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# 2021-2022 Annual Monitoring Network Plan for the North Carolina Division of Air Quality

#### Volume 2

# Site Descriptions by Division of Air Quality Regional Office and Metropolitan Statistical Area

# C. The Mooresville Monitoring Region



July 1, 2021



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#### C. The Mooresville Monitoring Region

The Mooresville monitoring region, shown in Figure C1, consists of four areas: (1) the eastern portion of the Hickory-Lenoir-Morganton metropolitan statistical area, or MSA, (Alexander and Catawba counties), (2) Cleveland County, (3) the Charlotte MSA - Cabarrus, Gaston, Iredell, Lincoln, Mecklenburg, Rowan and Union counties and (4) Stanly County.



**Figure C1. The Mooresville monitoring region**The dots show the approximate locations of most monitoring sites in this region

#### (1) Hickory-Lenoir-Morganton MSA

The Hickory-Lenoir-Morganton MSA consists of four counties: Alexander, Burke, Caldwell and Catawba County. The major urban areas are the Cities of Hickory, Lenoir and Morganton. The North Carolina Division of Air Quality, or DAQ, currently operates three monitoring sites in the Hickory-Lenoir-Morganton MSA. These sites are located at Taylorsville-Liledoun in Alexander County, Lenoir in Caldwell County and the Hickory Water Tower in Catawba County. Figure C2 shows the locations of these monitors.



Figure C2. Locations of monitors in the Hickory-Lenoir-Morganton MSA

A is the Lenoir ozone monitoring site; B is the Taylorsville-Liledoun ozone monitoring site; C is the Hickory particle monitoring site. Circles around the monitors show the scale of representation: Lenoir is regional - 50 Km plus; Taylorsville Liledoun is urban - 4 to 50 Km; Hickory is neighborhood – 0.5 to 4 Km.

At the Taylorsville-Liledoun site, DAQ operates a seasonal ozone monitor and a rotating PM<sub>10</sub> monitor that operates 12-months every third year. Figure C3 shows the site. Table C1 summarizes monitoring information for the site. Figure C4 through Figure C7 show views looking north, east, south and west. DAQ established this site as the downwind site for the Hickory-Lenoir-Morganton MSA in 2013 to replace the Taylorsville-Waggin Trail site. The division requested and received permission to combine the 2014 and 2015 data from the Liledoun site with the 2013 data from the Taylorsville site to provide a valid design value for recommended designations due in 2016. This site is the design value monitor for the MSA. Until this year, the regulations at 40 CFR Part 58, Appendix D required the Hickory-Lenoir-Morganton MSA to have two ozone monitoring sites. The 2018-2020 design value is less than 85 percent of the national ambient air quality standard, or NAAQS, so the regulations currently require only one monitor for the MSA. The DAQ does not plan to shut down either of the two ozone monitors in the MSA at this time.



Figure C3. Taylorsville Liledoun ozone and particle monitoring site, 37-003-0005

Table C1.	Table C1. Site Table for Taylorsville-Liledoun											
Site Name:	Taylors	ville Liledoun		AQS S	ite Ider	ntification	Number:	er: 37-003-0005				
Location:	700 Lile	doun Road, Tay	lorsville, North	n Carolina								
CBSA:	H	lickory-Lenoir-N	Morganton, NC			CBSA	#:	258	860			
Latitude 3	5.9138	Longitude	-81.1910	Elevation		365 meters						
Parameter					Meth	od	Sample					
Name	Metho	d			Refer	ence ID	Duration	ı S	Sampling Schedule			
Ozone	Instrun	nental with ultra	violet photomo	etry, 047	EQOA	A-0880-04	7 1-Hour	N	March 1 to Oct. 31			
PM10 total								7	Year-round, every			
0-10um STP	ne Beta Attenuat	), 122	EQPN	1-0798-12	2 1-hour	t.	hird year					
<b>Date Monito</b>	r Establi	shed: Ozone			•			Aug	g. 2, 2013			

Table C1. Site T	able	for	Taylors	ville-I	iledour	1						
		I	PM10 tota	10-10u	m STP						March	23, 2016
Nearest Road:	Lile	edou	n Road	T	raffic Co	unt:	6400		Y	ear of C	ount:	2016
Parameter Name	Dista	nce	to Road	Direc	ction to Road Monitor Type			Sta	tement	of Purp	oose	
Ozone	2	19 m	eters	S	Southeast SLAMS			Real-time AQI reporting and forecasting. Compliance w/NAA				
PM10 total 0- 10um STP	2	19 m	eters	S	Special Prev				vention erioration	_	ficant Modeling	
Parameter Name	M	onit	oring Obj	jective	Scale Suitable for Scale Comparison to NAAQS			Proposal to Move or Change				
Ozone	G	enera	al Backgro	ound	Urban		Y	es		None		
PM10 total 0-10um STP	G	enera	al Backgro	ound	Urban		Y	'es		Will op 6/30/20		/1/2019 to
						Meet	s Part 5	58 Requir	eme	nts for:		
Parameter Name			Appen	dix A	App	endix	<b>C</b>	A	ppen	dix D		Appendix E
Ozone			Ye	S		Yes			Y	es		Yes
PM10 total 0-10um	STP		Ye	S		Yes		Yes-	- not	required	1	Yes
Parameter Name		Pro	be Heigh	t	Distanc	e to S	Support	Di	stan	ce to Tro	ees	Obstacles
Ozone	2zone 3.65 meters 1.06		1.06 m	06 meters		> 2	0 meters		None			
PM10 total 0-10um STP		- 1	2.3876 me	ters	2.032 meters			> 20 meters			None	

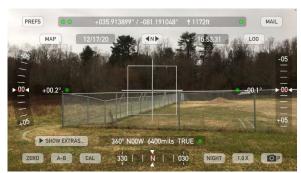


Figure C4. Looking north from the Taylorsville-Liledoun site



Figure C5. Looking west from the Taylorsville-Liledoun site



Figure C6. Looking east from the Taylorsville-Liledoun site



Figure C7. Looking south from the Taylorsville-Liledoun site

DAQ established the Taylorsville-Liledoun site on Aug. 2, 2013, after the division discovered in January 2013 that Alexander County planned to establish a vehicle maintenance facility at the Waggin Trail site. Because these construction plans, once implemented, made the Waggin Trail

site unacceptable for ozone monitoring, DAQ identified the Taylorsville-Liledoun site for the ozone monitor. As shown in Figure C8, the Taylorsville-Liledoun site is located almost exactly one mile south of the former Waggin Trail site, behind the Alexander County Board of Education building, 700 Liledoun Road, Taylorsville. The State Climate Office operates a meteorological tower in the same area where the ozone monitor is located. The Waggin Trail and Taylorsville-Liledoun site operated simultaneously from Aug. 2 through Oct. 31, 2013.



Figure C8. Relationship between old Waggin Trail site (north) and Taylorsville Liledoun site (south)

At **Lenoir**, 37-027-0003, the DAQ operates a seasonal ozone monitor, the second required ozone-monitor for the MSA. In 2013, DAQ added a special purpose sulfur dioxide monitor at Lenoir that operates every third year to provide data for prevention of significant deterioration,

PSD, modeling for industrial expansion. Figure C9 shows the site. Table C2 summarizes monitoring information for the site. Figure C10 to Figure C17 provide views looking north, northeast, east, southeast, south, southwest, west and northwest from the site. Before the start of the 2021 ozone season, DAQ replaced the shelter at the site.



Figure C9. Lenoir ozone and sulfur dioxide monitoring site

#### Table C2. Site Table for Lenoir

Table C2. S	100 11	tore ror	LCHUII									
Site Name:	Leno	ir				AQS S	ite Ident	ification <b>N</b>	Number:	37-0	027-0003	
Location:	291 N	Juway Ci	rcle, Lenoir	, Nort	th Carolin	na						
MSA:		Hickor	y-Lenoir-M	organ	ton, NC			CBSA #	:	258	60	
Latitude	35.935	5833 Lo	ngitude	-81.5	30278	Datum	: WG	S84	Elevation		366 meters	
Parameter							Metho	d	Sample		Sampling	
Name	Meth	od					Refere	nce ID	Duration	1	Schedule	
Ozone	Instru	ımental w	ith ultra vio	olet pl	notometry	y, 047	EQOA-	-0880-047	1-Hour		March 1 to Oct. 31	
Sulfur	Instru	ımental w	ith pulsed f	luore	scence, 0	60					Year-round; every	
dioxide			•	EQSA-0486-060 1-Hour third year						third year		
Data Manita	n Esta	hlishad.	Ozone							Jan.	1, 1981	
Date Monitor Established: Sulfur dioxide										Jan. 1, 2013		
Nearest Road: Nuway Circle Traffic Count:					nt:	5800		Year of C	ount:	2018		
Parameter N	lame	Distanc	e to Road	Dir	ection to	Road	Monito	or Type	Statemen	t of P	urpose	
									Real-time	AQI 1	reporting & fore-	
Ozone		146	meters		East		SLAM	S	casting. C	ompli	ance w/NAAQS.	
									Prevention	n of si	gnificant	
Sulfur dioxid	e	146	meters		East		Special	purpose	deteriorati	ion, P	SD, Modeling	
							Suitab	le for				
Parameter N	lame		ring Objec		Scale	Con	nparison	to NAAQ	S Prop	osal to	Move or Change	
Ozone		Genera	al backgrou	nd	Regiona	al Yes None			None			
Sulfur dioxid	e	Genera	al backgrou	nd	Regiona	al Yes None			None			
						Me	ets Part	58 Requi	rements:			
Parameter N	Parameter Name Appendix A Appendi			ppendi	κ C	pendix D		Appendix E				
Ozone			Ye	NG.		Yes	Yes				Yes	

Sulfur dioxide	Yes	Yes	Yes – not required	Yes
Parameter Name	Probe Height	Distance to Support	Distance to Trees	Obstacles
Ozone	4.46 meters	1.60 meters	>20 meters	None
Sulfur dioxide	4.39 meters	1.5748 meter	>20 meters	None



Figure C10. Looking north from the Lenoir site



Figure C11. Looking northwest from the Lenoir site



Figure C12. Looking west from the Lenoir site



Figure C13. Looking northeast from the Lenoir site



Figure C14. Looking east from the Lenoir site



Figure C15. Looking southeast from the Lenoir site







Figure C17. Looking south from the Lenoir site

At the Hickory site, DAQ operates collocated continuous fine particle monitors. The division shut down the collocated one-in-six-day federal reference method or FRM fine particle monitor on June 12, 2019. DAQ shut down the speciation fine particle SASS and University Research Glass, or URG, monitors and the two one-in-six-day high volume PM10 monitors in 2014. In 2015, DAQ added a second continuous fine particle monitor that recently received equivalency status to the site so DAQ could evaluate its performance. On Jan. 1, 2017, the division made the second continuous monitor the primary monitor and shut down the primary FRM monitor at the site. Figure C18 through Figure C26 show the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest. Table C3 summarizes monitoring information for the site.



