

**State of Alabama
Ambient Air Monitoring
2022/2023 Addendum to the Network
Plan**

April 5, 2023



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Definitions and Acronyms

AAQM	Ambient Air Quality Monitoring
AAQMP	Ambient Air Quality Monitoring Plan
ADEM	Alabama Department of Environmental Management
ARM	Approved Regional Method
ARP	American Rescue Plan Act
AQS	Air Quality System
avg	average
CBSA	Core Based Statistical Area
CFR	<i>Code of Federal Regulations</i>
CO	Carbon Monoxide
CSA	Combined Statistical Area
CSN	Chemical Speciation Network
EPA	Environmental Protection Agency
FEM	Federal Equivalent Method
FRM	Federal Reference Method
HDNREM	Huntsville Division of Natural Resources and Environmental Management
hr	hour
hi-vol	high-volume sampler
JCDH	Jefferson County Department of Health
low-vol	low-volume particulate sampler
m ³	cubic meter
min	minute
ml	milliliter
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NCore	National Core multipollutant monitoring station
O ₃	ozone
PAMS	Photochemical Assessment Monitoring Station
Pb	lead
PM	particulate matter
PM _{2.5}	particulate matter ≤ 2.5 micrometers diameter
PM ₁₀	particulate matter ≤ 10 micrometers diameter
PQAO	primary quality assurance organization
PSD	Prevention of Significant Deterioration
PWEI	Population Weighted Emissions Index
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
SLAMS	State or Local Air Monitoring Station
SO ₂	Sulfur Dioxide
SPM	Special Purpose Monitor
STN (PM _{2.5})	Speciation Trends Network
tpy	tons per year
TSP	Total Suspended Particulate
URG	URG-3000N PM _{2.5} Speciation monitoring carbon-specific sampler
° C	degree Celsius
µg/m ³	micrograms (of pollutant) per cubic meter (of air sampled)
µSA	Micropolitan Statistical Area
≥	greater than or equal to
>	greater than
≤	less than or equal to
<	less than

Introduction

The Alabama Department of Environmental Management (ADEM) announces its intent to issue the Addendum to 2022/2023 Ambient Air Monitoring Plan to the U.S. Environmental Protection Agency. The ADEM is required to produce the annual plan as part of the EPA's amended ambient air monitoring regulations established October 17, 2006.

The ADEM's 2022/2023 Ambient Air Monitoring Plan shows how the state agency plans to meet the EPA regulations for monitoring air quality in the state by assessing monitoring objectives, site appropriateness for air quality characterization, spatial scale represented by each monitor and appropriate new technologies. This document lists changes that occurred after approval of the annual network plan to the current ambient air monitoring network during 2022/2023 season.

Public Review and Comment

The draft Addendum to 2022/2023 Ambient Air Monitoring Plan must be made available for public inspection for thirty (30) days prior to submission to the EPA. This document was placed on the ADEM's website on 02/24/2023 for the 30-day public review period. Comments and response are included at the end of this document.

Table 1 ADEM Ambient Air Monitoring Network as of January 1, 2023

ADEM Site Common Name	AQS ID	Ozone	PM 2.5 Local	PM 2.5 Local Collocated	PM2.5 Speciation	PM2.5 Continuous	PM10 Lo-Vol	PM10 Lo-Vol Collocated	PM10 Continuous	Lead TSP	Lead TSP Collocated	NO2	SO2
Fairhope	01-003-0010	X				X							
Ashland	01-027-0001					X							
Crossville	01-049-1003					X							
Wetumpka Westside Technology	01-051-0004	X											
Gadsden C College	01-055-0010	X ¹				X							
Southside	01-055-0011	X ¹											
Chickasaw	01-097-0003	X				X							X
Bay Road	01-097-2005	X											
Seals Park	01-097-8001						X ²	X ²					
MOMS, ADEM	01-101-1002	X	X			X	X	X					
Decatur	01-103-0011	X				X							
Troy Lead	01-109-0003									X	X		
Phenix City - South Girard School	01-113-0003	X	X	X	X								
Helena	01-117-0004	X											
Lhoist, Montevallo Plant (DRR)	01-117-9001												X
Ward, Sumter Co.	01-119-0003	X				X						X ²	X
Duncanville Middle School	01-125-0011	X				X							
1 - ADEM will be moving ozone monitoring in the Gadsden MSA from Southside to the Gadsden consolidated site													
2 - Anticipated to begin at site													

Summary of changes to 2022/2023 Annual Network Plan

Established a PM10 site in Mobile

When the original plan went to public notice, no details were available regarding the establishment of a PM₁₀ site in the Mobile area to characterize fugitive dust in the Mobile, AL area. This addendum provides the rationale and justification for site selection and planned sampling at the site.

Gadsden MSA

The original network plan proposed closing the Ozone site, **Southside, AQS ID 01-055-0011**. EPA did not approve this proposal. Instead, this addendum will outline a plan to consolidate all monitoring in the Gadsden MSA to one location to increase efficiency and utilize a new building purchased with ARP funding.

Establishment of a new site in Mobile

Executive Summary

As part of the annual network plan, EPA and ADEM agreed to begin PM₁₀ monitoring in Mobile, AL in response to citizen concerns of fugitive dust near the downtown area. EPA has funded this special study, not to exceed three years, to characterize and quantify PM₁₀ concentrations. All efforts were made to locate the site on publicly accessible property in the vicinity of the noted complaints. While multiple sites were visited, ultimately the new air monitoring site is located in a city park, following the predominate wind direction from any potential sources and close to the area of recorded complaints.

