub>2.5</sub>	1011	90709	Good
PM <sub>2.5</sub> TEOM	4002	1400A 24452 Eq Unit SES1B 203940211 Sensor Unit 140AB 244520302	Good
Met One Speciation	4002	a5924/a5910	Good
URG 3000	4002	3N-B0768	Good <sup>1</sup>
Ozone	1011	49C-58192-316	Good
Ozone	4003	49C-57404-313	Good
Ozone Calibrator	1011	49CPS-66337-352	Good
Ozone Calibrator	4003	49CPS-66338-352	Good
Datalogger	1011	ESC 8816	Good
Datalogger	4003	ESC 8816	Good
Datalogger	4002	ESC 8832 AO994	Good
Datalogger	Spare	ESC 8832 A 4010 K	Good
Audit Monitor	1011	0607415796	Good
Chart Recorder	1011	1001685	Good
Chart Recorder	4003	1001686	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	Good <sup>2</sup>

<sup>1</sup> Cartridges have leak issues for which we are working with URG and EPA Region 4

<sup>2</sup> Floor will be repaired or replaced due to water leak.

## Kingsport Bristol Johnson City Area



**Tennessee'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 SO2		42602 NO2		44201 Ozone			81102 PM 10		88101 PM 2.5				88502 PM 2.5 Speciation		88101 or 88501 PM 2.5 Cont	
CBSA Code	Census 2000 / . 2010	CBSA Title (MS Areas)	Operating	Required	Operating	Required	Operating	Required	Operating	Required	Operating	2010 2012 8 Hr DV	Required	Operating	Required	Operating	2010 2012 Annual DV ug/m	2010 2012 24 Hr DV ug/m	Required	Operating	Required	Operating	Required
27740	181607/198716	Johnson City, TN	0	0	0	0	0	0	0	0	0		0	0	0			0	0	0	0	0	0
Census Area Identification and Population Data			14129 Lead		42101 CO		42401 SO2		42602 NO2		44201 Ozone			81102 PM 10		88101 PM 2.5				88502 PM 2.5 Speciation		88101 or 88501 PM 2.5 Cont	
CBSA Code	Census 2000 / . 2010	CBSA Title (MS Areas)	Operating	Required	Operating	Required	Operating	Required	Operating	Required	Operating	2010 2012 8 Hr DV	Required	Operating	Required	Operating	2010 2012 Annual DV ug/m	2010 2012 24 Hr DV ug/m	Required	Operating	Required	Operating	Required
28700	298484/309544	Kingsport-Bristol-Bristol, TN-VA	6 <sup>1</sup>	1	1	0	1	1	1	0	2	0.074	1	0	0	1	10.4	20	1	0	0	1	1

<sup>1</sup>Includes a collocated state monitor and a collocated company monitor.

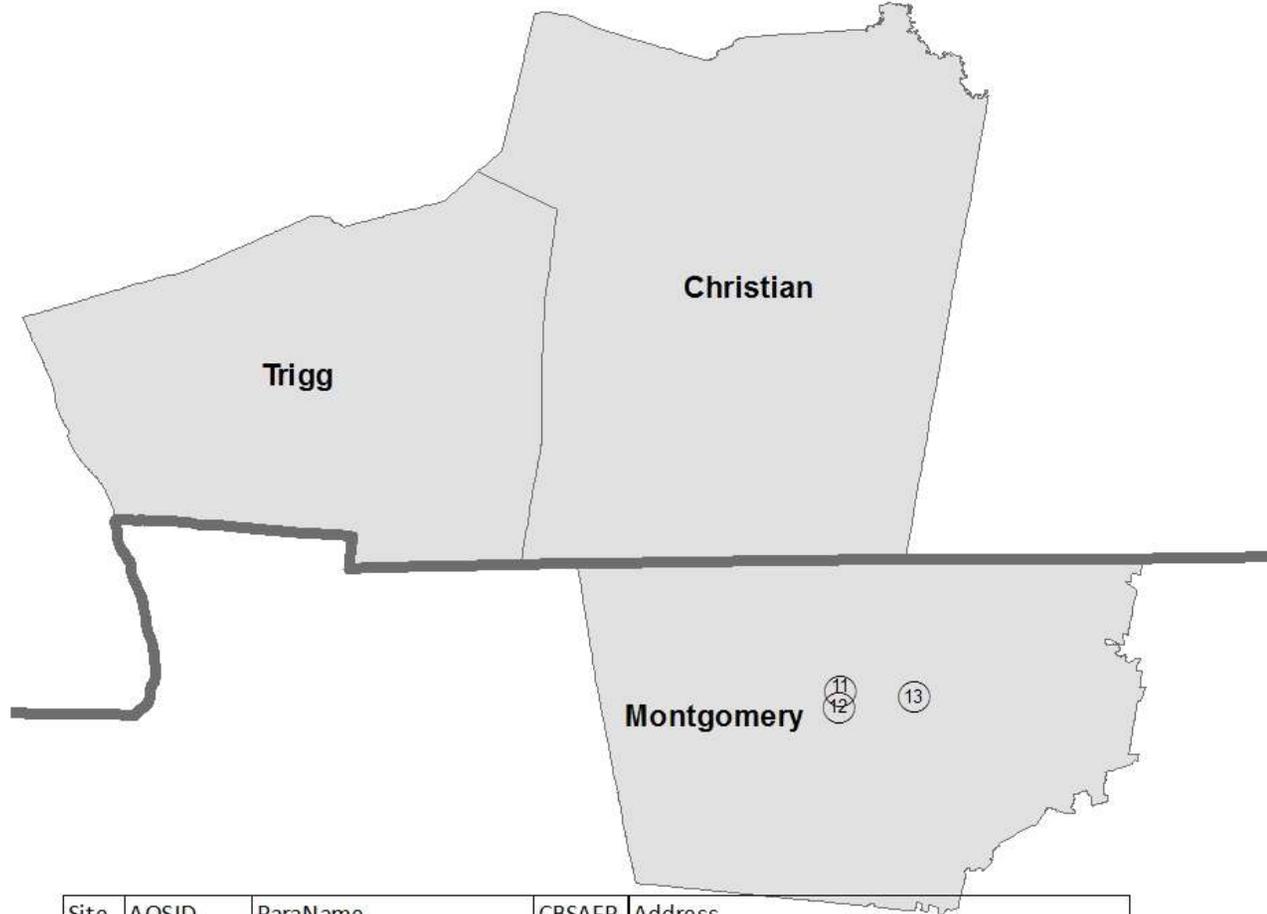
The TEOM POC 3 PM2.5 particulate monitors and the speciation POC 5 STN monitors are generally not suited to be used for comparisons to the annual PM2.5 standards.