Figure C18. Hickory fine particle monitoring site



Figure C19. Looking north from the Hickory site



Figure C20. Looking northwest from the Hickory site



Figure C21. Looking west from the Hickory site



Figure C22. Looking southwest from the Hickory site



Figure C23. Looking northeast from the Hickory site



Figure C24. Looking east from the Hickory site



Figure C25. Looking southeast from the Hickory site



Figure C26. Looking south from the Hickory site

Table C3. Site Table for Hickory

Site Name:	Site Name: Hickory							Identi	ification N	umber	37-0	35-0004	1
Location:		Street, H	lickory,	, North Car	olina								
MSA:		Hickory	-Lenoii	r-Morganto	on, NC			(	CBSA #:		2580	60	
Latitude		35.7288	89	Longitud	de	-81.36	5555	6 1	Datum:		WG	S84	
Elevation		333 met	ers										
Parameter Na	ame	Met	hod						Method Reference	e ID	Samp Dura		Sampling Schedule
PM 2.5 local c BAM 1022, pr		Met	One B	AM-1022 N	Mass Mo	onitor v	w/ V	'SCC	EQPM-10	013-209	9 1-Hou	ır	Year Round
PM 2.5 local c BAM 1022, co		Met	One B	AM-1022 N	Mass Mo	onitor v	w/ V	'SCC	EQPM-10	013-209	9 1-Hou	ır	Year Round
Data Manitary	Estable:	Pl	M 2.5 lo	ocal condit	ions, BA	M 10	22					Sept. 14	4, 2015
Date Monitor	Lstablis	nea: Pi	M 2.5 lo	ocal conditi	ions, BA	M 10	22					July 14	, 2019
Nearest Road	:		2 <sup>nd</sup> Av	enue SW		Traff	ic C	ount:	3200		Year of	Count:	2017
	Distance to					ion							
Parameter Name Road					to Road Monitor			nitor T	Гуре	ment of	Purpos	e	
PM 2.5 local c	onditions	litions, BAM				th					liance w		
1022			21.3	south	east	SLA	AMS		-	_	-	d monitor.	
PM 2.5 local c	onditions	, BAM			Sou	th	SLA	AMS, Ç				/NAAQ	S. AQI
1022			22.2	5 meters	southeast Collocated			1	ing. SIP	_	d monitor.		
Parameter Na	ame			Monito Objec			le		itable for son to NAAQS			osal to or Change	
PM 2.5 local c		BAM	1022.	Popula									
primary		,	,	Expo		Nei	ghbo	orhood	Yes		Yes		
PM 2.5 local c	onditions	, BAM	1022,	Popula									
collocated				Expo	sure	Neig	ghbo	orhood		Yes		None	
					Meets	Part	58	Meet	ts Part 58	Meet	ts Part 5	8 Me	ets Part 58
						endix .			endix C		endix D		ppendix E
	Parameter Name					iremei	nts	Requ	irements	•	iiremen	ts Re	quirements
PM 2.5 local conditions, BAM 1022, primary						Yes			Yes		Yes		Yes
PM 2.5 local c	PM 2.5 local conditions, BAM 1022, collocated				`	Yes			Yes	<u> </u>	Yes		Yes
Parameter Na	Parameter Name				Probe Height		ıt	Distan	ce to Supp		istance 'rees	to	Obstacles
PM 2.5 local conditions, BAM 1022, primary				2.4892 meters		rs	s 2.1082 m		1082 meters >		eters	None	
PM 2.5 local of	M 2.5 local conditions, BAM 1022, collocated				2.3368 meters		rs	2.0574 meters		ers >20 meter		eters	None

DAQ shut down both one-in-six-day PM<sub>10</sub> monitors on Dec. 31, 2014. Title 40 CFR Part 58, Appendix D did not require the PM<sub>10</sub> monitor, the division did not use the PM<sub>10</sub> data from this site for permit modeling and the monitor was no longer needed to ensure an adequate PM<sub>10</sub> network. The United States Environmental Protection Agency, or EPA, ended the funding for the analysis of the SASS and URG samples in January 2015. Thus, DAQ also shut down these monitors in 2014. At the end of December 2015, DAQ replaced the well impactor ninety-six, or WINS, on the FRM with a very sharp cut cyclone, or VSCC. DAQ made this change because the VSCC is easier and less expensive to maintain.

In the future, Highway US 321 going past the site will be widened. Construction will dictate some temporary changes and rerouting of traffic lanes, closure of an overpass near the

site, as well as the striking of new right of ways near the site on the two roads that border the water tower property. The road itself will not increase, just the right of way distance, and maybe some sidewalk/improvements area would increase. On May 12, 2021, the City of Hickory contacted DAQ about moving the monitors approximately 25 meters northward towards 1<sup>st</sup> Avenue SW as shown in Figure 27. The monitors will remain at least 17 meters from the nearest travel lane on all sides. As shown in the wind rose in the inset of Figure 27, the predominant winds at the Hickory airport are from the south and south southwest. DOT has not provided a schedule for when the move will occur.



Figure 27. Aerial view of the Hickory fine particle monitoring site showing relative positions of the current location and proposed location

The Hickory-Lenoir-Morganton MSA did not need to do lead monitoring to meet the 2010 **lead monitoring** requirements. It has no facilities within the MSA reporting over one half ton of lead emissions to the air. <sup>1</sup>

The 2015 **ozone monitoring** requirements do not require additional monitors in the Hickory-Lenoir-Morganton MSA. The MSA has the minimum number of monitors required by 40 CFR Part 58, Appendix D for population exposure monitoring in urban areas. Seasonal ozone monitoring starts on March 1 instead of April 1 beginning in 2017.

The Hickory-Lenoir-Morganton MSA did not need additional monitors to comply with the 2010 **nitrogen dioxide monitoring** requirements. It is too small to require area-wide monitors or near-roadway monitoring.

DAQ will not need to add source-oriented monitors in the Hickory-Lenoir-Morganton MSA to comply with the 2010 **sulfur dioxide monitoring** requirements for source-oriented monitoring.

<sup>&</sup>lt;sup>1</sup> United States Environmental Protection Agency. 2015 Toxic Release Inventory, released March 2017, available on the worldwide web at <a href="https://iaspub.epa.gov/triexplorer/tri\_release.chemical">https://iaspub.epa.gov/triexplorer/tri\_release.chemical</a>.

No additional monitors were required to comply with the population weighted emission index, PWEI, monitoring requirements because the total sulfur dioxide emissions in this MSA multiplied by the total MSA population does not result in a high enough index to require monitoring. This area will also not operate any near-road **carbon monoxide** and **fine particle** monitors because the population is under one million.

#### (2) Cleveland County - Shelby Micropolitan Statistical Area

Cleveland County is part of the Charlotte-Concord combined statistical area. The micropolitan statistical area (miSA) of Shelby is in the county. DAQ currently does not operate any monitors in Cleveland County. The December 2010 revisions to the **lead monitoring** network regulations did not result in additional monitoring in Cleveland County. This county is not required to add ozone monitors because the area does not have any MSAs that must meet the minimum number of monitors required by 40 CFR Part 58, Appendix D for population exposure monitoring in urban areas. Cleveland County is too small to require area-wide nitrogen dioxide monitors or near roadway monitoring for nitrogen dioxide, carbon monoxide and fine particles. The 2010 **sulfur dioxide** monitoring requirements also did not result in additional monitoring in this area because there are no large sources of sulfur dioxide in this county. This county is also not required to monitor for **carbon monoxide** because the population is too small to require near road carbon monoxide monitoring.

#### (3) Charlotte-Gastonia-Concord MSA

The Charlotte-Gastonia-Concord MSA consists of 11 counties: Anson, Cabarrus, Gaston, Iredell, Lincoln, Mecklenburg, Rowan and Union in North Carolina and Chester, Lancaster and York in South Carolina. The major urban areas are Charlotte, Gastonia and Concord in North Carolina and Rock Hill in South Carolina. This MSA is one of the fastest growing areas in North Carolina. Currently, DAQ operates three monitoring sites in the Charlotte-Gastonia-Concord MSA, Mecklenburg County Air Quality, MCAQ, operates five, the South Carolina Department of Health and Environmental Conservation, DHEC, operates one, and the Catawba Indian Nation operates one. These sites are located at Crouse in Lincoln County, Friendship Park, Ramblewood Park, Remount Road, Garinger High School and University Meadows in Charlotte in Mecklenburg County, Rockwell in Rowan County, Monroe in Union County, York and Avenue of the Nations in York County, South Carolina. MCAQ shut down the Montclaire site on April 1, 2019 after receiving a notice that Charlotte-Mecklenburg Schools would evict them in mid-April. MCAQ moved the fine particle monitor to Friendship Park and the PM<sub>10</sub> monitor to Ramblewood Park in late 2019. Figure C28 displays the locations of these monitors.

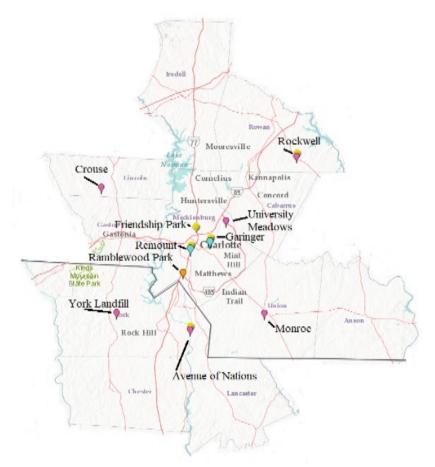


Figure C28. Monitoring sites in the Charlotte-Concord-Gastonia MSA

DAQ shut down the **Enochville** seasonal ozone monitor in Rowan County at the end of the 2013 ozone season and the Grier Middle School fine-particle monitoring site in Gaston County in February 2015. At the end of the 2014 ozone season, the property owner evicted MCAQ from the Arrowood site in Mecklenburg County and at the end of the 2015 ozone season, the property owner evicted MCAQ from the County Line site. Mecklenburg County Air Quality established the University Meadows site on April 1, 2016, to replace the County Line site.

MCAQ also shut down the Fire Station #11 PM10 site on June 29, 2016, due to issues at the site, and the Oakdale fine-particle monitoring site at the end of 2016, so MCAQ could move the monitor to the Remount Road near-road site. DAQ shut down the **Grier Middle School** site on Feb. 25, 2015. The NAAQS and AQI monitors were not required by 40 CFR Part 58, Appendix D. DAQ no longer needed the continuous monitor at the site for air quality forecasting and because of the lower fine particle concentrations throughout the state, the monitors were no longer needed to ensure an adequate fine particle network.

On February 13, 2019, Metric Construction, a construction contractor working for Charlotte-Mecklenburg Schools, notified MCAQ that they would need to remove their Montclaire air monitoring station from the premises of Montclaire Elementary School to make way for

construction of a new school building on the property. Metric Construction commenced construction around May 1, 2019. Pre-construction work at the site required removal of power from the monitoring station as early as mid to late April, 2019. Thus, MCAQ terminated monitoring at the Montclaire air monitoring station on April 1, 2019.

Appendix B to Volume 1 discusses the MCAQ sites and monitors. Only the three DAQ sites (Crouse in Lincoln County, Rockwell in Rowan County and Monroe in Union County) are further discussed in this subsection.

At the **Crouse** site in Lincoln County, DAQ operates a seasonal ozone monitor. Figure C29 shows the site. Table C4 summarizes monitoring information for the site. Figure C30 through Figure C37 provides views looking north, northeast, east, southeast, south, southwest, west and northwest. The division established the site in 1993 as the secondary downwind site for the Charlotte-Concord-Gastonia MSA. Today, it provides valuable information on ozone concentrations in Lincoln County, which DAQ may use to keep parts of the county from receiving a nonattainment designation for the ozone standard.