ADEM selected a site approximately 1.5 miles to the North-West of the potential sources, on a property owned by the City of Mobile at James Seals Jr Park. ADEM is constructing a site which will meet all regulatory ambient air monitoring site requirements and meet the aesthetic stipulations of the City of Mobile. The site will monitor PM₁₀ two ways: using a FRM filter based method on a 1-in-6 day schedule and a continuous FEM, collecting and reporting concentrations hourly. In addition, if the analyzed PM₁₀ filter exceeds the threshold established in the QAPP, the filter will be sent for further analyses, to characterize the size and content.

Site Selection Process

ADEM began the site selection process by focusing on available public school properties in the area. Through a review of Google Earth, ADEM selected all public schools that appeared to have space to host an air monitoring site. Each site was visited, and potential monitor locations identified.

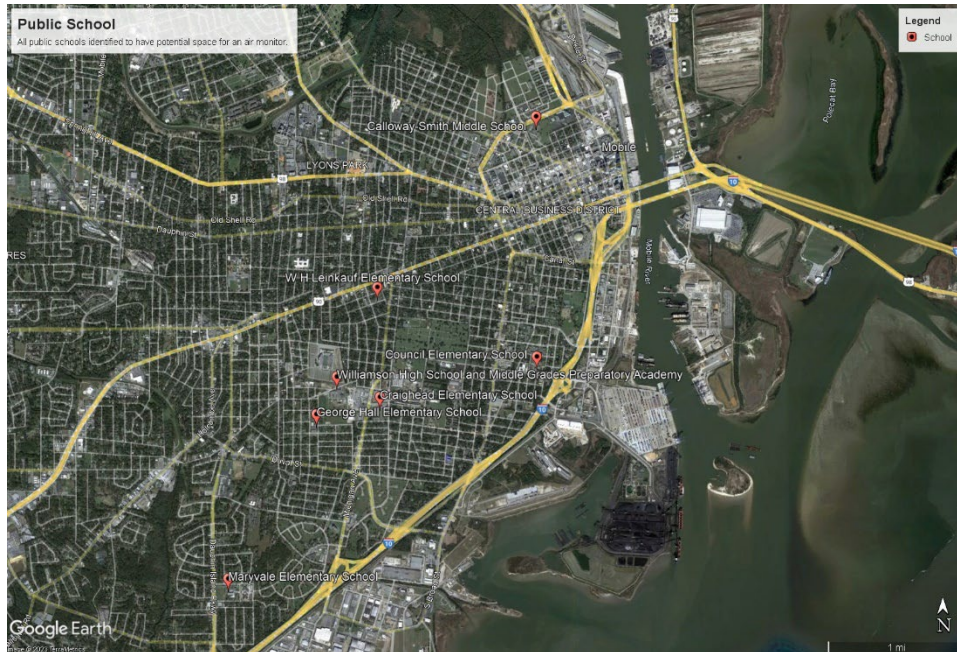


Figure 1 Public School Google Earth Screening

The ADEM Meteorological Section then provided a wind rose of the Mobile area indicating the predominant wind is North to North-West (Figure 2).

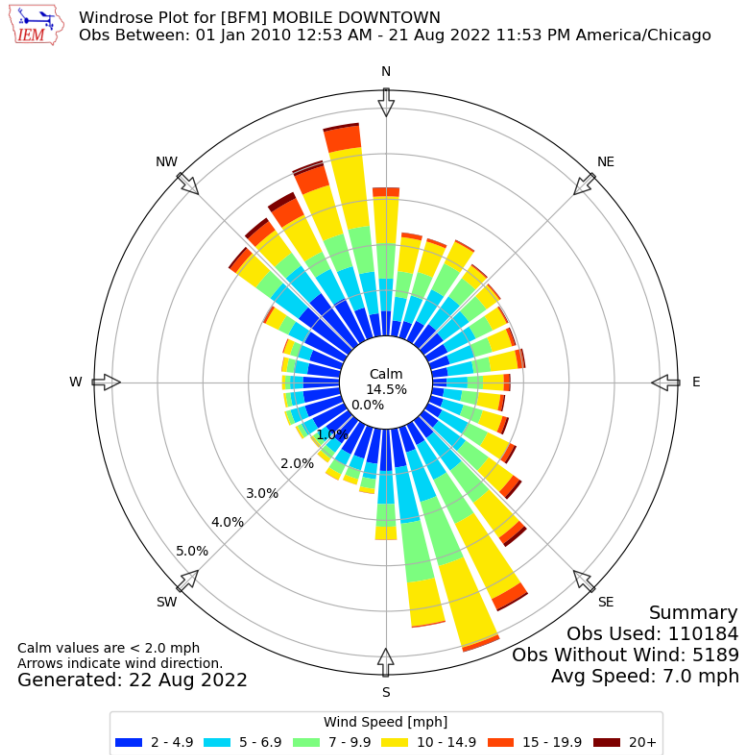


Figure 2 Wind Rose for Mobile, AL

Since most of the suitable schools were directly West of potential sources, it narrowed down the suitable locations to two schools, Council Elementary School and Calloway-Smith Middle School. Both schools were visited on a second trip. Council Elementary School has a large green space across from the school and is located approximately one mile from the potential source. Calloway-Smith Middle School has plenty of space for a site and is actually located next to a historical PM₁₀ site (AQS#01-097-0015; data collected 1990-2002), but its location is approximately three miles from the potential sources and farther North than all of the reported complaint locations. Ultimately both schools were eliminated as potential sites. Council Elementary’s green space is scheduled to be under construction within the coming months to create a new recreational area for the school with ARP funding and Calloway-Smith Middle School was determined to be too far away from the potential sources to satisfy the purpose of this study.