There are no plans to relocate or shutdown any existing monitoring sites in the MSA area described. The special SO2 monitoring study conducted in and around the Eastman Chemical facility in Kingsport is a short-term study designed to help validate an SO2 model and the subsequent modeling protocol to be employed to determine SO2 attainment/non-attainment in the Kingsport area. The study sites are identified in the site location graphic provided. One of the sites will remain operational to meet the SO2 monitoring requirement in this MSA.

AQSID	County Name	Monitor Type	Para	Para Name	POC	Int	Year	Collection Frequency	Address	CBSA	Lat	Lon	Mtd	RepOrg	RepOrgName
471633001	Sullivan	INDUSTRIAL	14129	Pb	1	7	2012	3	364 EXIDE DR.	28700	+36.525556	-82.273333	107	0375	Exide Corporation
471633002	Sullivan	INDUSTRIAL	14129	Pb	1	7	2012	3	364 EXIDE DR. ON EXIDE PROPERTY	28700	+36.524722	-82.268056	107	0375	Exide Corporation
471633002	Sullivan	INDUSTRIAL	14129	Pb	2	7	2012	3	364 EXIDE DR. ON EXIDE PROPERTY	28700	+36.524722	-82.268056	107	0375	Exide Corporation
471633003	Sullivan	INDUSTRIAL	14129	Pb	1	7	2012	3	364 EXIDE DR.	28700	+36.528056	-82.268333	107	0375	Exide Corporation
471630007	Sullivan	INDUSTRIAL	42101	CO	1	1	2012	Hourly	EASTMAN ROSS N.ROBINSON	28700	+36.534804	-82.517078	041	1026	Tennessee Eastman Company
471630007	Sullivan	INDUSTRIAL	42401	SO2	1	1	2012	Hourly	EASTMAN ROSS N.ROBINSON	28700	+36.534804	-82.517078	039	1026	Tennessee Eastman Company
471630007	Sullivan	INDUSTRIAL	42602	NO2	1	1	2012	Hourly	EASTMAN ROSS N.ROBINSON	28700	+36.534804	-82.517078	042	1026	Tennessee Eastman Company
471631007	Sullivan	SLAMS	88101	PM2.5	1	7	2012	3	1649 D STREET	28700	+36.540654	-82.521667	118	1025	Tennessee Division Of Air Pollution Control
471631007	Sullivan	SPECIAL PURPOSE	88501	PM2.5 Cont	3	1	2012	Hourly	1649 D STREET	28700	+36.540654	-82.521667	716	1025	Tennessee Division Of Air Pollution Control
471632002	Sullivan	SLAMS	44201	O3	1	1	2012	Hourly	HILL ROAD	28700	+36.541193	-82.425964	053	1025	Tennessee Division Of Air Pollution Control
471632003	Sullivan	SLAMS	44201	O3	1	1	2012	Hourly	KETRON MIDDLE SCHOOL ON BLOOMINGDALE RD.	28700	+36.582222	-82.485833	053	1025	Tennessee Division Of Air Pollution Control
471633004	Sullivan	SLAMS	14129	Pb	1	7	2012	6	364 Exide Dr	28700	+36.525556	-82.273333	000	1025	Tennessee Division Of Air Pollution Control
471633004	Sullivan	SLAMS	14129	Pb	2	7	2012	6	364 Exide Dr	28700	+36.525556	-82.273333	000	1025	Tennessee Division Of Air Pollution Control

AQSID	County Name	Monitor Type	Para	Para Name	Monitoring Instrument	Analysis	Ref Mtd ID	Monitor Objective Type	Dominant Source	Measurement Scale	Land Use Type	Location Setting	Date Site Established
471633001	Sullivan	INDUSTRIAL	14129	Pb	PB-TSP/FLAMELESS AA	Flameless Atomic absorption (GFAA); 3M HNO3 Boil 30 min	EQL-0895-107	SOURCE ORIENTED	NULL	NULL	INDUSTRIAL	SUBURBAN	7/1/1994
471633002	Sullivan	INDUSTRIAL	14129	Pb	PB-TSP/FLAMELESS AA	Flameless Atomic absorption (GFAA); 3M HNO3 Boil 30 min	EQL-0895-107	SOURCE ORIENTED	NULL	NULL	INDUSTRIAL	SUBURBAN	7/1/1994
471633002	Sullivan	INDUSTRIAL	14129	Pb	PB-TSP/FLAMELESS AA	Flameless Atomic absorption (GFAA); 3M HNO3 Boil 30 min	EQL-0895-107	SOURCE ORIENTED	NULL	NULL	INDUSTRIAL	SUBURBAN	7/1/1994
471633003	Sullivan	INDUSTRIAL	14129	Pb	PB-TSP/FLAMELESS AA	Flameless Atomic absorption (GFAA); 3M HNO3 Boil 30 min	EQL-0895-107	UPWIND BACKGROUND	NULL	NULL	INDUSTRIAL	SUBURBAN	7/1/1994
471630007	Sullivan	INDUSTRIAL	42101	CO	MONITOR LABS 8310	NONDISPERSIVE INFRARED	RFCA-0979-041	HIGHEST CONCENTRATION	POINT	MIDDLE SCALE	RESIDENTIAL	SUBURBAN	1/1/1974
471630007	Sullivan	INDUSTRIAL	42401	SO2	MONITOR LABS 8850	ULTRA VIOLET STIMULATED FLUORESCENCE	EQSA-0779-039	HIGHEST CONCENTRATION	POINT	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	1/1/1974
471630007	Sullivan	INDUSTRIAL	42602	NO2	MONITOR LABS 8840	CHEMILUMINESCENCE	RFNA-0280-042	HIGHEST CONCENTRATION	POINT	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	1/1/1974
471631007	Sullivan	SLAMS	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	NULL	NULL	RESIDENTIAL	SUBURBAN	10/1/1998
471631007	Sullivan	SPECIAL PURPOSE	88501	PM2.5 Cont		TEOM Gravimetric 50 deg C		UPWIND BACKGROUND	AREA	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	10/1/1998
471632002	Sullivan	SLAMS	44201	O3	MONITOR LABS 8810	ULTRA VIOLET	EQA-0881-053	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	RURAL	1/1/1980
471632003	Sullivan	SLAMS	44201	O3	MONITOR LABS 8810	ULTRA VIOLET	EQA-0881-053	POPULATION EXPOSURE	NULL	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	4/1/1995
471633004	Sullivan	SLAMS	14129	Pb	Pb/TSP	ICP-MS	EQL0310-189	SOURCE ORIENTED	POINT	URBAN SCALE	INDUSTRIAL	URBAN AND CENTER CITY	1/1/2010
471633004	Sullivan	SLAMS	14129	Pb	Pb/TSP	ICP-MS	EQL0310-189	SOURCE ORIENTED	POINT	URBAN SCALE	INDUSTRIAL	URBAN AND CENTER CITY	1/1/2010