Figure C29. Crouse ozone monitoring site

#### **Table C4. Site Table for Crouse**

Tuble Circ	Site Tuble for Crouse												
Site Name:	Crouse		<b>AQS Site Identi</b>	ification Number	37-109-0004								
Location:	1487 Riverview Road	487 Riverview Road, Lincolnton, North Carolina											
CBSA:	Charlotte-Gasto	onia-Concord, NC	C-SC	CBSA #:	16740								
Latitude	35.438556	Longitude	-81.276750	Datum:	WGS84								
Elevation	270 meters												

**Table C4. Site Table for Crouse** 

Parameter Name	Method	Method	Refe	erence ID	Samp	le Duratio	n S	ampling Schedule	
	Instrumental with u	ltra							
Ozone	violet photometry, (	047	EQOA-0	880-	047	1-Hou	r	N	March 1 to Oct. 31
Date Monitor Estab							Jı	uly 1, 1993	
Nearest Road:	Riverview Road	Traffi	ic Count:	22	200	Y	ear of Cou	ınt:	2015
Parameter Name	Distance to Road	Direc	ction to Ro	ad	Monitor T	ype	Statemen	t of I	Purpose
							Complian	ce w/	NAAQS. Real-time
Ozone	62 meters	5	Southwest		SLAMS		AQI report		& forecasting.
			Suitable		ble for Com	parisor	1		
Parameter Name	Monitoring Object	tive	Scale to NAAQS			5	Propos	sal to	Move or Change
Ozone	General background	d	Urban		Yes		None		
			Meets Ro	quir	ements of 4	0 CFR	Part 58		
Parameter Name	Appendix A		Appendix C		Ap	opendix D			Appendix E
Ozone	Yes		Yes			Yes			Yes
Parameter Name	Probe Height (m)	Di	istance to S	upp	ort	t Distance to Tree		ees	Obstacles
Ozone	3.5		1.3	1.3 meter		>20 meters			None



Figure C30. Looking north from the Crouse site



Figure C31. Looking northwest from the Crouse site



Figure C32. Looking northeast from the Crouse site



Figure C33. Looking east from the Crouse site



Figure C34. Looking west from the Crouse site



Figure C35. Looking southwest from the Crouse site



Figure C36. Looking southeast from the Crouse site



Figure C37. Looking south from the Crouse site

At **Rockwell,** DAQ operates a year-round ozone monitor and a continuous fine particle monitor. On March 12, 2019, the division added a rainwater collection sampler to the site. DAQ shut down the continuous fine-particle nitrate monitor and aethalometer as well as a reactive-oxides-of-nitrogen monitor that operated year-round at this site in 2016. DAQ operated these monitors to provide information for planning purposes and to evaluate state regulations. Title 40 CFR Part 58, Appendix D or any other EPA regulations did not require these monitors. DAQ made the decision to shut down these monitors based on staffing considerations, the age of the equipment and the decision that the division did not need the additional data provided by these monitors for planning purposes. DAQ shut down the aethalometer on Aug. 8, 2016 (because the monitor was broken and removed from service), the reactive oxides of nitrogen monitor on Nov. 3, 2016, and the nitrate monitor on Nov. 4, 2016.

DAQ shut down the one-in-three-day fine particle FRM monitor, one-in-six day collocated fine particle monitor and continuous fine particle monitor at the end of 2015. The division shut down the one-in-six-day speciation fine particle monitors in January 2015 because the EPA stopped

funding the sample analysis for them. On Oct. 24, 2019, the DAQ resumed fine particle monitoring at the site to provide background data for PSD modeling.

In October 2020, DAQ added a nitrogen dioxide monitor to the site. Table C5 summarizes monitoring information for the site. Figure C38 through Figure C46 provide pictures of the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest.

**Table C5. Site Table for Rockwell** 

Appendix	Site Name:	101 1	ROCK	Rocky	vell	409	S Site 1	den	tification	Numbe	r 37	7-159-0	021
CBSA;											3 /	7-137-0	021
Date   Date   Monitor Established:   Gold Hill Road   Traffic Count:   Gold Cone   G		Charle	otte-Ga								16	5740	
Parameter Name													
Distance				Longituu	C	-00.5	73037		Datum.		, ,,	GDOT	
Ozone	Parameter Name	Metho	od							e ID			
Conditions, BAM 1022   VSCC	Ozone		mental	l with ultra v	iolet p	hoton	netry,	E	EOOA-0880-047			ur	Year-round
Conditions, BAM 1022   VSCC	PM 2.5 local	Met O	ne BA	M-1022 Ma	ass Mo	nitor v	w/						
Teledyne Advanced Pollution   Instrumentation, Model T500U cavity attenuated phase shift spectroscopy   Nitrogen Dioxide Analyzer Automated   EQNA-0514-212   1-Hour   Year Round	conditions, BAM 1022							I	EQPM-10	13-209	1-Ho	ur	Year Round
Date Monitor Established:       PM 2.5 local conditions, BAM 1022       Oct. 24, 2019         Nearest Road:       Gold Hill Road       Year of Count:       2016         Parameter Name       Distance to Road       Direction to Road       Worth Special purpose       Statement of Purpose         Ozone       17 meters       North       Special purpose       Compliance w/NAAQS. Modeling.         PM 2.5 local conditions, BAM 1022       18 meters       North       Special purpose       Compliance w/NAAQS. Modeling.         Nitrogen dioxide, CAPS       17 meters       North       Special purpose       PSD modeling/permitting         Parameter Name       Monitoring Objective       Scale       Suitable to Compare to NAAQS       Move or Change         Ozone       Highest concentration       Urban       Yes       None         PM 2.5 local conditions, BAM 1022       Population Exposure       Neighborhood       Yes       None         Nitrogen dioxide, CAPS       General Background       Yes       None         Parameter Name       Appendix A       Appendix C       Appendix D       Appendix E         Ozone       Yes       Yes       Yes – the monitor is not required       Yes         PM 2.5 local conditions, BAM 1022 <th>Nitrogen dioxide, CAPS</th> <th>Instrui</th> <th colspan="6">nstrumentation, Model T500U cavity stenuated phase shift spectroscopy</th> <th></th>	Nitrogen dioxide, CAPS	Instrui	nstrumentation, Model T500U cavity stenuated phase shift spectroscopy										
Nitrogen dioxide, CAPS         Oct. 22, 2020           Nearest Road:         Gold Hill Road         Year of Count:         2016           Parameter Name         Distance to Road to Road to Road         Wonitor Type         Statement of Purpose           Ozone         17 meters         North         Special purpose         Ozone precursor monitoring. Compliance w/NAAQS. Modeling.           PM 2.5 local conditions, BAM 1022         18 meters         North         Special purpose         Compliance w/NAAQS. Modeling.           Nitrogen dioxide, CAPS         17 meters         North         Special purpose         Compliance w/NAAQS. Modeling.           Parameter Name         Monitoring Objective         Scale         Suitable to Compare to NAAQS         Proposal to Move or Change           Ozone         Highest concentration         Urban         Yes         None           PM 2.5 local conditions, BAM 1022         Population Exposure Neighborhood         Yes         None           Nitrogen dioxide, CAPS         General Background         Yes         None           PM 2.5 local conditions, BAM 1022         Yes         Yes         Yes - the monitor is not required         Yes           PM 2.5 local conditions, BAM 1022         Yes         Yes         Yes - the monitor is not required         Yes		L											
Nearest Road:   Gold Hill Road   Traffic Count:   Gold Hill Road   Gold Hill Road   Traffic Count:   Gold Hill Road   Gold Hill Road   Traffic Count:   Gold Hill Road   Gold Hill Road   To Road   Gold Hill Road   To Road   Gold Hill Road   Go	<b>Date Monitor Establish</b>						1 1022						
Parameter Name   Distance to Road   Direction to Road   Monitor Type   Statement of Purpose			Nitrog	gen dioxide, CAPS Oct. 22, 2020							2, 2020		
Distance to Road   Direction to Road   Nonitor Type   Statement of Purpose	Nearest Road:			d Hill Road									
Parameter Name       to Road       to Road       Monitor Type       Statement of Purpose         Ozone       17 meters       North       Special purpose       Ozone precursor monitoring. Compliance w/NAAQS. Modeling.         PM 2.5 local conditions, BAM 1022       18 meters       North       Special purpose       Compliance w/NAAQS. Modeling.         Nitrogen dioxide, CAPS       17 meters       North       Special purpose       PSD modeling/permitting         Monitoring Objective       Scale       Suitable to Compare to NAAQS       Proposal to Move or Change         Ozone       Highest concentration       Urban       Yes       None         PM 2.5 local conditions, BAM 1022       Population Exposure       Neighborhood       Yes       None         Nitrogen dioxide, CAPS       General Background       Yes       None         Parameter Name       Appendix A Appendix C Sequirements for:         Ozone       Yes       Yes       Yes – the monitor is not required       Yes         PM 2.5 local conditions, BAM 1022       Yes       Yes       Yes – the monitor is not required       Yes         Nitrogen dioxide, CAPS       Yes       Yes       Yes – the monitor is not required       Yes         PM 2.5 local conditions, BAM 1022       Yes       Yes       Yes – the monitor is not requ	Traffic Count:	610				Ŋ	<i>l</i> ear	of Coun	t:	2	016		
Ozone 17 meters North Special purpose Compliance w/NAAQS. Modeling.  PM 2.5 local conditions, BAM 1022 18 meters North Special purpose Compliance w/NAAQS. Modeling.  North Special purpose Compliance w/NAAQS. Modeling.  PSD modeling/permitting  Monitoring Objective Scale to NAAQS Move or Change to NAAQS Move or Change  Ozone Highest concentration Urban Yes None  PM 2.5 local conditions, BAM 1022 Permitting North Special purpose PSD modeling/permitting  Move or Change North Special purpose PSD modeling/permitting  Suitable to Compare to NAAQS Move or Change North NAAQS Move or Change North NAAQS North Special purpose PSD modeling/permitting  Move or Change North Special purpose PSD modeling/permitting  Suitable to Compare to NAAQS North Special purpose PSD modeling/permitting  North Special purpose Compliance w/NAAQS Modeling.  PSD modeling/permitting  Suitable to Compare to NAAQS Move or Change North NAAQS Move or Change North NAAQS North North Special purpose PSD modeling/permitting  North Special purpose Compliance w/NAAQS Modeling.  PSD modeling/permitting  Suitable to Compare to NAAQS Move or Change North NAAQS Move or Change North NAAQS Move or Change North North NAAQS Move or Change North NAAQS Move or Change North North NAAQS Move or Change North North NAAQS Move or Change North NAAQS Move				Distance	Dire	ction							
Ozone 17 meters North Special purpose Compliance w/NAAQS. Modeling.  PM 2.5 local conditions, BAM 1022 18 meters North Special purpose Compliance w/NAAQS. Modeling.  Ritrogen dioxide, CAPS 17 meters North Special purpose PSD modeling/permitting  Monitoring Objective Scale to NAAQS Move or Change  Ozone Highest concentration Urban Yes None  PM 2.5 local conditions, BAM 1022 Population Exposure Neighborhood Yes None  Meets 40 CFR Part 58 Requirements for:  Appendix A Appendix C Appendix D Appendix E  Ozone Yes Yes Yes He monitor is not required Yes Yes Nitrogen dioxide, CAPS Yes Yes - the monitor is not required Yes Nitrogen dioxide, CAPS Yes Yes - the monitor is not required Yes Nitrogen dioxide, CAPS Yes Yes Yes - the monitor is not required Yes Nitrogen dioxide, CAPS Yes Yes Yes - the monitor is not required Yes Nitrogen dioxide, CAPS Yes Yes Yes - the monitor is not required Yes Parameter Name Probe Height (m) Distance to Support Distance to Trees Obstacles  Ozone 3.5 1.1 meters > 20 meters None  PM 2.5 local conditions, BAM 1022 2.4 2.1 meters > 20 meters None	Parameter Name			to Road	to Ro	oad	Moi	iitor	Type	Statem	ent of	Purpos	se
18 meters   North   Special purpose   Compliance w/NAAQS. Modeling.	Ozone			17 meters	No	orth	Spec	cial p	ourpose				
Nitrogen dioxide, CAPS    North   Special purpose   PSD modeling/permitting	PM 2.5 local conditions, 1022	BAM		18 meters	No	North Specia		cial p	ourpose	Compli	ance w	//NAA(	QS. Modeling.
Monitoring Objective   Scale   to NAAQS   Move or Change	Nitrogen dioxide, CAPS			17 meters	No	orth	Spec	cial p	ourpose	PSD mo	odeling	g/permi	tting
Parameter NameObjectiveScaleto NAAQSMove or ChangeOzoneHighest concentrationUrbanYesNonePM 2.5 local conditions, BAM 1022Population ExposureNeighborhoodYesNoneNitrogen dioxide, CAPSGeneral BackgroundYesNoneMeets 40 CFR Part 58 Requirements for:Parameter NameAppendix AAppendix CAppendix DAppendix EOzoneYesYesYes – the monitor is not requiredYesPM 2.5 local conditions, BAM 1022YesYesYes – the monitor is not requiredYesNitrogen dioxide, CAPSYesYesYes – the monitor is not requiredYesParameter NameProbe Height (m)Distance to SupportDistance to TreesObstaclesOzone3.51.1 meters> 20 metersNonePM 2.5 local conditions, BAM 10222.42.1 meters> 20 metersNone			Mon	itoring					Suitab	ole to Co	mpare	Pro	posal to
PM 2.5 local conditions, BAM 1022 Parameter Name Ozone PM 2.5 local conditions, BAM 1022 Parameter Name Ozone Parameter Name Ozone Physical conditions, BAM 1022 Parameter Name Ozone Physical conditions, BAM 1022 Parameter Name Ozone Physical conditions, BAM 1022 Parameter Name Ozone Parameter Name Ozone O	Parameter Name					Scal							
PM 2.5 local conditions, BAM 1022 Parameter Name Ozone PM 2.5 local conditions, BAM 1022 Parameter Name Ozone Parameter Name Ozone Physical conditions, BAM 1022 Parameter Name Ozone Physical conditions, BAM 1022 Parameter Name Ozone Physical conditions, BAM 1022 Parameter Name Ozone Parameter Name Ozone O	Ozone		High	nest concenti	ation	Urba	an			Yes		Noı	ne
Meets 40 CFR Part 58 Requirements for:Parameter NameAppendix AAppendix CAppendix DAppendix EOzoneYesYesYes - the monitor is not requiredYesPM 2.5 local conditions, BAM 1022YesYesYes - the monitor is not requiredYesNitrogen dioxide, CAPSYesYesYes - the monitor is not requiredYesParameter NameProbe Height (m)Distance to SupportDistance to TreesObstaclesOzone3.51.1 meters> 20 metersNonePM 2.5 local conditions, BAM 10222.42.1 meters> 20 metersNone	PM 2.5 local conditions, 1022	BAM				Neig	ghborh	ood		Yes		Noi	ne
Meets 40 CFR Part 58 Requirements for:Parameter NameAppendix AAppendix CAppendix DAppendix EOzoneYesYesYes - the monitor is not requiredYesPM 2.5 local conditions, BAM 1022YesYesYes - the monitor is not requiredYesNitrogen dioxide, CAPSYesYesYes - the monitor is not requiredYesParameter NameProbe Height (m)Distance to SupportDistance to TreesObstaclesOzone3.51.1 meters> 20 metersNonePM 2.5 local conditions, BAM 10222.42.1 meters> 20 metersNone	Nitrogen dioxide, CAPS		Gene	eral Backgro	und					Yes		Noı	ne
Parameter NameAppendix AAppendix CAppendix DAppendix EOzoneYesYesYes – the monitor is not requiredYesPM 2.5 local conditions, BAM 1022YesYesYes – the monitor is not requiredYesNitrogen dioxide, CAPSYesYesYes – the monitor is not requiredYesParameter NameProbe Height (m)Distance to SupportDistance to TreesObstaclesOzone3.51.1 meters> 20 metersNonePM 2.5 local conditions, BAM 10222.42.1 meters> 20 metersNone	-					Mee	ts 40 C	FR I	Part 58 I	Requiren	nents f	for:	
OzoneYesYesYes - the monitor is not requiredYesPM 2.5 local conditions, BAM 1022YesYesYes - the monitor is not requiredYesNitrogen dioxide, CAPSYesYesYes - the monitor is not requiredYesParameter NameProbe Height (m)Distance to SupportDistance to TreesObstaclesOzone3.51.1 meters> 20 metersNonePM 2.5 local conditions, BAM 10222.42.1 meters> 20 metersNone	Parameter Name			Appendix	A A								Appendix E
PM 2.5 local conditions, BAM 1022 Yes Yes Yes—the monitor is not required Yes Nitrogen dioxide, CAPS Yes Yes—the monitor is not required Yes  Parameter Name Probe Height (m) Distance to Support Distance to Trees Obstacles Ozone 3.5 1.1 meters > 20 meters None  PM 2.5 local conditions, BAM 1022 2.4 2.1 meters > 20 meters None	Ozone							Ye				uired	
Nitrogen dioxide, CAPSYesYesYes – the monitor is not requiredYesParameter NameProbe Height (m)Distance to SupportDistance to TreesObstaclesOzone3.51.1 meters> 20 metersNonePM 2.5 local conditions, BAM 10222.42.1 meters> 20 metersNone	PM 2.5 local conditions.	022											
Parameter NameProbe Height (m)Distance to SupportDistance to TreesObstaclesOzone3.51.1 meters> 20 metersNonePM 2.5 local conditions, BAM 10222.42.1 meters> 20 metersNone													
Ozone3.51.1 meters> 20 metersNonePM 2.5 local conditions, BAM 10222.42.1 meters> 20 metersNone					eight (							1	
PM 2.5 local conditions, BAM 1022 2.4 2.1 meters > 20 meters None													
	Nitrogen dioxide, CAPS											None	