Keeping the focus on public spaces, a second review of Google Earth identified a public park near Council Elementary School, in the correct upwind direction from the potential sources, and within the pathway of previous complaint reports. The park, James Seals Jr. Park and Recreation Center, appeared to fit all of the requirements for the PM₁₀ monitoring site (Figure 3). A visit to the park, confirmed that there were many locations within the park that would be suitable to host a monitoring site. After meeting on-site with city representatives, the City of Mobile granted permission to utilize an area of the park near the tennis courts to set up the monitoring site. The site location is now set.

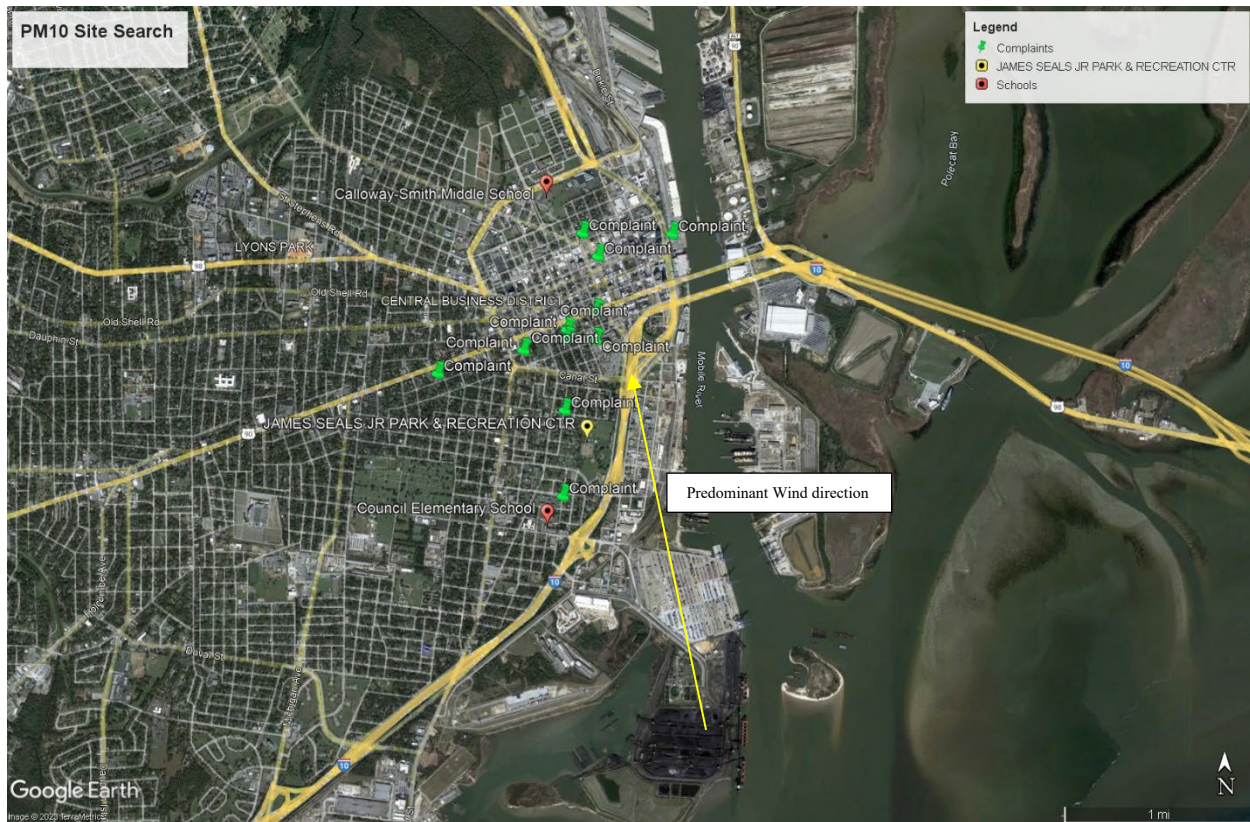


Figure 3 Final Site Selection

Final Site Selected

After extensive research and numerous site visits, the Mobile PM₁₀ ambient air monitoring station will be established at the James Seals Jr. Park in order to characterize PM₁₀ concentrations in the vicinity of downtown Mobile, AL. The site is located in a high-use, city park near I-10 interstate just south of downtown. The terrain surrounding the area is relatively flat and completely urban. The selected site is in-line with the predominant wind direction and within the area of previously recorded complaints. PM₁₀ concentrations measured at this site should be representative of highest concentrations. Close up views of the site can be found in Figures 4 and 5.