## Clarksville, TN-KY Area



Site	AQSID	ParaName	CBSAFP	Address
11	471250006	SO2, PM10, PM10	17300	MEEK'S PROPERTY
12	471250106	SO2	17300	CUMBERLAND HEIGHTS ELEMENTARY SCHOOL
13	471251009	PM2.5, PM2.5 Cont	17300	1514 GOLF CLUB LANE

**Tennessee'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 SO2		42602 NO2		44201 Ozone			81102 PM 10		88101 PM 2.5			88502 PM 2.5 Speciation		88101 or 88501 PM 2.5 Cont		
CBSA Code	Census 2000 / . 2010	CBSA Title (MS Areas)	Operating	Required	Operating	Required	Operating	Required	Operating	Required	Operating	2010 2012 8 Hr DV	Required	Operating	Required	Operating	2010 2012 Annual DV ug/m	2010 2012 24 Hr DV ug/m	Required	Operating	Required	Operating	Required
17300	232000/273949	Clarksville, TN-KY	0	0	0	0	2	0	0	0	0		1	2 <sup>3</sup>	1	1	10.3	22	1	0	0	1	1

<sup>1</sup>State of Kentucky operates an ozone site in Christian County, Kentucky. See Appendix 1 for MSA monitoring agreement prepared by Kentucky for ozone monitoring. <sup>2</sup>State of Tennessee operates a continuous PM<sub>2.5</sub> monitor in Clarksville, Montgomery County, Tennessee. See Appendix 1 for MSA monitoring agreement prepared by Tennessee for continuous PM<sub>2.5</sub> monitoring. <sup>3</sup>Includes collocated monitor.

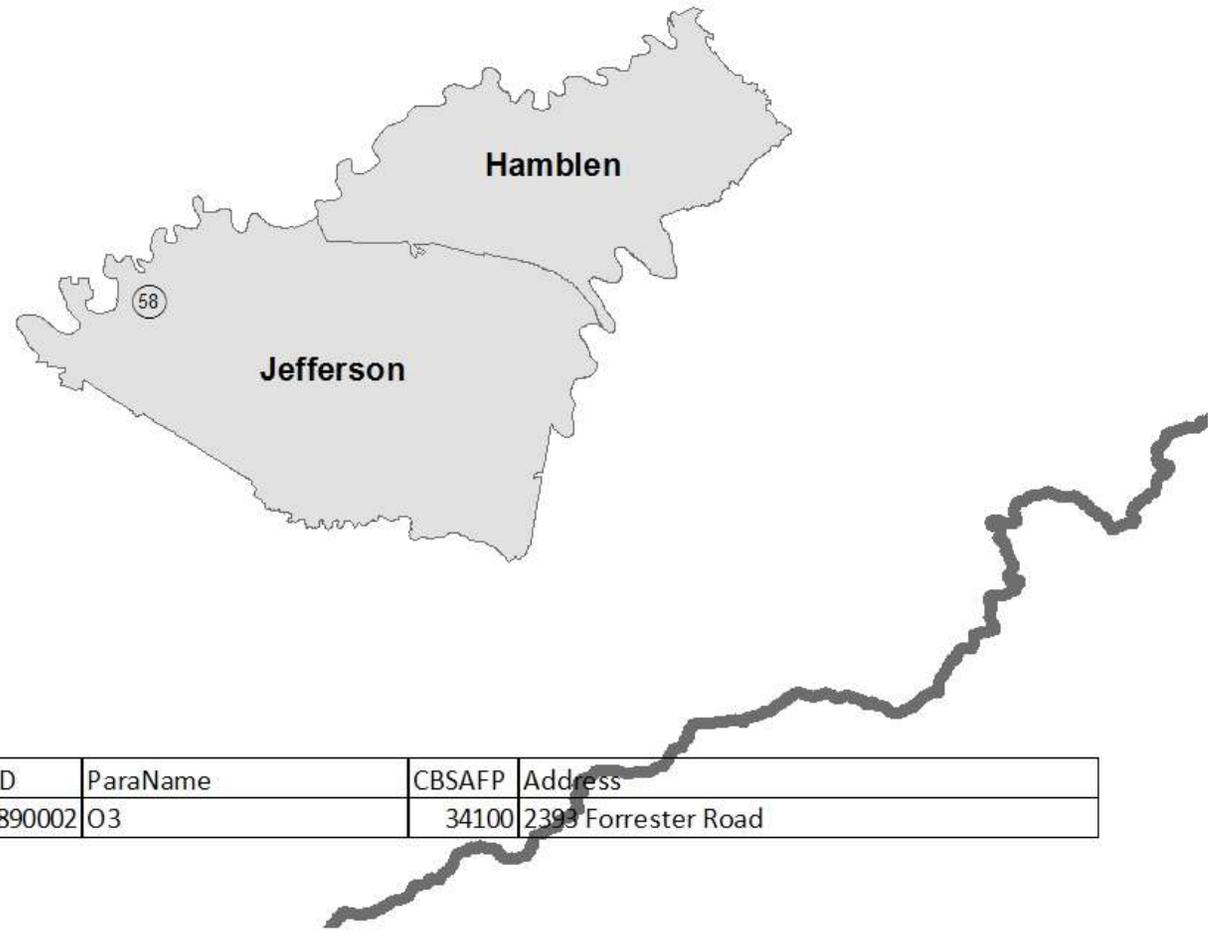
The TEOM POC 3 PM2.5 particulate monitors are generally not suited to be used for comparisons to the annual PM2.5 standards.