Figure C38. The Rockwell ozone and fine particle site, 37-159-0021



Figure C39. Looking north from the Rockwell site



Figure C40. Rockwell site looking northwest



Figure C41. Looking northeast from the Rockwell site



Figure C42. Looking east from the Rockwell site



Figure C43. Looking west from the Rockwell site



Figure C44. Looking southwest from the Rockwell



Figure C45. Looking southeast from the Rockwell site



Figure C46. Looking south from the Rockwell site

At the **Monroe Middle School** site, DAQ operates a seasonal ozone monitor. Figure C47 shows the site. Table C6 summarizes monitoring information for the site. Figure C48 through Figure C51 provide views looking north, east, south and west. This ozone-monitoring site is one of seven for the MSA. Title 40 CFR Part 58, Appendix D requires the Charlotte-Gastonia-Concord MSA to have two ozone monitoring sites. The site is located at the goal end of a soccer field, so soccer balls sometimes damage the probe. DAQ has investigated moving the site to another part of Monroe; however, this site meets the siting criteria in 40 CFR Part 58, Appendix E better than any nearby alternative location. DAQ has also added a fence on the roof of the building between the probe and soccer field to protect the probe. The DAQ is adding meteorological sensors and a continuous fine particle monitor to the site during 2021.



Figure C47. Monroe ozone monitoring site, 37-179-0003



Figure C48. Looking north from the Monroe site



Figure C49. Looking east from the Monroe site



Figure C50. Looking west from the Monroe site



Figure C51. Looking south from the Monroe site

#### Table C6. Site Table for Monroe Middle School

Table Co	. Sitt I	able for Midiffo	CIVIIUU	ne Seno	101					
Site Name:	Monro	e Middle School			AQS Sit	te Identi	fication	Number	37-1	79-0003
<b>Location:</b>	701 Cha	rles Street, Monro	e, North	Carolina						
CBSA:	Charlott	e-Gastonia-Concor	d, NC-S	С			CBSA #	:	16740	
Latitude	34.9738	89 Longitude	-80.540	)833		]	Datum:		WG	S84
Elevation		184 meters								
Parameter	Name	Method		Method	d Refere	nce ID	Samp	le Duration	Sar	npling Schedule
		Instrumental wit	h ultra							
Ozone		violet photometr	y, 047	EQOA-	-0880-04	7	1-Hou	r	Ma	rch 1 to Oct. 31
Date Monitor Established: Ozone A									April	7, 1999
Nearest Ro	ad:	Charles Street		Traffic Count:			700 Year of Cou			2017
Parameter Name Distance to Road		Dire	Direction to Road Monito			Type	Statement	of Pu	rpose	
				Specia				Compliance	e w/N	AAQS. Real-time
Ozone		71.3 meters		-			Purpose AQI report			forecasting.
Parameter		Monitoring			,	Suitable	for			
Name		Objective	Sc	eale	Comp	arison to	NAA(	S Proposa	al to I	Move or Change
Ozone	Po	oulation Exposure	Neight	orhood		Yes		None		<u> </u>
	•	Meets Part 58,	Me	eets Part	58,			•		Meets Part 58,
		Appendix A	Ar	pendix (	C ĺ	Meets	Part 5	8, Appendix	D	Appendix E
Parameter	Name	Requirements		quireme			irement			Requirements
Ozone		Yes		Yes			<u> </u>	l'es		Yes
Parameter	Name	Probe Height (m)	) Di	stance to	Suppor	t	Dis	tance to Tre	es	Obstacles
Ozone		3.9		1	**			>20 meters		None
							-			

DAQ continues to operate the Monroe site because it provides valuable information for developing nonattainment boundaries and the division has used the data from this site in the past

to keep the EPA from designating parts of Union County as being in nonattainment with the ozone standard.

Changes to the **lead monitoring** requirements in 2010 resulted in additional monitoring in the Charlotte-Gastonia-Concord MSA. This MSA has an NCore monitoring site. Monitoring for lead in the ambient air at that site began Dec. 27, 2011. This lead monitoring ended on April 30, 2016, when new monitoring regulations became effective.<sup>2</sup>

The 2015 **ozone monitoring** requirements did not result in additional monitoring in the Charlotte-Gastonia-Concord MSA. The MSA currently exceeds the minimum number of monitors required by 40 CFR Part 58, Appendix D for population exposure monitoring in urban areas. Beginning in 2017, seasonal ozone monitoring starts on March 1 instead of April 1.

The 2010 **nitrogen dioxide** monitoring requirements required additional monitoring in the Charlotte-Gastonia-Concord MSA. The MSA was required to have an area-wide monitor starting in 2013 and a near-roadway monitor starting in 2014. In 2017, the population estimates for the Charlotte-Gastonia-Concord MSA exceeded 2.5 million, requiring the need for a second near-road monitoring station. MCAQ plans to install a second near-road station whenever the EPA provides the funding to do so.

The 2010 **sulfur dioxide** monitoring requirements also required additional monitoring in the Charlotte-Gastonia-Concord MSA. Originally, the EPA required this MSA to have two population-weighted emission index, or PWEI, monitors within the MSA because the MSA had large sources of sulfur dioxide as well as large numbers of people. These PWEI monitors were located at the Garinger High School monitoring site in Charlotte and at the York monitoring site in York, South Carolina. However, a decline in sulfur dioxide emissions resulted in only one PWEI monitor being required. Thus, the York sulfur dioxide monitor shut down in June 2014. However, when South Carolina moved the York site, sulfur dioxide monitoring resumed in York County.

The changes in the **carbon monoxide monitoring** requirements also resulted in more monitoring in this MSA. Because the population in the MSA is over one million people, a near-road carbon monoxide monitor started operating at Remount Road in 2017.

#### (4) Stanly County – Albemarle Micropolitan Statistical Area

Stanly County is part of the Charlotte-Concord combined statistical area. The Albemarle MiSA is in Stanly County. DAQ does not operate any monitoring sites in this county.