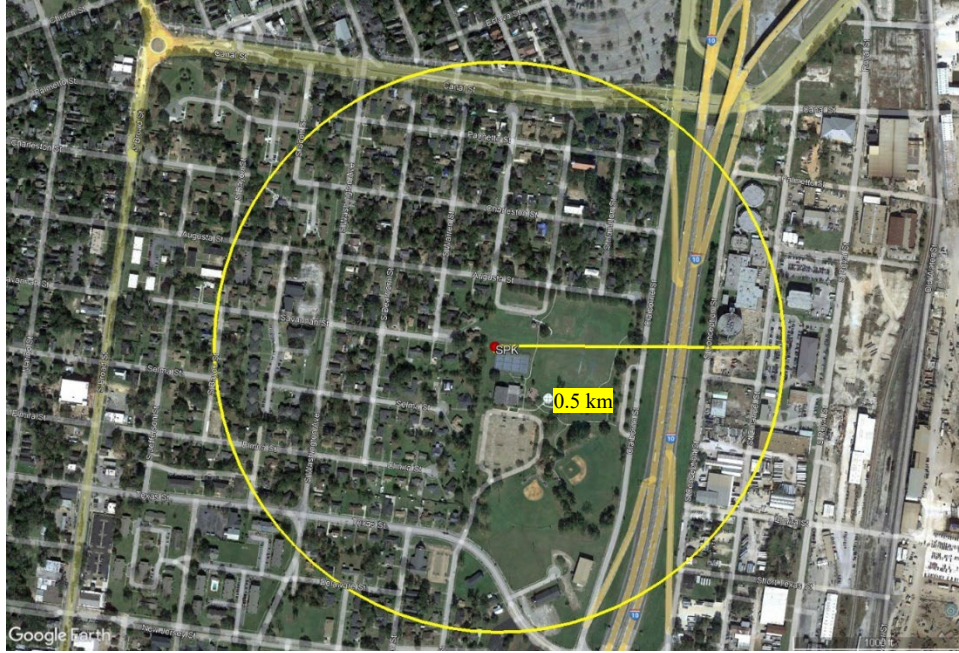


Figure 4 Aerial photo of site from Google Earth

Table 1. Site Information

Station	Latitude (Decimal degrees)	Longitude (Decimal degrees)	Elevation (feet)	Scale
Seals (SPK)	30.679°	-88.046°	12	Neighborhood



Figure 5 Close-Up Google Earth Image Showing Location of Seals Park PM₁₀ Monitoring Station, pre-construction

Based upon the monitoring objective and the site location, the data collected at the Seals Park PM₁₀ site will be source-oriented representativeness on a neighborhood scale. Neighborhood scale defines concentrations within some extended area of the city that has relatively uniform land use with dimensions in the 0.5 to 4.0 kilometer range. It is appropriate for measurements intending to represent highest concentrations, population-oriented impacts, and impacts from sources.

The new PM₁₀ monitoring site will begin collecting data as soon as construction is complete, and monitors are purchased. Filter-based PM₁₀ sampling is anticipated to start no later than May 1, 2023 and continuous sampling will begin as soon as the monitor is acquired. A full site assessment will be conducted after the site is completely operational and published within the 2023/2024 Annual Network Plan this summer. The site will run for a minimum of three years to calculate the PM₁₀ design value for the area. If the data shows that PM₁₀ NAAQS compliance is in question, monitoring will continue past three years to pinpoint causes and to determine the effectiveness of possible corrective measures.

To ensure a complete picture of the ambient PM₁₀ concentration in the Mobile area, the site will operate two regulatory particulate monitors: a manual filter-based reference method to collect samples on a 1-in-6 day schedule and a FEM continuous monitor will collect hourly PM₁₀ concentrations which will be reported to AirNow. The site will also operate a third low flow, non-regulatory sampler, which will be set to collect sample filters on days when the FRM sampler is scheduled to run. After the FRM filter analysis, if the PM₁₀ concentration exceeds the threshold established in the QAPP, the corresponding low-flow, non-regulatory sample filter will be sent for further analysis, to characterize the particle make-up. In addition to the three monitors, meteorological data including wind speed and wind direction will be collected on an hourly basis to correlate with the PM₁₀ concentrations.

Notice of Site Consolidation

Southside (STH AQS: 01-055-0011) and Gadsden CC (GAD AQS: 01-055-0010)

Executive Summary

ADEM received ARP funding for a new air monitoring shelter. These shelters have easy roof access and are much improved over the current aging shelter. The shelter at Southside is over 20 years old and in need of replacement. In order to utilize all of the benefits and improve efficiency, ADEM is consolidating monitoring to one location for both PM and Ozone. Since complete shutdown of the Southside site was not approved in the original network plan, ADEM is now consolidating the two sites. No discontinuation of any monitoring will occur within the Gadsden MSA, only relocation. To utilize all the benefits of a new shelter and allow all site activities to be conducted at one site, the new shelter will be placed at Gadsden CC (AQS ID 01-055-0010). ADEM will consolidate sampling and move ozone monitoring in the MSA from Southside (AQS: 01-055-0011) to Gadsden CC (AQS ID 01-055-0010).(Figure 6)