There are no plans to relocate or shutdown any existing monitoring sites in the MSA area described. The speciation sampling was approved to be discontinued by EPA and was shut down effective 12/31/2012.

AQSID	County Name	Monitor Type	Para	Para Name	POC	Int	Year	Collection Frequency	Address	CBSA	Lat	Lon	Mtd	RepOrg	RepOrgName
471250006	Montgomery	INDUSTRIAL	81102	PM10	1	7	2012	6	MEEK'S PROPERTY	17300	+36.520298	-87.395500	063	0953	Savage Zinc Incine Company
471250006	Montgomery	INDUSTRIAL	81102	PM10	2	7	2012	6	MEEK'S PROPERTY	17300	+36.520298	-87.395500	063	0953	Savage Zinc Incine Company
471250006	Montgomery	INDUSTRIAL	42401	SO2	1	1	2012	Hourly	MEEK'S PROPERTY	17300	+36.520298	-87.395500	039	1025	Tennessee Division Of Air Pollution Control
471250106	Montgomery	INDUSTRIAL	42401	SO2	1	1	2012	Hourly	CUMBERLAND HEIGHTS ELEMENTARY SCHOOL	17300	+36.505185	-87.397708	039	1025	Tennessee Division Of Air Pollution Control
471251009	Montgomery	SLAMS	88101	PM2.5	1	7	2012	1	1514 GOLF CLUB LANE	17300	+36.514444	-87.327778	118	1025	Tennessee Division Of Air Pollution Control
471251009	Montgomery	SPECIAL PURPOSE	88501	PM2.5 Cont	3	1	2012	Hourly	1514 GOLF CLUB LANE	17300	+36.514444	-87.327778	716	1025	Tennessee Division Of Air Pollution Control

AQSID	County Name	Monitor Type	Para	Para Name	Monitoring Instrument	Analysis	Ref Mtd ID	Monitor Objective Type	Dominant Source	Measurement Scale	Land Use Type	Location Setting	Date Site Established
471250006	Montgomery	INDUSTRIAL	81102	PM10	GMW Model 1200	GRAVIMETRIC	RFPS-1287-063	UNKNOWN	NULL	NULL	INDUSTRIAL	RURAL	8/1/1978
471250006	Montgomery	INDUSTRIAL	81102	PM10	GMW Model 1200	GRAVIMETRIC	RFPS-1287-063	UNKNOWN	NULL	NULL	INDUSTRIAL	RURAL	8/1/1978
471250006	Montgomery	INDUSTRIAL	42401	SO2	MONITOR LABS 8850	ULTRA VIOLET STIMULATED FLUORESCNC	EQSA-0779-039	UNKNOWN	POINT	NEIGHBORHOOD	INDUSTRIAL	RURAL	8/1/1978
471250106	Montgomery	INDUSTRIAL	42401	SO2	MONITOR LABS 8850	ULTRA VIOLET STIMULATED FLUORESCNC	EQSA-0779-039	HIGHEST CONCENTRATION	POINT	MIDDLE SCALE	RESIDENTIAL	RURAL	1/1/1982
471251009	Montgomery	SLAMS	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	NULL	NULL	RESIDENTIAL	SUBURBAN	5/4/1997
471251009	Montgomery	SPECIAL PURPOSE	88501	PM2.5 Cont		TEOM Gravimetric 50 deg C		POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	5/4/1997

# Morristown, TN Area



Site	AQSID	ParaName	CBSAFP	Address
58	470890002	O3	34100	2399 Forrester Road

**Tennessee'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 SO2		42602 NO2		44201 Ozone			81102 PM 10		88101 PM 2.5			88502 PM 2.5 Speciation		88101 or 88501 PM 2.5 Cont		
CBSA Code	Census 2000 / . 2010	CBSA Title (MS Areas)	Operating	Required	Operating	Required	Operating	Required	Operating	Required	Operating	2010 2012 8 Hr DV	Required	Operating	Required	Operating	2010 2012 Annual DV ug/m	2010 2012 24 Hr DV ug/m	Required	Operating	Required	Operating	Required
			34100	123081/ 136608	Morristown, TN	0	0	0	0	0	0	0	0	1	0.078	1	0	0	0			0	0

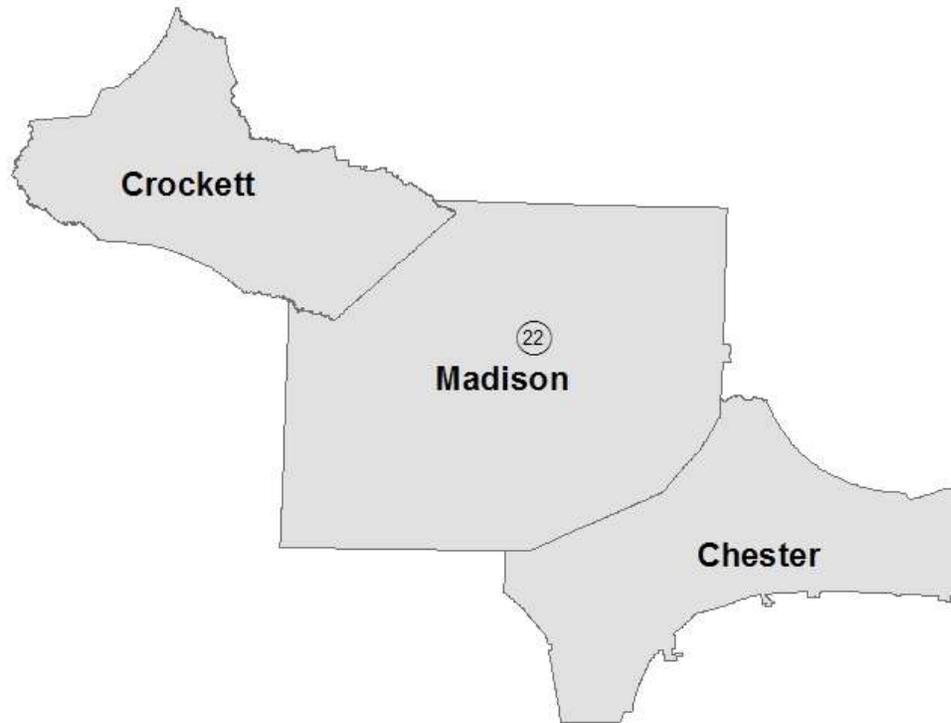
<sup>1</sup>Historical PM10 data does not reflect a need for PM10 monitoring in this area. <sup>2</sup>PM 2.5 monitoring in the adjacent MSA's should be sufficient to assess PM 2.5 levels in this MSA.