The expansion of the **lead monitoring** network to support the lower lead NAAQS did not result in monitoring in Stanly County. The 2015 **ozone monitoring** requirements also did not result in

<sup>&</sup>lt;sup>2</sup> Revisions to Ambient Monitoring Quality Assurance and Other Requirements, Federal Register, Vol. 81, No. 59, Monday, March 28, 2016, available on the worldwide web at <a href="https://www.gpo.gov/fdsys/pkg/FR-2016-03-28/pdf/2016-06226.pdf">https://www.gpo.gov/fdsys/pkg/FR-2016-03-28/pdf/2016-06226.pdf</a>.

more monitoring in this area. This area does not have any MSAs requiring a minimum number of monitors by 40 CFR Part 58, Appendix D for population exposure monitoring in urban areas.

The 2010 **nitrogen dioxide** monitoring requirements did not result in additional monitoring in Stanly County. The area is too small to require area-wide monitors or near-roadway monitoring. The 2010 **sulfur dioxide** monitoring requirements did not require any additional monitoring in this area because the population and sulfur dioxide emissions do not exceed the required threshold for monitoring. The 2011 changes to the **carbon monoxide monitoring** requirements also did not require additional monitors in this area because the population is too small.

# **Appendix C.1 Annual Network Site Review Forms for 2020**

Taylorsville-Liledoun

Lenoir

Hickory

Crouse

Rockwell

Monroe Middle School in Monroe

#### **Site Information**

Region_MRO	Site Na	ame <u>Taylors</u>	sville Liledo							
Street Address-148	7 Riverviev	v Road			City Line	<u>colnton</u>				
Urban Area Not	in an Urban	Area	Core-bas	ed Stat	istical Area	ı Hickor	y-Lenoir	-Morgantor	ı, NC	
	Enter E	Exact								
Latitude <u>35.</u>	<u>9138</u>	Longitud		1910			d of Mea			
In Decimal Degrees		In Decima			Other (ex	plain) Ex	planatio	on: NCDO	T Maps	
Elevation Above/be							<u>354.00</u>			
Name of nearest roa	d to inlet pro	obe <u>Liledou</u>	un Road	ADT	<u>6400</u> Yea	r latest ava	ilable 2	<u> 2019</u>		
Distance of ozone p	robe to near	est traffic la	ne (m) <u>220</u>	Direction	on from ozo	ne probe to	nearest	traffic lane	<u>SW</u>	
Comments: None.										
Name of nearest ma		•								
Distance of site to n	earest major	road (m)	525.00 Dire	ction fr	om site to n	earest majo	r road	$\underline{\text{SW}}$		
Comments: None.										
Site located near electrical substation/high voltage power lines?  Yes No										
Distance of site to nearest railroad										
track				1.	(m) <u>2</u>			to RR NE	□NA	
**OPTIONAL** D			<del></del>				(m)		ection	
Distance between site and drip line of water tower (m) Direction from site to water tower NA Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks,										
construction activities						storage, sta	cks, ven	ts, rainoad	racks,	
construction activity	cs, 1ast 100u	restaurants	, and swiffi	iiiig po	OIS.					
<u>t</u>										
ANSWER ALL APP	LICABLE (	QUESTIONS	S:							
Parameters	Monit	toring Obj	ective		Scale			Site Type	•	
$\bigcirc$ O <sub>3</sub>	Genera	l/Backgrou	ınd	ШМі	cro		⊠SL <i>A</i>	MS		
		t Concentra						IIVIO		
		3 Concentr		ШМі	ddle			1		
		tion Expos	ure	□Ne	ighborhoo	d				
	☐ Source ☐ Transpe	Oriented		⊠Url	oan					
		d Backgrou	ınd	□ъ。	oi amal					
		e Related I		ке	gional					
Probe inlet height	(from groun	nd) 2-15 m	? Yes 🛚	No						
Give actual measured height from ground (meters) 3.65										
Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting										
structure > 1 m? Yes \( \sum \) No \( \subseteq \)										
Actual measured distance from outer edge of probe to supporting structure (meters) 1.06										
Is probe > 20 m fro				Yes 🔀		answer *				
*Is probe > 10 m from	the nearest t	ree drip line?			*Number of	f trees within	10 meter	rs		
*Distance from probe			Direction f				of tree abo	ove probe (m	ı)	
Are there any obst	acles to air	flow? *Ye	es 🔲 (ansv	ver *'d	questions)	No 🔀				
*Identify obstacle Distance from probe inlet (m)Direction from probe inlet to obstacle No										

RECOMMENDATIONS:
1) Maintain current site status? Yes ⊠ *No □ (answer *'d questions)
*2) Change monitoring objective? Yes [ (enter new objective:) No [
*3) Change scale of representativeness? Yes [ (enter new scale: ) No [
*4) Relocate site? Yes \( \subseteq \text{No} \subseteq \)
Comments: None.
Date of Last Site Pictures: December 17, 2021 New Pictures Submitted? Yes No
Reviewer PJCDate: January 8, 2021
Ambient Monitoring Coordinator PJC Date: 1/8/2021

#### **Instructions:**

**Trees**: The probe or inlet must be at least 10 meters or further from the drip line of trees. A distance of at least 20 meters between the probe and any tree or trees is preferred.

Obstacles: An obstacle is anything that restricts air flow. A tree can be an obstacle because it has branches and leaves that restrict the flow of air but a pole is not considered to be an obstacle. To avoid interference from obstacles, the probe or inlet must have unrestricted airflow and be located away from obstacles. The distance from the obstacle to the probe or inlet must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path.

If the annual network review has indicated that the monitoring objectives and scale of representativeness for the site have not changed and the siting criteria still meets those monitoring objectives and that scale of representativeness and there are no other reasons to modify the site in any way, check "Yes" to the question "Maintain current site status?" and skip the rest of the recommendations section.

If the annual network review has indicated that the monitoring objectives, scale of representativeness, or siting criteria have changed for some reason or there is another reason to modify the site in some way, check "No" to the question "Maintain current site status?" and complete the rest of the recommendations section. If the monitoring objective or scale of representativeness needs to be changed, check the "Yes" box and write in the new monitoring objective or scale of representativeness on the line. Otherwise check the "No" box. If the site needs to be relocated, check the "Yes" box. If the site needs to be shut down, write "Shut down" in the comments line. Also, use the comments line to explain any change requested.

Check the site picture archive to find out when the last set of site pictures were taken and write the date down on the line. If the pictures are more than five years old or if something at the site has changed in the past year, take new site pictures. Changes that require new site pictures include additions, removals, or movement of monitors at the site, growth or removal of trees and other shrubs at the site, and construction of roads or buildings at or in the vicinity of the site.

Pictures of the site should at a minimum include at least one picture showing the site itself and pictures standing at the probe or inlet or as close as possible to the probe or inlet looking in the four compass directions (north, east, south, and west). If meteorological data are collected at the site, pictures standing at the meteorological tower looking southwest and northeast should also be included. Sometimes pictures looking at the site from the four compass directions are also helpful.

Be sure to correctly identify the pictures as to which compass direction they show. This documentation may be achieved by using good notes when taking the pictures, holding a compass in front of the camera, or placing a sign with the appropriate direction indicated somewhere in the picture. Label the pictures with the name of the site using the two-digit logger ID (HC, JW, *etc.*), the direction (N, NE, E, SE, S, SW, W, NW), and the date taken (YYYYMMDD) and transfer the pictures to the group drive in the appropriate Incoming/Regional Office directory.

#### **Site Information**

Region_ARO Site Name Lenoir				73	QS Site # 37- <u>027</u> - <u>0003</u>	
Street Address-291 Nuway Circle			City Lenois			
Urban Area LEN				stical Area	Hickory-Lenoir-Morganton, NC	
	Enter Ex					
	1.5306	Longitude	<u>35.9359</u>		Method of Measuring	
In Decimal Degrees		In Decimal Degre	ees	Exp	lanation: Google Earth Pro	
Elevation Above/be					<u>372.00</u>	
Name of nearest roa					available 2018	
_	robe to nearest t	traffic lane (m) <u>146</u>	Direction fr	om ozone prol	be to nearest traffic lane $\underline{E}$	
Comments:						
Name of nearest ma						
Distance of site to n	earest major roa	nd (m) <u>146.00</u> Dir	ection from s	ite to nearest	najor road <u>E</u>	
Comments:						
Site located near ele			ver lines?		Yes No No	
Distance of site to n				(m) 1023	Direction to RR WSW	
**OPTIONAL** D					(m) Direction	
Distance between si						
construction activities				se bulk storage	, stacks, vents, railroad tracks,	
Construction activitie	es, last lood les	taurants, and Swiii	ning poors.			
		_				
ANSWER ALL APPLICABLE QUESTIONS:						
ANSWER ALL APP	LICABLE QUE	ESTIONS:				
Parameters		ing Objective		Scale	Site Type	
		ing Objective	1	Scale		
Parameters	Monitori ⊠General/Ba □Highest Co	ng Objective ackground oncentration	Micro		Site Type  ⊠SLAMS	
Parameters	Monitori  ⊠General/Ba  □Highest Ca  □Max O3 C	ackground oncentration	1			
Parameters	Monitori  General/B  Highest Co  Max O3 C  Population	ackground oncentration oncentration Exposure	Micro		⊠SLAMS	
Parameters	Monitori  General/B. Highest Co Max O3 C Population Source Ori	ackground oncentration oncentration Exposure	☐Micro		⊠SLAMS	
Parameters	Monitori  General/Ba Highest Co Max O3 C Population Source Ori Transport Upwind B	ing Objective ackground oncentration oncentration Exposure iented ackground	☐Micro ☐Middle ☐Neighb ☐Urban	orhood	⊠SLAMS	
Parameters  O <sub>3</sub>	Monitori General/Ba Highest Ca Max O3 Ca Population Source Ori Transport Upwind B Welfare R	ing Objective ackground oncentration oncentration Exposure iented ackground elated Impacts	☐Micro ☐Middle ☐Neighb ☐Urban ☐Region	orhood	⊠SLAMS	
Parameters O3 Probe inlet height	Monitori  General/Ba Highest Co Max O3 C Population Source Ori Transport Upwind B Welfare R (from ground)	ackground oncentration oncentration Exposure iented ackground elated Impacts 2-15 m? Yes	☐Micro ☐Middle ☐Neighb ☐Urban ☐Region	orhood	⊠SLAMS	
Probe inlet height Give actual measu	Monitori General/Ba General/Ba Highest Ca Max O3 Ca Population Source Ori Transport Upwind Ba Welfare Ra (from ground) red height from	ing Objective ackground oncentration oncentration a Exposure iented ackground elated Impacts 2-15 m? Yes 2 m ground (meters	☐Micro ☐Middle ☐Neighb ☐Urban ☐Region ☐ No ☐ 1.446	orhood al	⊠SLAMS □SPM	
Probe inlet height Give actual measu Distance of outer 6	Monitori General/Ba Highest Co Max O3 Co Population Source Ori Transport Upwind B Welfare R (from ground) red height from	ing Objective ackground oncentration oncentration a Exposure iented ackground elated Impacts 2-15 m? Yes 2 m ground (meters	☐Micro ☐Middle ☐Neighb ☐Urban ☐Region ☐ No ☐ 1.446	orhood al	⊠SLAMS □SPM	
Probe inlet height Give actual measu Distance of outer e structure > 1 m? Y	Monitori General/Ba Highest Co Max O3 C Population Source Ori Transport Upwind B Welfare R (from ground) red height from	ackground oncentration oncentration Exposure iented ackground elated Impacts 2-15 m? Yes a ground (meters inlet from horizon	☐Micro ☐Middle ☐Neighb ☐Urban ☐Region ☐ No ☐ ) 4.46 ntal (wall) an	orhood al nd/or vertical	SLAMS SPM (roof) supporting	
Probe inlet height Give actual measu Distance of outer 6	Monitori General/Ba Highest Co Max O3 C Population Source Ori Transport Upwind B Welfare R (from ground) red height from	ackground oncentration oncentration Exposure iented ackground elated Impacts 2-15 m? Yes a ground (meters onlet from horizon)	☐Micro ☐Middle ☐Neighb ☐Urban ☐Region ☐No ☐  4.46 ntal (wall) and the control of	orhood al nd/or vertical ting structure	SLAMS SPM  (roof) supporting  (meters) 1.60	
Probe inlet height Give actual measu Distance of outer e structure > 1 m? Y	Monitori General/Ba General/Ba Highest Co Max O3 Co Population Source Ori Transport Upwind B Welfare Ra (from ground) red height from edge of probe in test No Interpret to the color of th	ing Objective ackground oncentration oncentration a Exposure iented ackground elated Impacts 2-15 m? Yes 2 m ground (meters anlet from horizon	☐Micro ☐Middle ☐Neighb ☐Urban ☐Region ☐No ☐  4.46 ntal (wall) and the control of	orhood al nd/or vertical ting structure	SLAMS SPM (roof) supporting	
Probe inlet height Give actual measu Distance of outer e structure > 1 m? Y Actual measured d Is probe > 20 m from *Is probe > 10 m from	Monitori General/Ba Highest Co Max O3 C Population Source Ori Transport Upwind B Welfare R (from ground) red height from edge of probe in the nearest the nearest tree	ackground oncentration oncentration oncentration on Exposure iented ackground elated Impacts 2-15 m? Yes on ground (meters unlet from horizon outer edge of probote tree drip line?	Micro  Middle  Neighb  Urban  Region  4.46  ntal (wall) and the to support  Yes   *No □ *Nu	orhood  al  ad/or vertical  ting structure  No [] (answ	SLAMS  □SPM  (roof) supporting  (meters) 1.60  //er *'d questions)  ithin 10 meters	
Probe inlet height Give actual measu Distance of outer e structure > 1 m? Y Actual measured d Is probe > 20 m from *Is probe > 10 m from *Distance from probe	Monitori General/Ba Highest Co Max O3 Co Population Source Ori Transport Upwind B Welfare R (from ground) red height from edge of probe in the nearest tree of the learest tree of the closest tree (monitorial)	ackground oncentration oncentra	Micro  Middle  Neighb  Urban  Region  4.46  ntal (wall) and the to support  Yes   *No □ *Nu from probe to	orhood  al  ad/or vertical ting structure 'No [] (answ umber of trees w tree*Hei	SLAMS  □SPM  (roof) supporting  (meters) 1.60 //er *'d questions)  ithin 10 meters ght of tree above probe (m)	
Probe inlet height Give actual measu Distance of outer e structure > 1 m? Y Actual measured d Is probe > 20 m from *Is probe > 10 m from	Monitori General/Ba Highest Co Max O3 Co Population Source Ori Transport Upwind B Welfare R (from ground) red height from edge of probe in the nearest tree of the losest tree (monitorial)	ackground oncentration oncentra	Micro  Middle  Neighb  Urban  Region  4.46  ntal (wall) and the to support  Yes   *No □ *Nu from probe to	orhood  al  ad/or vertical ting structure 'No [] (answ umber of trees w tree*Hei	SLAMS  □SPM  (roof) supporting  (meters) 1.60 //er *'d questions)  ithin 10 meters ght of tree above probe (m)	