Figure 6 Distance between GAD and STH

Current Site Analysis



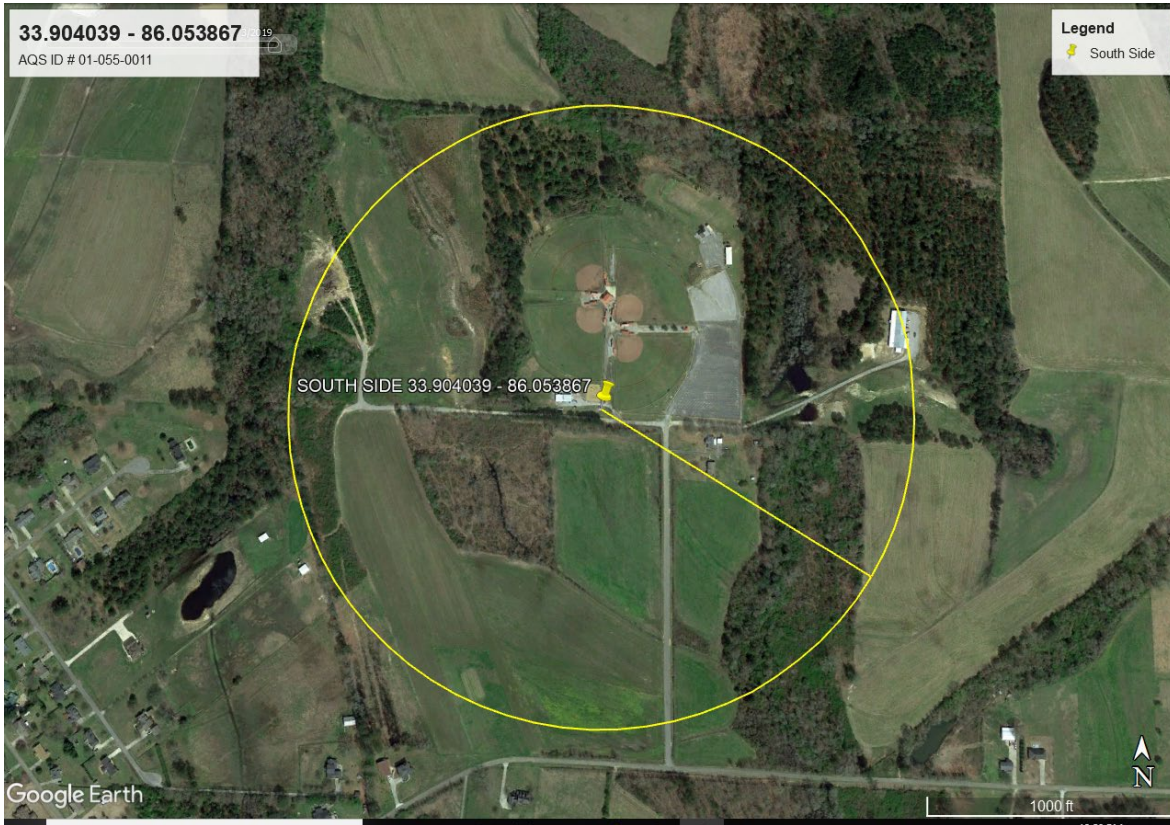
Figure 7 Southside Site in the Gadsden MSA

In accordance with 40 CFR 58.10 regarding relocation requests for State or Local Air Monitoring Stations (SLAMS), ADEM provides the following documentation in support of moving the Southside (STH AQS: 01-055-0011) ozone monitor to Gadsden CC (GAD AQS ID 01-055-0010).

STH (Figure 7) is located in the outskirts of Gadsden, a rural area of low population density. The site encounters a lower traffic count than the proposed location; and, design values have been decreasing for several years now. GAD is located in the Gadsden MSA, only seven miles from STH, and currently only monitors $PM_{2.5}$. STH was evaluated for regulatory compliance on 4/13/2022. The results are included on the following page.

SOUTHSIDE
1450 Parker Anderson Lane, Southside, Etowah County

AQS ID 01-055-0011
33.904039, -86.053867



MSA:

Gadsden 83.8 m from Parker Anderson Lane Property Type: Agricultural (city)



NORTH



SOUTH



EAST



WEST

Parameter	Monitoring Objective/ Scale	Schedule	Start Date	AQS Method Code	Probe/Rain Shield Material	Probe Inlet Height from ground	Distance from probe to supporting structure	Distance from probe to nearest tree dripline	Height of nearest tree/ Direction
Ozone	Highest Concentration/ Neighborhood	Continuous	04/26/2002	047	Teflon	4.1 m	1.7 m	12.5 m	15.2 m Southwest

This site meets all requirements of 40 CFR Part 58.