There are no plans to relocate or shutdown any existing monitoring sites in the MSA area described.

AQSID	County Name	Monitor Type	Para	Para Name	POC	Int	Year	Collection Frequency	Address	CBSA	Lat	Lon	Mtd	RepOrg	RepOrgName
470890002	Jefferson	SLAMS	44201	O3	1	1	2012	Hourly	2393 FORESTER RD	34100	+36.106	-83.602	087	1025	Tennessee Division Of Air Pollution Control

AQSID	County Name	Monitor Type	Para	Para Name	Monitoring Instrument	Analysis	Ref Mtd ID	Monitor Objective Type	Dominant Source	Measurement Scale	Land Use Type	Location Setting	Date Site Established
470890002	Jefferson	SLAMS	44201	O3	MODEL 400 OZONE ANALYZER	ULTRA VIOLET ABSORPTION	EQOA-0992-087	UNKNOWN	NULL	NULL	AGRICULTURAL	RURAL	2/1/2010

# Jackson, TN Area



Site	AQSID	ParaName	CBSAFP	Address
22	471130006	PM2.5, PM2.5, PM2.5 Cont	27180	1371-A NORTH PARKWAY JACKSON, TN 38301

**Tennessee'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 SO2		42602 NO2		44201 Ozone			81102 PM 10		88101 PM 2.5			88502 PM 2.5 Speciation		88101 or 88501 PM 2.5 Cont		
CBSA Code	Census 2000 / . 2010	CBSA Title (MS Areas)	Operating	Required	Operating	Required	Operating	Required	Operating	Required	Operating	2010 2012 8 Hr DV	Required	Operating	Required	Operating	2010 2012 24 Hr DV ug/m	2010 2012 24 Hr DV ug/m	Required	Operating	Required	Operating	Required
			27180	107377/ 115425	Jackson, TN	0	0	0	0	0	0	0	0	0		0	0	0	2 <sup>1</sup>	9.4	19	0	0

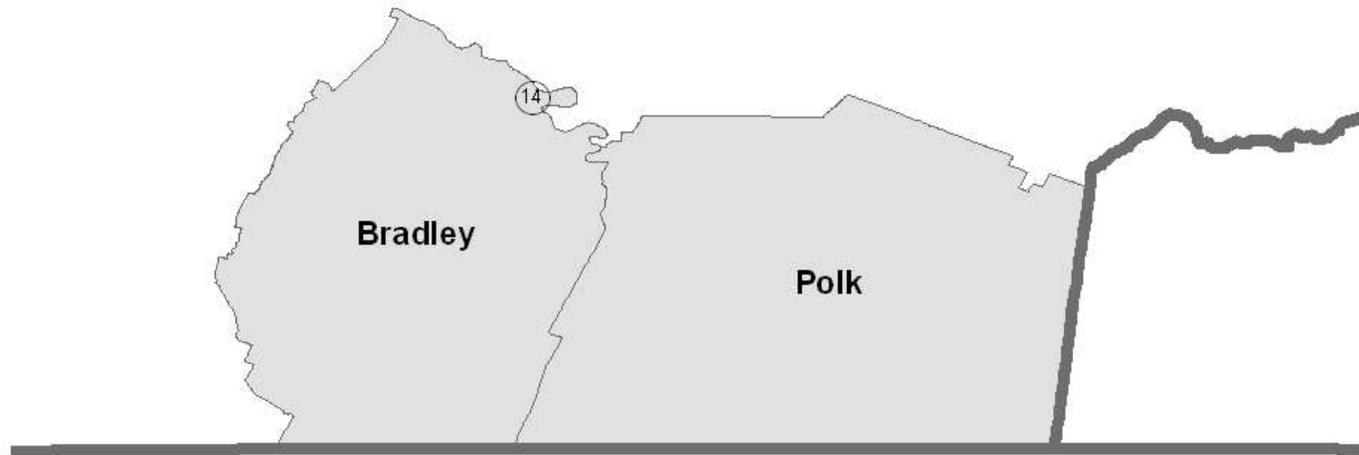
<sup>1</sup> Includes collocated monitor.

The TEOM POC 3 PM2.5 particulate monitors are generally not suited to be used for comparisons to the annual PM2.5 standards.

AQSID	County Name	Monitor Type	Para	Para Name	POC	Int	Year	Collection Frequency	Address	CBSA	Lat	Lon	Mtd	RepOrg	RepOrgName
471130006	Madison	SLAMS	88101	PM2.5	1	7	2012	3	1371-A NORTH PARKWAY JACKSON, TN 38301	27180	+35.651541	-88.809652	118	1025	Tennessee Division Of Air Pollution Control
471130006	Madison	SLAMS	88101	PM2.5	2	7	2012	3	1371-A NORTH PARKWAY JACKSON, TN 38301	27180	+35.651541	-88.809652	118	1025	Tennessee Division Of Air Pollution Control
471130006	Madison	SPECIAL PURPOSE	88501	PM2.5 Cont	3	1	2012	Hourly	1371-A NORTH PARKWAY JACKSON, TN 38301	27180	+35.651541	-88.809652	716	1025	Tennessee Division Of Air Pollution Control

AQSID	County Name	Monitor Type	Para	Para Name	Monitoring Instrument	Analysis	Ref Mtd ID	Monitor Objective Type	Dominant Source	Measurement Scale	Land Use Type	Location Setting	Date Site Established
471130006	Madison	SLAMS	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	11/17/2004
471130006	Madison	SLAMS	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	11/17/2004
471130006	Madison	SPECIAL PURPOSE	88501	PM2.5 Cont		TEOM Gravimetric 50 deg C		POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	11/17/2004

# Cleveland, TN Area



Site	AQSID	ParaName	CBSAFP	Address
14	470110102	SO2	17420	CHARLESTON BOWATERS SOUTH(B-2) WORTH ST.