RECOMMENDATIONS:
1) Maintain current site status? Yes ⊠ *No □ (answer *'d questions)
*2) Change monitoring objective? Yes [ (enter new objective:) No [
*3) Change scale of representativeness? Yes [ (enter new scale: ) No [
*4) Relocate site? Yes No No
Comments:
Date of Last Site Pictures: September 10, 2018 New Pictures Submitted? Yes No
Reviewer <u>Terri Davis</u> <u>Date: November 2, 2020</u>
Ambient Monitoring Coordinator Steve Ensley Date: December 16, 2020

#### **Instructions:**

**Trees**: The probe or inlet must be at least 10 meters or further from the drip line of trees. A distance of at least 20 meters between the probe and any tree or trees is preferred.

Obstacles: An obstacle is anything that restricts air flow. A tree can be an obstacle because it has branches and leaves that restrict the flow of air but a pole is not considered to be an obstacle. To avoid interference from obstacles, the probe or inlet must have unrestricted airflow and be located away from obstacles. The distance from the obstacle to the probe or inlet must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path.

If the annual network review has indicated that the monitoring objectives and scale of representativeness for the site have not changed and the siting criteria still meets those monitoring objectives and that scale of representativeness and there are no other reasons to modify the site in any way, check "Yes" to the question "Maintain current site status?" and skip the rest of the recommendations section.

If the annual network review has indicated that the monitoring objectives, scale of representativeness, or siting criteria have changed for some reason or there is another reason to modify the site in some way, check "No" to the question "Maintain current site status?" and complete the rest of the recommendations section. If the monitoring objective or scale of representativeness needs to be changed, check the "Yes" box and write in the new monitoring objective or scale of representativeness on the line. Otherwise check the "No" box. If the site needs to be relocated, check the "Yes" box. If the site needs to be shut down, write "Shut down" in the comments line. Also, use the comments line to explain any change requested.

Check the site picture archive to find out when the last set of site pictures were taken and write the date down on the line. If the pictures are more than five years old or if something at the site has changed in the past year, take new site pictures. Changes that require new site pictures include additions, removals, or movement of monitors at the site, growth or removal of trees and other shrubs at the site, and construction of roads or buildings at or in the vicinity of the site.

Pictures of the site should at a minimum include at least one picture showing the site itself and pictures standing at the probe or inlet or as close as possible to the probe or inlet looking in the four compass directions (north, east, south, and west). If meteorological data are collected at the site, pictures standing at the meteorological tower looking southwest and northeast should also be included. Sometimes pictures looking at the site from the four compass directions are also helpful.

Be sure to correctly identify the pictures as to which compass direction they show. This documentation may be achieved by using good notes when taking the pictures, holding a compass in front of the camera, or placing a sign with the appropriate direction indicated somewhere in the picture. Label the pictures with the name of the site using the two-digit logger ID (HC, JW, etc.), the direction (N, NE, E, SE, S, SW, W, NW), and the date taken (YYYYMMDD) and transfer the pictures to the group drive in the appropriate Incoming/Regional Office directory.

#### **Site Information**

Region_MRO	Site Name Hickory			AQS S	Site # 37- <u>035</u>	- <u>0004</u>
Street Address-1st Ave. SW at 15th St. SW			City Hick	<u>ory</u>		
Urban Area HICKORY Core-based St			atistical Are	a Hickory-l	Lenoir-Morg	anton, NC
E	Enter Exact					
<b>Latitude</b> <u>35.729030</u>	Longitude	<u>-81.3657847</u>	Metl	od of Measur	ing: Google	Earth
In Decimal Degrees	Decimal Degrees In Decimal Degrees Matches			hes Web Map	: Yes 🛛	No 🗌
Elevation Above/below M	fean Sea Level (in me	eters) <u>348.0</u>	<u>00</u> <b>Met</b> l	od of Measur	ring: NCI	DOT Maps
Name of nearest road to in	nlet probe 2 <sup>nd</sup> Ave. S	W ADT	Latest availa	ble <u>3200</u> Year	latest availab	ole <u>2019</u>
Distance of PM inlet to ne	earest traffic lane (m)	22.6 Direction fi	om inlet to 1	nearest traffic l	ane SSW	
Comments: None.						
Name of nearest major roa	ad Dr. MLK Mem. I	Hwy. / HWY 321	ADT 39	9500 Year late	st available	<u>2019</u>
Distance of site to nearest	major road (m) 159	.10 Direction fro	m site to nea	rest major road	d <u>NE</u>	
Comments: None.						
Site located near electrical	l substation/high volta	age power lines?			Yes 🛛	No 🗌
Distance of site to nearest railroad track (m) 211 Direction to RR N NA						
**OPTIONAL** Distance of site to nearest power pole w/transformer (m) 33 Direction E						
Distance between site and	drip line of water tov	wer (m) 16.8 Dire	ection from s	site to water to	wer NW	
Explain any sources of po	tential bias; include c	ultivated fields, l	loose bulk st	orage, stacks, v	vents, railroa	d tracks,
construction activities, fas	st food restaurants, an	d swimming poo	ls.			
None noted.	_					

#### **Instructions:**

Address: Sometimes local addresses change. Confirm the local address of the site using a 911 locator or the address used by the local utility company, community or county to identify the site location.

Urban Area: If the monitor is located within the bounds of an urban area (an incorporated area with a population of 10,000 or more people), select the appropriate urban area from the list. Otherwise select "Not in an Urban Area".

Core-Based Statistical Area (CBSA): If the monitor is located in a county that belongs to a metropolitan statistical area (MSA) or a micropolitan statistical area (MiSA), then it is in a core-based statistical area. If the monitoring station is located in a county included in a MSA or MiSA, select the CBSA from the list. Otherwise select "None".

Longitude and Latitude: Determine the longitude and latitude using Google Earth. Report the longitude and latitude that matches up with the exact location of the monitoring shelter or monitor if no shelter is at the site. The longitude and latitude should be entered in decimal degrees. Use a conversion program, such as <a href="http://transition.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html">http://transition.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html</a>, to convert to decimal degrees if needed.

Road Information: For the nearest road to the inlet probe, list whatever roadway that carries vehicles closest to the

Road Information: For the nearest road to the inlet probe, list whatever roadway that carries vehicles closest to the probe, whether it is a named or public road and even if it has very little traffic. Use the comments space to describe the road or the source of the annual average daily traffic (AADT) counts. If the monitor is located near an unnamed, little used, private road, use the nearest major road space to list the closest named public road to the site. Include the distance and direction of the nearest major road from the site and the AADT if available. If the closest road is a small public road but there is a large major roadway such as an interstate highway, divided highway, major thoroughfare, etc., near the monitoring station use the nearest major road space to list the information about this major roadway. Include the distance and direction of the major road from the site and the AADT. The AADT for state roads can be obtained from the North Carolina Division of Transportation at

http://www.ncdot.gov/travel/statemapping/trafficvolumemaps/default.html. For AADT values for local roadways contact the appropriate local governments.

**Any Sources of Potential Bias**: Use this space to record information about the site that is not requested elsewhere. Especially note any changes that occurred near the site in the past year, such as road construction, building construction, new businesses, businesses closing, or changes in traffic patterns, crops or other agricultural activities.