Evaluation Date: 04/13/2022

Relocation of STH to GAD in the Gadsden MSA

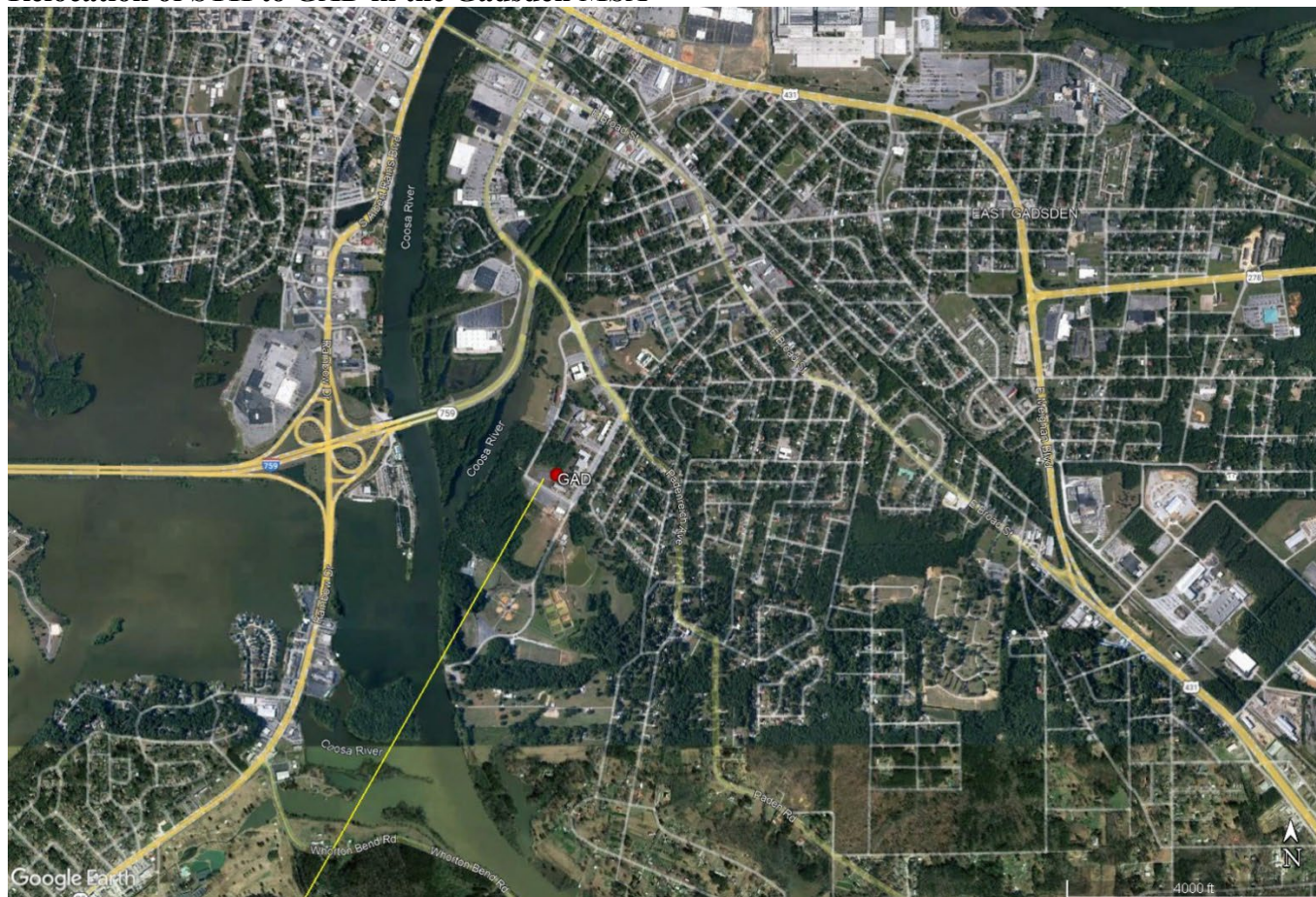
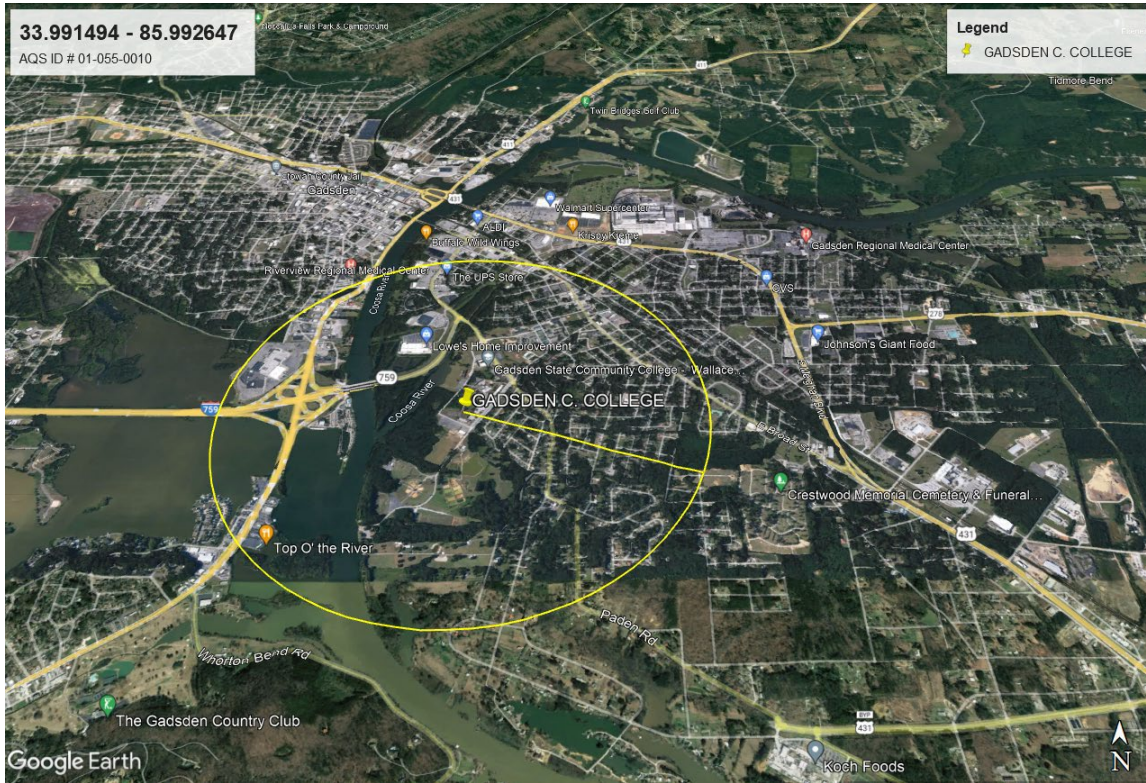


Figure 8 Gadsden CC Site in the Gadsden MSA

The consolidated location, Gadsden CC (GAD) is more urban, located close to the City of Gadsden, and has exposure to more traffic. Ozone concentrations measured at this location would likely be representative of significantly more of the population. GAD was evaluated for regulatory compliance on 2/10/2022. The results are included on the following page.