**Tennessee'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 SO2		42602 NO2		44201 Ozone			81102 PM 10		88101 PM 2.5				88502 PM 2.5 Speciation		88101 or 88501 PM 2.5 Cont	
CBSA Code	Census 2000 / . 2010	CBSA Title (MS Areas)	Operating	Required	Operating	Required	Operating	Required	Operating	Required	Operating	2010 2012 8 Hr DV <sup>1</sup>	Required	Operating	Required	Operating	2010 2012 Annual DV ug/m	2010 2012 24 Hr DV ug/m	Required	Operating	Required	Operating	Required
			17420	104015/ 115788	Cleveland, TN	0	0	0	0	1	0	0	0	1	0.074	1	0	0	1	10.5	22	0	0

<sup>1</sup>Tennessee operates an ozone site on the Meigs/Bradley County line.

Bowaters shut down the NO2 and PM10 monitoring sites located in Bradley and McMinn counties on Sept 30 and July 31, 2012.

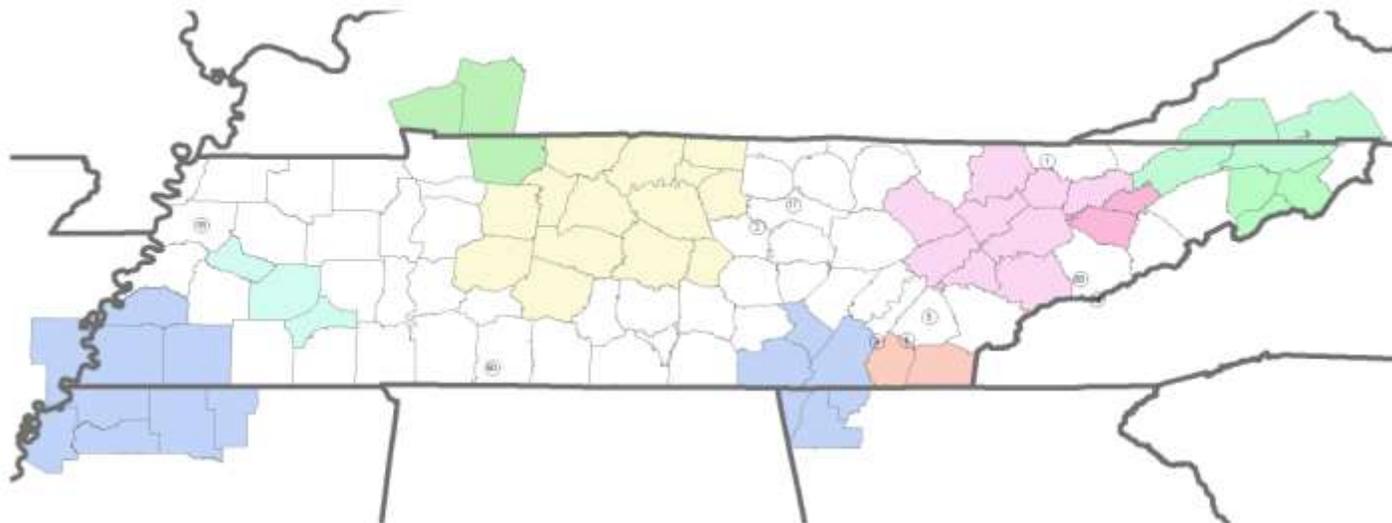
The TEOM POC 3 PM2.5 particulate monitors and the speciation POC 5 STN monitors are generally not suited to be used for comparisons to the annual PM2.5 standards.

TAPCD shut down the collocated PM-10 monitors located at site 47-011-1002 effective 12/31/2012 upon approval by EPA to do so.

AQSID	County Name	Monitor Type	Para	Para Name	POC	Int	Year	Collection Frequency	Address	CBSA	Lat	Lon	Mtd	RepOrg	RepOrgName
470110102	Bradley	INDUSTRIAL	42401	SO2	1	1	2012	Hourly	CHARLESTON BOWATERS SOUTH(B-2) WORTH ST.	17420	+35.283164	-84.759371	009	112	Bowater Southern Paper Company
471071002	McMinn	SPECIAL PURPOSE	88101	PM2.5	1	7	2012	3	SAINT MARK AME ZION CHURCH, 707 NORTH JA	11940	+35.451111	-84.599167	118	1025	Tennessee Division Of Air Pollution Control
471071002	McMinn	SPECIAL PURPOSE	88501	PM2.5 Cont	3	1	2012	Hourly	SAINT MARK AME ZION CHURCH, 707 NORTH JA	11940	+35.451111	-84.599167	716	1025	Tennessee Division Of Air Pollution Control
471210104	Meigs	SPECIAL PURPOSE	44201	O3	1	1	2012	Hourly	8401 HIGHWAY 60		+35.288997	-84.946044	087	1025	Tennessee Division Of Air Pollution Control

AQSID	County Name	Monitor Type	Para	Para Name	Monitoring Instrument	Analysis	Ref Mtd ID	Monitor Objective Type	Dominant Source	Measurement Scale	Land Use Type	Location Setting	Date Site Established
470110102	Bradley	INDUSTRIAL	42401	SO2	THERMO ELECTRON 43	PULSED FLUORESCENT	EQSA-0276-009	UNKNOWN	POINT	MIDDLE SCALE	RESIDENTIAL	URBAN AND CENTER CITY	3/1/1982
471071002	McMinn	SPECIAL PURPOSE	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	COMMERCIAL	URBAN AND CENTER CITY	7/1/1986
471071002	McMinn	SPECIAL PURPOSE	88501	PM2.5 Cont		TEOM Gravimetric 50 deg C		POPULATION EXPOSURE	AREA	NEIGHBORHOOD	COMMERCIAL	URBAN AND CENTER CITY	7/1/1986
471210104	Meigs	SPECIAL PURPOSE	44201	O3	MODEL 400 OZONE ANALYZER	ULTRA VIOLET ABSORPTION	EQOA-0992-087	UNKNOWN	NULL	NULL	RESIDENTIAL	RURAL	2/29/2000

## Monitoring Sites Located In Non-MSA/CBSA Areas In Tennessee



Site	AQSID	ParaName	CBSAFP	Address
1	470259991	O3	0	718 Russell Hill Rd, Speedwell, TN 37870
2	470419991	O3	0	Edgar Evans State Park, Smithville, TN 3
3	471210104	O3	0	8401 HIGHWAY 60
4	471070101	SO2	11940	CALHOUN BOWATERS NORTH(B-1) LAMOUNTVILLE
5	471071002	PM2.5, PM2.5 Cont	11940	SAINT MARK AME ZION CHURCH, 707 NORTH JA
17	471410005	PM2.5	18260	630 EAST 20TH STREET
18	470450004	PM2.5, PM2.5 Cont	20540	175-B GREENWOOD STREET
50	470990002	PM2.5, PM2.5 Cont, PM Spec	29980	BUSBY RD
69	471550101	SO2, O3	42940	GREAT SMOKY MOUNTAIN NP COVE MOUNTAIN
70	471550102	O3	42940	CLINGSMANS DOME, GREAT SMOKY MTNS. NP

Additional monitoring sites are operated in areas outside of the CBSA/MSA areas to help establish background air quality levels and to help define the air quality for those areas less densely populated outside of the metropolitan areas. The TEOM POC 3 PM2.5 particulate monitors and the speciation POC 5 STN monitors are generally not suited to be used for comparisons to the annual PM2.5 standards. There are no plans to relocate or shutdown any existing monitoring sites in the areas described.