Parameters	Monitoring Objective	Scale	Monitor Type
Air flow < 200 L/min	General/Background	☐Micro	SLAMS
☐ PM2.5 FRM ☐ PM10 Cont. (BAM)	Highest Concentration	☐Middle	□SPM
☐ PM10-2.5 FRM	□ Population Exposure	Neighborhood	☐ Nonregulatory
☐ PM10-2.5 BAM ☐ PM2.5 Cont. (BAM1020)	Source Oriented		Nonegulatory
MPM2.5 Cont. (BAM1022)	☐Transport	□Urban	
☐ PM2.5 Cont. (T640X)	☐Welfare Related Impacts	Regional	
	round)		
	from probe inlet to ground (met		
	probe inlet from horizontal (wal	ll) and/or vertical (pla	tform or roof)
supporting structure > 2 m			( , ) HCDAM
Actual measured distance 2.1, HCA BAM 2.1	from outer edge of probe inlet t	o supporting structure	(meters) HCBAM
	er edge of probe inlets of any lo	w volume monitor	
	e monitor at the site = 1 m or gre		Yes No NA
	onitors (Two FRMs, FRM & BA		(answer *'d questions)
& BAM) Located at Site?			No NA NA
	collocated PM 2.5 samplers (X)		No 🗌
4 m of each other?			ctual (meters): 2.13
other?	mpler inlets within 1 m vertical		tual (meters): 0
	onitor collocated with a PM2.5 i		(answer *'d questions)
at the site to measure PM			o NA
* Entire inlet opening of c	collocated PM10 and PM2.5sam	plers for PM10-2.5 (X	Yes No
within 2 to 4 m of each ot			
	d PM2.5 sampler inlets within 1	m vertically of each	Yes No
other? Is probe > 20 m from the	nearest tree drip line? Yes	*No (answer *	'd guestions)
	rest tree drip line? Yes \(\Boxed{1}\) *No \(\Boxed{1}\)		. ,
	t tree (m) Direction from prob		
	air flow? *Yes [ (answer *'d		• • • • • • • • • • • • • • • • • • • •
	istance from probe inlet (m)		
	obstacle at least twice the height that degrees blocked (see instructions)	the obstacle protrudes abo	we the probe? Yes \[ \] No \[ \]
RECOMMENDATION	rude)	_	
	e status? Yes $\boxtimes$ *No $\square$ (a)	nswer *'d questions)	
	objective? Yes (enter new		No $\square$
	presentativeness? Yes (enter new		To $\square$
*4) Relocate site? Ye		) 1.	· <b>L</b>
Comments: None			
Comments: None.			
Date of Last Site Pictur	res: <u>12/21/2020</u> New Pictures S	Submitted? Yes 🔀 1	No 🔲
Reviewer PJC			Date: <u>January 8, 2021</u>
Ambient Monitoring Co	oordinator <u>PJC</u>		Date: <u>1/8/2021</u>

### **Site Information**

Site Name Crouse

AQS Site # 37-109-0004

Street Address-1487 Riverview Road			City Lin						
Urban Area Not	t in an Urban Area   Core-based State			d Stati	stical Are	a Charlo	tte-Gasto	nia-Conco	rd, NC-SC
	Enter Exact								
	<u>.4385</u> Longitude <u>-81.2767</u>						d of Mea		
In Decimal Degrees In Decimal Degrees Other (explain) Explanation: NCDOT Map  Elevation Above/below Mean Sea Level (in meters) 265							T Maps		
		,			220077		<u> 265</u>		
Name of nearest road to inlet probe <u>Riverview Road</u> ADT <u>2200</u> Year latest available <u>2019</u>									
Distance of ozone pr	robe to near	est traffic la	ne (m) <u>52.8</u> I	Direction	on from 02	zone probe to	o nearest	traffic lane	SSW
Comments: None.									
Name of nearest ma									
Distance of site to no	earest major	road (m) $8$	38.40 Direction	on fror	n site to no	earest major	road N	$\underline{\mathbf{W}}$	
Comments: None.									
Site located near ele	ctrical subst	ation/high v	oltage power	r lines?				Yes 🗌	No 🛛
Distance of site to no						(m) <u>303</u> ]	Direction	to RR W	□NA
**OPTIONAL** Di							(m)		ection
Distance between sit									_ NA
Explain any sources						storage, sta	cks, ven	ts, railroad	tracks,
construction activities	es, fast food	restaurants,	and swimmi	ing poo	ols.				
None noted.									
ANSWER ALL APP	LICABLE O	DUESTIONS	<b>.</b>						
Parameters		oring Obj			Scale			Site Type	e
<b>◯</b> O <sub>3</sub>		l/Backgrou		Mic	ro		⊠SLA		
		Concentra		—   Mic			Mary	UVIS	
	_	3 Concentra					□SPM	1	
		ion Exposu Oriented	ire [	Nei	ghborhoc	od			
	Transpo			<b>\</b> Urb	an				
		l Backgrou	nd [	Reg	rional				
		e Related In			31011a1				
Probe inlet height	(from grou	nd) 2-15 m	? Yes 🖂	No					
Give actual measur	red height f	from groun	d (meters)	3.50					
Distance of outer e	edge of prol	oe inlet froi	m horizonta	ıl (wal	l) and/or	vertical (ro	of) supp	orting	
structure > 1 m? Y	es No								
Actual measured distance from outer edge of probe to supporting structure (meters) 1.3									
Is probe > 20 m fro	om the near	est tree dri	p line? Y	es 🖂	*No 🗌	answer '	*'d ques	tions)	
*Is probe > 10 m from						of trees within	10 meter	rs	
*Distance from probe							of tree abo	ove probe (n	1)
Are there any obsta	acles to air	flow? *Yes	s ∐ (answe	er *'d	questions	) No 🔀			
*Identify obstacle _									¬ <sub>No</sub> □

Region\_MRO

RECOMMENDATIONS.
1) Maintain current site status? Yes ⊠ *No □ (answer *'d questions)
*2) Change monitoring objective? Yes [ (enter new objective:) No [
*3) Change scale of representativeness? Yes [ (enter new scale: ) No [
*4) Relocate site? Yes No No
Comments: None.
Date of Last Site Pictures: <u>January 4, 2021</u> New Pictures Submitted? Yes No
Reviewer PJC Date: January 8, 2021
Ambient Monitoring Coordinator PJC Date: 1/8/2021

#### **Instructions:**

DECOMMENDATIONS:

**Trees**: The probe or inlet must be at least 10 meters or further from the drip line of trees. A distance of at least 20 meters between the probe and any tree or trees is preferred.

Obstacles: An obstacle is anything that restricts air flow. A tree can be an obstacle because it has branches and leaves that restrict the flow of air but a pole is not considered to be an obstacle. To avoid interference from obstacles, the probe or inlet must have unrestricted airflow and be located away from obstacles. The distance from the obstacle to the probe or inlet must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path.

If the annual network review has indicated that the monitoring objectives and scale of representativeness for the site have not changed and the siting criteria still meets those monitoring objectives and that scale of representativeness and there are no other reasons to modify the site in any way, check "Yes" to the question "Maintain current site status?" and skip the rest of the recommendations section.

If the annual network review has indicated that the monitoring objectives, scale of representativeness, or siting criteria have changed for some reason or there is another reason to modify the site in some way, check "No" to the question "Maintain current site status?" and complete the rest of the recommendations section. If the monitoring objective or scale of representativeness needs to be changed, check the "Yes" box and write in the new monitoring objective or scale of representativeness on the line. Otherwise check the "No" box. If the site needs to be relocated, check the "Yes" box. If the site needs to be shut down, write "Shut down" in the comments line. Also, use the comments line to explain any change requested.

Check the site picture archive to find out when the last set of site pictures were taken and write the date down on the line. If the pictures are more than five years old or if something at the site has changed in the past year, take new site pictures. Changes that require new site pictures include additions, removals, or movement of monitors at the site, growth or removal of trees and other shrubs at the site, and construction of roads or buildings at or in the vicinity of the site.

Pictures of the site should at a minimum include at least one picture showing the site itself and pictures standing at the probe or inlet or as close as possible to the probe or inlet looking in the four compass directions (north, east, south, and west). If meteorological data are collected at the site, pictures standing at the meteorological tower looking southwest and northeast should also be included. Sometimes pictures looking at the site from the four compass directions are also helpful.

Be sure to correctly identify the pictures as to which compass direction they show. This documentation may be achieved by using good notes when taking the pictures, holding a compass in front of the camera, or placing a sign with the appropriate direction indicated somewhere in the picture. Label the pictures with the name of the site using the two-digit logger ID (HC, JW, *etc.*), the direction (N, NE, E, SE, S, SW, W, NW), and the date taken (YYYYMMDD) and transfer the pictures to the group drive in the appropriate Incoming/Regional Office directory.

#### **Site Information**

Region_MRO Site Name Monroe Middle School				001			te # 37- <u>179</u> - <u>0003</u>	
Street Address-701 Charles Street					City Monro			
Urban Area MONROE Core-based Sta			d Stat	istical Area	Charlo	otte-Gastonia-Concord,	NC-SC	
	Enter E							
	0.5410	Longitude		39			d of Measuring	
In Decimal Degrees		In Decimal	<del></del>		Other (expla	ain) E	xplanation: Google M	laps_
Elevation Above/below Mean Sea Level (in meters) <u>184.00</u>								
Name of nearest road to inlet probe <u>Charles Street</u> ADT <u>3400</u> Year latest available <u>2019</u>								
-	probe to neare	st traffic lan	e (m) <u>71</u> Dire	ection	from ozone p	probe to	nearest traffic lane $\underline{W}$	
Comments: None.								
Name of nearest ma	-					<u>2019</u>		
Distance of site to n	nearest major	road (m) <u>15</u>	548.00 Direc	ction f	rom site to ne	arest ma	jor road <u>ENE</u>	
Comments: None.								
Site located near ele	ectrical substa	ntion/high vo	ltage power	lines	?		Yes 🗌 🗈	No 🛛
Distance of site to n						(m) <u>975</u>	Direction to RR NE	□NA
**OPTIONAL** D								ion <u>NE</u>
Distance between si								NA
						orage, sta	icks, vents, railroad trac	cks,
construction activiti	ies, fast food	restaurants, a	and swimmir	ng po	ols.			
None.								
	ANSWER ALL APPLICABLE QUESTIONS:							
ANSWER ALL API	PLICABLE Q	UESTIONS:						
Parameters	_	UESTIONS: oring Obje			Scale		Site Type	
	Monito General	oring Obje /Backgroun	ctive	]Mio				
Parameters	Monite ☐General ☐Highest	oring Obje /Backgroun Concentrat	ctive		ero		⊠SLAMS	
Parameters	Monite General Highest Max O3	oring Objection /Backgroun /Backg	ctive	_ ]Mio	cro idle			
Parameters	Monite General Highest Max O3	Pring Objet / Backgroun Concentrate Concen	ctive ad ion tion Tre	_ ]Mio ⊠Nei	cro Idle ghborhood		⊠SLAMS	
Parameters	Monite ☐General. ☐Highest ☐Max O3 ☐Populati ☐Source 0 ☐Transpo	Pring Object / Backgroun Concentrate Concentrate Concentrate Concentration Exposurion Ex	ctive and cion tion tree	_ ]Mio	cro Idle ghborhood		⊠SLAMS	
Parameters	Monito General. Highest Max O3 Populati Source O Transpo	Pring Object / Backgroun Concentrate Conce	ctive ad ion tion re	_ ]Mio ]Nei ]Urb	cro Idle ghborhood		⊠SLAMS	
Parameters  O <sub>3</sub>	Monito General. Highest Max O3 Populati Source O Transpo Upwind Welfare	Pring Objet /Backgroun Concentrate Concentrate Concentrate Concentrate Concentration Exposurion Exposurion Exposurion Exception Exception Exception Concentrate Exception Exception Exception Concentrate Exception Exce	ctive  ad ion tion re  ad pacts	_Mio Nei _Urb _Reg	cro ddle ghborhood oan		⊠SLAMS	
Parameters O3 Probe inlet height	Monite General Highest Max O3 Populati Source Transpo Upwind Welfare	Dring Obje /Backgroun Concentration Exposurion Exposurion Oriented ort Background Related Imad) 2-15 m?	ctive  ad ion tion re  ad apacts  Yes   Id I	Mio Nei Urt Reg	cro ddle ghborhood oan		⊠SLAMS	
Parameters  O <sub>3</sub>	Monite General. Highest Max O3 Populati Source O Transpo Upwind Welfare (from groun	Pring Object / Backgroun Concentrate Concentrate Concentrate Oriented Ort Background Related Image (2-15 m?)	ctive ad ion tion re  Ad appacts  Yes   I (meters) 3	Mio Nei Urt Reg No □	cro ddle ghborhood oan gional	tical (ro	⊠SLAMS □SPM	
Probe inlet height Give actual measu Distance of outer	Monite General Highest Max O3 Populati Source Transpo Upwind Welfare (from groun	Dring Objet /Backgroun Concentrat	ctive ad ion tion re  Ad appacts  Yes   I (meters) 3	Mio Nei Urt Reg No □	cro ddle ghborhood oan gional	tical (ro	⊠SLAMS □SPM	
Probe inlet height Give actual measu Distance of outer structure > 1 m? Y	Monite General Highest Max O3 Populati Source Transpo Upwind Welfare (from groun ared height fredge of prob	Dring Obje /Backgroun Concentrat	ctive  ad ion tion re  Ad apacts  Yes   (meters) 3 a horizontal	Mio Nei Urb Reg No 3.90 (wal	cro ddle ghborhood pan gional  ]  ]  and/or ver	,	SLAMS SPM of) supporting	
Probe inlet height Give actual measu Distance of outer	Monite General Highest Max O3 Populati Source Transpo Upwind Welfare (from groun ared height fi edge of prob	Dring Obje  /Backgroun Concentrat	ctive  Id  Id  In  In  In  In  In  In  In  In	Mid Mei Urb Reg No 3.90 l (wal	cro ddle ghborhood pan gional  l) and/or ver porting struc	ture (m	SLAMS SPM of) supporting	
Probe inlet height Give actual measu Distance of outer structure > 1 m? Y Actual measured of Is probe > 20 m from *Is probe > 10 m from	Monite General Highest Max O3 Populati Source Transpo Upwind Welfare (from groun ared height fredge of prob Yes No distance from Tom the neares	Dring Obje  /Backgroun Concentrat	ctive  Id	Mio Nei Urb Reg No 3.90 (wal	cro ddle ghborhood oan gional  l) and/or ver porting struc *No [] (a	ture (m	SLAMS SPM of) supporting eters) 1.10 *'d questions)	
Probe inlet height Give actual measu Distance of outer structure > 1 m? Y Actual measured of Is probe > 20 m from *Is probe > 10 m from *Distance from probe	Monite General Highest Max O3 Populati Source Transpo Upwind Welfare (from groun ared height fredge of prob Yes No distance from Tom the nearest the to closest tree	Dring Obje /Backgroun Concentrat	tion tion tion Tre  Ad apacts  Yes   (meters) 3 a horizontal e of probe to line? Yes Ves   Yes   Yes	Mid Nei  Vrt Reg No 3.90 (wal co sup es   Jo □ m prob	ddle ghborhood pan gional  l) and/or ver porting struc *No [ (a	eture (meanswer ees within *Height	SLAMS SPM of) supporting eters) 1.10 *'d questions)	
Probe inlet height Give actual measu Distance of outer structure > 1 m? Y Actual measured of Is probe > 20 m from *Is probe > 10 m from	Monite General Highest Max O3 Populati Source Transpo Upwind Welfare (from groun ared height fredge of prob Yes No distance from Tom the nearest the to closest tree	Dring Obje /Backgroun Concentrat	tion tion tion Tre  Ad apacts  Yes   (meters) 3 a horizontal e of probe to line? Yes Ves   Yes   Yes	Mid Nei  Vrt Reg No 3.90 (wal co sup es   Jo □ m prob	ddle ghborhood pan gional  l) and/or ver porting struc *No [ (a	eture (meanswer ees within *Height	of) supporting eters) 1.10 *'d questions) 1 10 meters	