GADSDEN C COLLEGE
1001 George Wallace Drive, Gadsden, Etowah County

AQS ID 01-055-0010
33.991494, -85.992647



MSA: Gadsden 445 m from George Wallace Drive Property Type: Commercial (college)



NORTH



SOUTH



EAST

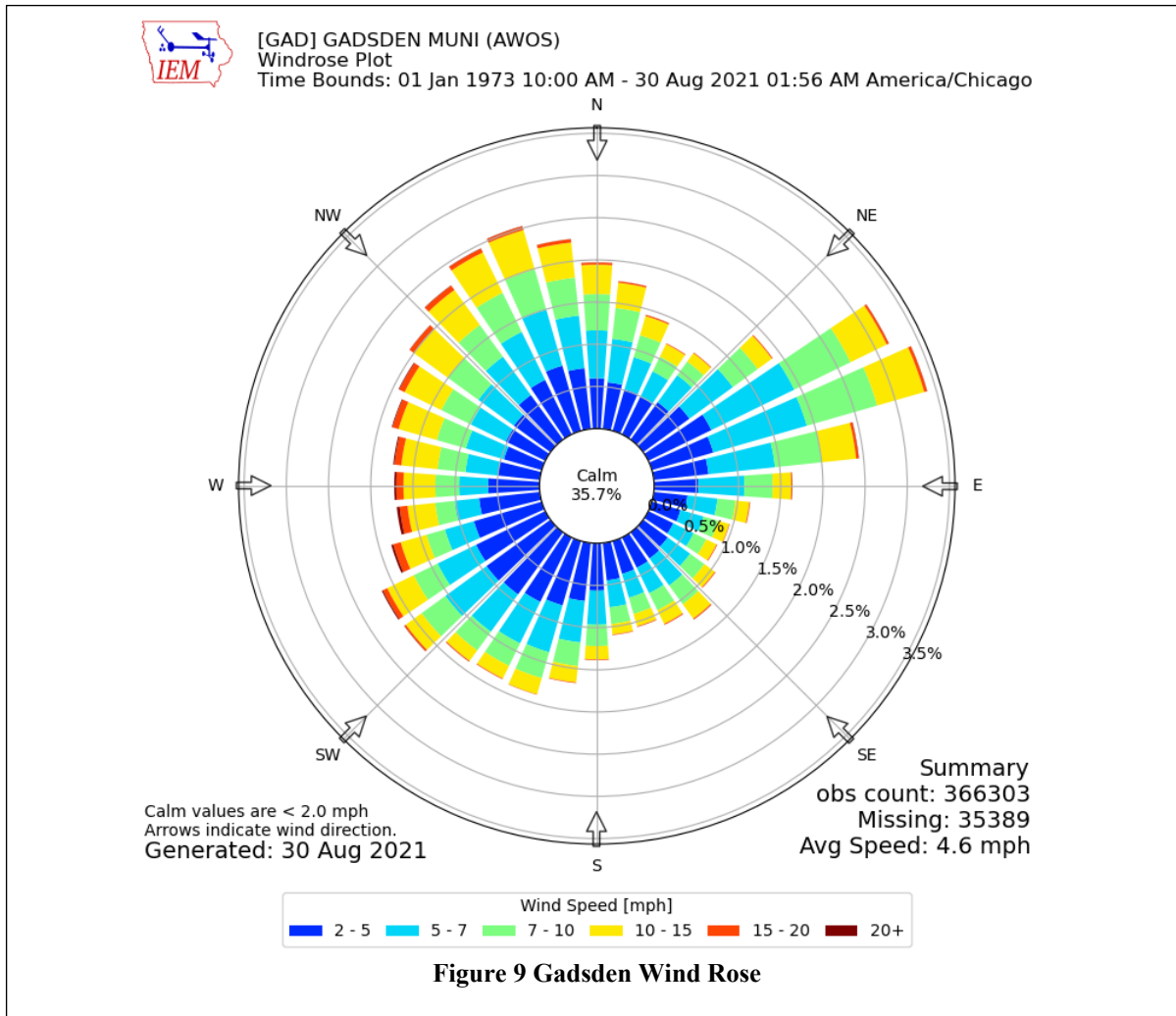


WEST

Parameter	Monitoring Objective/ Scale	Schedule	Start Date	AQS Method Code	Probe/Rain Shield Material	Probe Inlet Height from ground	Distance from probe to supporting structure	Distance from probe to nearest tree dripline	Height of nearest tree/ Direction from probe to tree
BAM2.5	Population Exposure/ Urban	Continuous	12/31/2021	731	Inlet Head	2.1 m	N/A	13.7 m	6.6m North

This site meets all requirements of 40 CFR Part 58.

Evaluation Date: 02/10/2022



Looking at this wind rose, ENE to WSW wind flow is the most common due to terrain lying in the area. While ozone could be potentially higher at Southside, concentrations are continuing to decrease in this MSA and are approaching statewide background concentrations. Therefore, it is unlikely that there would be much of a difference between the two sites.

Installing the new semi-permanent shelter on a school property ensures long-term viability for the site and increased efficiency for the operators.

O3 8-Hr Design Value Data

	3 Yr Avg.			4th High Values					2021 Top 4 8hr Max O3			
	19-21	18-20	17-19	2021	2020	2019	2018	2017	1st	2nd	3rd	4th
Bay Road	57	60	62	54	57	60	64	63	56	54	54	54
Chickasaw	56	59	63	55	54	59	65	65	57	57	56	55
Fairhope	58	61	63	56	57	63	64	64	57	56	56	56
Wetumpka	53	55		54	48	59	60		66	62	56	54
Sumter Co.	54	56	57	54	51	57	60	54	57	56	54	54
Montgomery	56	58	59	57	53	60	62	57	68	58	57	57
Huntsville	61	61	63	64	57	63	65	63	72	71	64	64
Decatur	60	62	63	59	57	64	66	60	68	61	60	59
HSV (Capshaw)	59	59	62	61	54	62	63	61	62	62	61	61
Tuscaloosa	55	58	60	54	52	60	63	58	67	59	55	54
SouthSide	58	60	62	58	53	63	64	61	60	59	59	58
Phenix City	56	58	60	55	54	61	61	59	67	58	55	55
Muscle Shoals			57			56	60	56				
Dothan			57			57	61	55				
Helena	63	65	66	61	59	70	67	61	62	61	61	61
Fairfield	66	67	67	62	62	74	65	64	64	62	62	62
McAdory	64	66	66	61	61	72	66	62	65	63	63	61
Tarrant	62	66	66	57	62	67	70	61	62	61	59	57
Corner	60	61	62	61	57	64	63	61	67	62	62	61
North Bham	66	67	66	63	64	71	67	60	73	68	66	63
Leeds	62	63	64	64	59	63	69	62	65	65	64	64