AQSID	County Name	Monitor Type	Para	Para Name	POC	Int	Year	Collection Frequency	Address	CBSA	Lat	Lon	Mtd	RepOrg	RepOrgName
471550101	Sevier	NON-EPA FEDERAL	42401	SO2	1	1	2012	Hourly	GREAT SMOKY MOUNTAIN NP COVE MOUNTAIN	42940	+35.696667	-83.609722	009	0745	National Park Service
471550101	Sevier	NON-EPA FEDERAL	44201	O3	1	1	2012	Hourly	GREAT SMOKY MOUNTAIN NP COVE MOUNTAIN	42940	+35.696667	-83.609722	047	0745	National Park Service
471550102	Sevier	NON-EPA FEDERAL	44201	O3	1	1	2012	Hourly	CLINGSMANS DOME, GREAT SMOKY MTNS. NP	42940	+35.562778	-83.498056	047	0745	National Park Service
470450004	Dyer	SLAMS	88101	PM2.5	1	7	2012	3	175-B GREENWOOD STREET	20540	+36.052871	-89.382270	118	1025	Tennessee Division Of Air Pollution Control
470450004	Dyer	SPECIAL PURPOSE	88501	PM2.5 Cont	3	1	2012	Hourly	175-B GREENWOOD STREET	20540	+36.052871	-89.382270	716	1025	Tennessee Division Of Air Pollution Control
470990002	Lawrence	SLAMS	88101	PM2.5	1	7	2012	3	BUSBY RD	29980	+35.116223	-87.470010	118	1025	Tennessee Division Of Air Pollution Control
470990002	Lawrence	SPECIAL PURPOSE	88501	PM2.5 Cont	3	1	2012	Hourly	BUSBY RD	29980	+35.116223	-87.470010	716	1025	Tennessee Division Of Air Pollution Control
470990002	Lawrence	SUPLMNTL SPECIATION	88502	PM Spec	5	7	2012	6	BUSBY RD	29980	+35.116223	-87.470010	810	1025	Tennessee Division Of Air Pollution Control
471410005	Putnam	SPECIAL PURPOSE	88101	PM2.5	1	7	2012	3	630 EAST 20TH STREET	18260	+36.185720	-85.492200	118	1025	Tennessee Division Of Air Pollution Control
471070101	McMinn	SPECIAL PURPOSE	42401	SO2	1	1	2012	Hourly	CALHOUN BOWATERS NORTH(B-1) LAMOUNTVILLE	11940	+35.297330	-84.750760	009	112	Bowater Southern Paper Company

AQSID	County Name	Monitor Type	Para	Para Name	Monitoring Instrument	Analysis	Ref Mtd ID	Monitor Objective Type	Dominant Source	Measurement Scale	Land Use Type	Location Setting	Date Site Established
471550101	Sevier	NON-EPA FEDERAL	42401	SO2	THERMO ELECTRON 43	PULSED FLUORESCENT	EQSA-0276-009	GENERAL/BAC KGROUND	AREA	NEIGHBORHOOD	FOREST	RURAL	7/1/1988
471550101	Sevier	NON-EPA FEDERAL	44201	O3	THERMO ELECTRON 49	ULTRA VIOLET	EQQA-0880-047	UNKNOWN	AREA	NEIGHBORHOOD	FOREST	RURAL	7/1/1988
471550102	Sevier	NON-EPA FEDERAL	44201	O3	THERMO ELECTRON 49	ULTRA VIOLET	EQQA-0880-047	HIGHEST CONCENTRATION	NULL	REGIONAL SCALE	FOREST	RURAL	4/1/1993
470450004	Dyer	SLAMS	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	8/22/1999
470450004	Dyer	SPECIAL PURPOSE	88501	PM2.5 Cont		TEOM Gravimetric 50 deg C		POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	8/22/1999
470990002	Lawrence	SLAMS	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	UPWIND BACKGROUND	NULL	NULL	AGRICULTURAL	RURAL	4/1/1997
470990002	Lawrence	SPECIAL PURPOSE	88501	PM2.5 Cont		TEOM Gravimetric 50 deg C		MAX OZONE CONCENTRATION	NULL	NULL	AGRICULTURAL	RURAL	4/1/1997
470990002	Lawrence	SUPLM NTL SPECIALIZATION	88502	PM Spec		Gravimetric		UPWIND BACKGROUND	AREA	URBAN SCALE	AGRICULTURAL	RURAL	4/1/1997
471410005	Putnam	SPECIAL PURPOSE	88101	PM2.5	R & P CO PLUS MODEL 2025PM SEQ	GRAVIMETRIC	RFPS-0498-118	POPULATION EXPOSURE	AREA	NEIGHBORHOOD	RESIDENTIAL	SUBURBAN	8/15/2006
471070101	McMinn	SPECIAL PURPOSE	42401	SO2	THERMO ELECTRON 43	PULSED FLUORESCENT	EQSA-0276-009	HIGHEST CONCENTRATION	POINT	NEIGHBORHOOD	AGRICULTURAL	SUBURBAN	3/1/1982

## CastNet Monitoring Sites in Tennessee



Site	AQSID	ParaName	CBSAFP	Address
1	470259991	O3	0	718 Russell Hill Rd, Speedwell, TN 37870
2	470419991	O3	0	Edgar Evans State Park, Smithville, TN 3