PM2.5 Annual Design Value Data

	3 Yr Averages					Annual Values					
	2019-2021	2018-2020	2017-2019	2016-2018	2015-2017	2021	2020	2019	2018	2017	2016
Ashland	7.0	7.0	7.4	7.4	7.9	6.8	6.7	7.4	7.0	7.9	7.4
Chickasaw	8.0	8.1	8.1	8.1	8.0	7.7	8.0	8.3	8.1	8.0	8.1
Childersburg					9.1					8.7	8.6
Columbus Airport	8.4	8.3	8.6	8.6	8.9	8.5	8.1	8.7	8.2	9.0	8.7
Crossville	7.4	7.2	7.5	7.6	8.3	7.7	7.1	7.5	7.0	8.0	7.7
Decatur	7.3	7.4	7.5	7.5	7.9	7.5	6.9	7.6	7.4	7.7	7.4
Dothan			8.1	7.8	7.7			8.1	7.7	8.6	7.1
Fairhope	7.6	7.5	7.3	7.3	7.7	7.3	7.9	7.5	7.1	7.4	7.2
Gadsden	8.2	8.0	8.3	8.3	8.7	8.3	7.9	8.3	7.8	8.9	8.2
Huntsville	7.3	7.3	7.4	7.5	7.7	7.4	7.1	7.4	7.4	7.5	7.5
Montgomery 1&2	8.3	8.4	8.8	8.6	8.8	7.9	7.9	9.0	8.4	8.9	8.5
Muscle Shoals				7.5	7.9				7.5	7.4	7.5
Phenix City	9.3	9.1				9.8	8.5	9.5	9.1		
Tuscaloosa	7.8	7.7	8.0	7.8	8.1	7.9	7.5	7.9	7.7	8.2	7.4
Sumter(Ward)						6.3					
Jefferson County Monitors Only											
	3 Yr Averages					Annual Values					
	2019-2021	2018-2020	2017-2019	2016-2018	2015-2017	2021	2020	2019	2018	2017	2016
Leeds	8.2	8.6	8.8	9.1	9.4	8.0	8.2	8.3	9.2	8.9	9.3
McAdory	8.4	8.5	8.8	8.7	9.0	8.2	8.2	8.7	8.7	8.9	8.5
NBHM	11.0	10.0	10.0	10.0	10.4	12.6	10.1	10.4	9.6	10.2	10.3
Wylam	8.4	8.5	9.0	9.0	9.5	8.7	8.0	8.6	8.8	9.5	8.7
W BHM	9.6	9.8	10.0	10.5		9.5	9.8	9.3	10.2	10.3	10.8

PM_{2.5} 24-hr Design Value Data

	3 Year Averages					24-Hr Values					
	2019-2021	2018-2020	2017-2019	2016-2018	2015-2017	2021	2020	2019	2018	2017	2016
Ashland	15	15	16	15	18	15.9	14.2	15.1	14.8	16.8	13.1
Chickasaw	16	17	17	17	17	15.5	16.3	16.6	16.9	17.4	15.7
Childersburg					18					18.8	13.9
Crossville	17	16	16	15	16	17.8	16.6	15.1	15.8	16.9	13.4
Decatur	14	15	15	15	15	14.3	13.7	14.4	16.3	15.5	13.3
Dothan			17	16	15			16.8	16.5	18.3	13
Fairhope	15	16	17	17	17	14.6	16.7	15.1	17.1	18.9	13.8
Gadsden	20	18	16	16	17	21.1	22.7	15.7	14.9	17.5	14.2
Huntsville	16	16	16	15	16	16.6	17.1	14.4	15.9	16.8	12.5
Montgomery 1&2	19	19	19	19	20	17.5	23.9	16.1	18.4	22.1	17.7
Muscle Shoals				16	16				16.2	15.5	15.8
Phenix City (new)	23	18	18	18		30.4	19.4	18.6	20.8		
Columbus Airport	21	18	19	18	19	24.4	19	19.2	16.5	20.5	16.5
Tuscaloosa	17	16	17	16	16	19.6	16.6	15.4	17	18.4	13.2
Sumter(Ward)						15.5					
Jefferson County Monitors Only											
	3 Year Averages					24-Hr Values					
	2019-2021	2018-2020	2017-2019	2016-2018	2015-2017	2021	2020	2019	2018	2017	2016
Leeds	16	17	18	18	17	15.8	15.4	15.3	21.6	15.6	15.7
McAdory	17	16	18	17	18	20.2	14.4	16	17.5	19.6	14.4
NBHM	25	22	21	21	22	29.7	23.8	21.3	21.4	21.7	20.2
Wylam	18	18	17	18	18	18.1	19.4	16.1	17	19.1	16.8
W BHM	22	22	21	22	22	20.1	25.4	19.1	22.2	21.2	21.4
	Incomplete data (over 12 consecutive quarters)										