Site ID	ESP127
Site name	Edgar Evins
County	DeKalb
State abbreviation	TN
Latitude; decimal degrees	36.0388
Longitude; decimal degrees	-85.7331
Elevation; m	302
Operating agency	EPA
Start date	03/15/1988
Primary Land Use	Forest
Terrain surrounding site	Rolling
NADP site code	KY10 <b>EXIT EPA</b>
Distance to nearest NADP site; km	126.835
Does site conform to assumptions of MLM?	No

Map Sat Ter Earth

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Site ID	SPD111
Site name	Speedwell
County	Claiborne
State abbreviation	TN
Latitude; decimal degrees	36.47
Longitude; decimal degrees	-83.8268
Elevation; m	361
Operating agency	EPA
Start date	06/09/1989
Primary Land Use	Agric
Terrain surrounding site	Rolling
NADP site code	TN04 <b>EXIT EPA</b>
Distance to nearest NADP site; km	.096
Does site conform to assumptions of MLM?	Mixed

Map Sat Ter Earth

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<http://epa.gov/castnet/javaweb/ozone.html>

## **Agreement Letters with Agencies Outside of Tennessee**

Appendix 1: MSA Monitoring Agreements Prepared by Kentucky and Tennessee for Ozone and Continuous PM2.5 Monitoring

# Appendix 1: MSA Monitoring Agreements Prepared by Kentucky and Tennessee for Ozone and Continuous PM2.5 Monitoring

Tennessee Agreement Letter (page 1 of 2 pages)



STATE OF TENNESSEE  
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**  
 DIVISION OF AIR POLLUTION CONTROL  
 9TH FLOOR, L & C ANNEX  
 401 CHURCH STREET  
 NASHVILLE, TN 37243-1531



October 25, 2007

John S. Lyons, Director  
 Kentucky Division for Air Quality  
 Kentucky Department for Environmental Protection  
 803 Schenkel Lane  
 Frankfort, KY 40601

Dear Mr. Lyons:

The United States Environmental Protection Agency (EPA) revised monitoring regulations promulgated in Federal Register / Vol. 71, No. 200 / Tuesday, October 17, 2006 / Rules and Regulations, 40 CFR Part 58, Appendix D 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." This revision of the CFR also describes the minimum monitoring requirements for the NAAQS pollutants, including continuous PM 2.5 as it applies to MSA areas where the population is sufficient to warrant monitoring for that pollutant. Tennessee and Kentucky share the Clarksville, TN-KY MSA, which is comprised of Trigg and Christian counties in Kentucky and Stewart and Montgomery counties in Tennessee. The US Census Bureau lists this area as containing a population in excess of 230,000:

CBSA Code	Geographic area	Legal/statistical area description	July 1, 2005 Estimate	2000 Census
17300	Clarksville, TN-KY	Metropolitan Statistical Area	243,665	232,000

The Tennessee Division of Air Pollution Control (TDAPC) currently operates one (1) PM 2.5 FRM monitor and one (1) speciation monitor in Montgomery county and is installing a new continuous PM 2.5 monitor in this area. The TDAPC believes the operation of the existing PM 2.5 monitors; (FRM, speciation and new continuous), are sufficient to properly characterize the particulate air quality in the entire Clarksville, TN-KY MSA and comply with the requirements for both population and concentration based monitoring identified in the revised monitoring regulations as found at FR Vol. 71, No. 200 / Tuesday, October 17, 2006 p. 61321, "Table D-5" and FR Vol. 71, No. 200 / Tuesday, October 17, 2006 p. 61322, "4.7.2 Requirement for Continuous PM2.5 Monitoring". The TDAPC would like to invite the Kentucky Division for Air Quality to participate in Tennessee's annual ambient air monitoring network review. Tennessee commits to sharing with Kentucky any and all quality assured ambient air

John S. Lyons  
October 25, 2007  
Page 2

monitoring data collected in the Tennessee portion of the Clarksville, TN-KY MSA. Tennessee also will notify Kentucky in advance of the intent to relocate or shutdown any of the PM 2.5 monitors referenced above so that adequate monitoring arrangements can be made to meet the entire MSA monitoring requirements for PM 2.5.

Sincerely,

A handwritten signature in black ink, appearing to read "Barry R. Stephens". The signature is written in a cursive style with a large, sweeping flourish at the end.

Barry R. Stephens, PE  
Director, Air Pollution Control Division

BRS/erb  
cc: Beverly Banister, US EPA Region IV



**ENVIRONMENTAL AND PUBLIC PROTECTION CABINET**

**Ernie Fletcher**  
Governor

Department for Environmental Protection  
Division for Air Quality  
803 Schenkel Lane  
Frankfort, Kentucky 40601-1403

**Teresa J. Hill**  
Secretary

November 27, 2007

Barry R. Stephens, PE  
Director  
Division of Air Pollution Control  
9<sup>th</sup> Floor, L & C Annex  
401 Church Street  
Nashville, Tennessee 37243-1531

Dear Mr. <sup>Barry</sup> Stephens:

In a letter from your office dated October 25, 2007, the Tennessee Division of Air Pollution Control (TDAPC) agrees to operate a continuous PM<sub>2.5</sub> monitor in the Clarksville/Hopkinsville metropolitan statistical area (MSA) to meet U.S. EPA's monitoring requirements. The Kentucky Division for Air Quality (DAQ) appreciates TDAPC's commitment to operate the PM<sub>2.5</sub> monitor to meet all of the regulatory requirements for the MSA. DAQ also looks forward to participating in TDAPC's annual ambient air monitoring network review.

In accordance with Table D-2 of Appendix D to 40 CFR Part 58, one (1) ozone monitor is required to be operated in the Clarksville/Hopkinsville MSA. To satisfy the regulatory requirement, the DAQ agrees to operate an ozone monitor at the Hopkinsville monitoring station. DAQ commits to sharing with TDAPC any and all quality assured ambient air monitoring data collected in the Kentucky portion of the Clarksville/Hopkinsville MSA.

In the event that a shutdown or relocation of the ozone monitor is necessary, DAQ will notify TDAPC prior to the shutdown or relocation. Also, DAQ will operate the ozone monitor in accordance with all ambient air monitoring requirements located in 40 CFR Parts 50, 53, and 58.

If you have questions or concerns, please contact me at (502) 573-3382.

Sincerely,

A handwritten signature in black ink, appearing to read "John S. Lyons".

John S. Lyons  
Director

JSL/SOA/bss  
c: Doug Neeley, US EPA Region 4

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