RECOMMENDATIONS.
1) Maintain current site status? Yes ⊠ *No □ (answer *'d questions)
*2) Change monitoring objective? Yes [ (enter new objective:) No [
*3) Change scale of representativeness? Yes [ (enter new scale: ) No [
*4) Relocate site? Yes No No
Comments: None.
Date of Last Site Pictures: January 4, 2021 New Pictures Submitted? Yes No
Reviewer MWHDate: December 22, 2020
Ambient Monitoring Coordinator PJC Date: 1/8/2021

#### **Instructions:**

DECOMMENDATIONS.

**Trees**: The probe or inlet must be at least 10 meters or further from the drip line of trees. A distance of at least 20 meters between the probe and any tree or trees is preferred.

Obstacles: An obstacle is anything that restricts air flow. A tree can be an obstacle because it has branches and leaves that restrict the flow of air but a pole is not considered to be an obstacle. To avoid interference from obstacles, the probe or inlet must have unrestricted airflow and be located away from obstacles. The distance from the obstacle to the probe or inlet must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path.

If the annual network review has indicated that the monitoring objectives and scale of representativeness for the site have not changed and the siting criteria still meets those monitoring objectives and that scale of representativeness and there are no other reasons to modify the site in any way, check "Yes" to the question "Maintain current site status?" and skip the rest of the recommendations section.

If the annual network review has indicated that the monitoring objectives, scale of representativeness, or siting criteria have changed for some reason or there is another reason to modify the site in some way, check "No" to the question "Maintain current site status?" and complete the rest of the recommendations section. If the monitoring objective or scale of representativeness needs to be changed, check the "Yes" box and write in the new monitoring objective or scale of representativeness on the line. Otherwise check the "No" box. If the site needs to be relocated, check the "Yes" box. If the site needs to be shut down, write "Shut down" in the comments line. Also, use the comments line to explain any change requested.

Check the site picture archive to find out when the last set of site pictures were taken and write the date down on the line. If the pictures are more than five years old or if something at the site has changed in the past year, take new site pictures. Changes that require new site pictures include additions, removals, or movement of monitors at the site, growth or removal of trees and other shrubs at the site, and construction of roads or buildings at or in the vicinity of the site.

Pictures of the site should at a minimum include at least one picture showing the site itself and pictures standing at the probe or inlet or as close as possible to the probe or inlet looking in the four compass directions (north, east, south, and west). If meteorological data are collected at the site, pictures standing at the meteorological tower looking southwest and northeast should also be included. Sometimes pictures looking at the site from the four compass directions are also helpful.

Be sure to correctly identify the pictures as to which compass direction they show. This documentation may be achieved by using good notes when taking the pictures, holding a compass in front of the camera, or placing a sign with the appropriate direction indicated somewhere in the picture. Label the pictures with the name of the site using the two-digit logger ID (HC, JW, *etc.*), the direction (N, NE, E, SE, S, SW, W, NW), and the date taken (YYYYMMDD) and transfer the pictures to the group drive in the appropriate Incoming/Regional Office directory.

#### **Site Information**

Region MRO Site Name Rockwell			AQS Site # 37- <u>159</u> - <u>0021</u>			
			City Rockwell			
Urban Area Not in an	urban Area	ntistical Area Cha	arlotte-Concord-Gastonia, NC-SC			
	Enter Exact					
<b>Latitude</b> <u>-80.3953</u>				thod of Measuring		
In Decimal Degrees	In Decima	l Degrees	Other (explain)	<b>Explanation:</b> Google Maps		
Elevation Above/below I				<u>234.00</u>		
Name of nearest road to inle	et probe Gold Hill R	oad ADT 650 Yea	ar latest available 20	19		
Comments: None.						
Distance of site to nearest m	najor road (m) 370.0	00 Direction from s	ite to nearest major roa	ad <u>S</u>		
Name of nearest major road	HWY 52 ADT 81	100 Year 2018				
Comments: None.						
Site located near electrical s	substation/high voltag	ge power lines?		Yes ☐ No 🛛		
Distance of site to neares	t railroad track		(m) <u>7</u>	737 Direction to RR SW NA		
**OPTIONAL** Distance	ce of site to nearest	power pole w/tra	nsformer	(m) Direction		
Distance between site and d						
				, stacks, vents, railroad tracks,		
construction activities, fa	st food restaurants,	and swimming p	ools.			
None noted.						
ANGWED ALL ADDLIC	DIE QUECTIONS	٠.				
ANSWER ALL APPLICATION Parameters	ABLE QUESTIONS  Monitoring C		Scale	Monitor Type		
	Monitoring	bijective	Scare	Womtor Type		
□ NA □ SO (NA A OS)	General/Backgro	ound	Micro	SLAMS		
	Highest Concent	ration	Middle	SPM		
NO <sub>2</sub> (NAAQS)	Max O3 Concen	tration				
□HSNO <sub>y</sub>	Population Expo	sure		Monitor Network Affiliation		
$\bigcirc O_3$	Source Oriented		Neighborhood	NCORE		
☐ NH <sub>3</sub> ☐ Hydrocarbon	Transport		⊠Urban			
Air Toxics	Upwind Backgro	ound	Regional	Unofficial PAMS		
CO (trace-level)	Welfare Related					
		puru				
Probe inlet height (from gr	ound) 2-15 m? Yes	No 🗌 C	ive actual measured h	eight from ground (meters) 3.50		
Distance of outer edge of p	orobe inlet from horiz	contal (wall) and/or	vertical (roof) support	ing structure > 1 m? Yes ☑ No		
		1				
Actual measured distance f						
Distance of outer edge of p  Is probe > 20 m from the n			inlets > 1 m? (answer *'d questio	Yes No NA ns)		
*Is probe > 10 m from the	-		*Number of trees v			
*Distance from probe to cle	•	Direction from p		ight of tree above probe (m)		
Are there any obstacles to				.g.n. or u.e. u.e. p.e.e (m)		
*Identify obstacle	Distance from probe	inlet (m) D	irection from probe inl	et to obstacle		
*Is distance from inlet prob	*Identify obstacle Distance from probe inlet (m) Direction from probe inlet to obstacle					
Distance of probe to nearest traffic lane (m) 17 Direction from probe to nearest traffic lane N						

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Parameters	Monitoring Objective	Scale	Site Type			
NA	General/Background	Micro	SLAMS			
Air flow < 200 L/min ☐ PM2.5 FRM	Highest Concentration	Middle	SPM			
PM10 FRM	☑Population Exposure	Neighborhood				
☐ PM10 Cont. (BAM) ☐ PM10-2.5 FRM	Source Oriented	Urban	Monitor NAAQS Exclusion			
☐ PM10-2.5 BAM	Transport	Regional	NONREGULATORY			
PM2.5 Cont. (BAM)	Welfare Related Impacts		NONREGULATORI			
Probe inlet height (from	ground)	n	> 15 m			
	e from probe inlet to ground (meters)					
	Probe inlet from horizontal (wall) as e from outer edge of probe inlet to su					
	thom outer edge of probe filler to su	apporting structure (meters				
	ter edge of probe inlets of any low vo	olume monitor and any oth	rer Yes No NA			
low volume monitor at the	ne site = 1 m or greater?  onitors (Two FRMs, FRM & BAM,	DAM &				
BAM) Located at Site?	olinois (Two Privis, Privi & Daivi,	*Yes 🗌 (a	nnswer *'d questions) No 🛛 NA			
	collocated PM 2.5 samplers (X) with		1 x			
each other?  *Are collocated PM2.5 s	ampler inlets within 1 m vertically of	The state of the s	No Give actual (meters)			
7 He conocated 1 W12.5 S	amplet mets within 1 in vertically of		No ☐ Give actual (meters)			
Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the site to measure PM10-2.5?  *Yes \sum (answer *'d questions) No \sum NA						
* Entire inlet opening of collocated PM10 and PM2.5samplers for PM10-2.5 (X)						
within 2 to 4 m of each o		S 101 1 W110-2.5 (A)	Yes No No			
	nd PM2.5 sampler inlets within 1 m v		Yes No No			
Is probe $> 20$ m from the	nearest tree drip line? Yes 🛛 *	*No 🗌 (answer *'d questi	ons)			
	e nearest tree drip line? Yes 🔲 🤻					
*Distance from probe to	closest tree (m) Direction fr	om probe to tree *H	eight of tree above probe (m)			
Are there any obstacles to	o air flow? *Yes [ (answer *'d que	stions) No 🛛				
*Identify obstacle	Distance from probe inlet (m)	Direction from probe inl	et to obstacle			
*Is distance from inlet pr	obe to obstacle at least twice the heigh	ght that the obstacle protru	des above the probe? Yes \(\sigma\) No			
Distance of probe to near	rest traffic lane (m) 18 Direction f	rom probe to nearest traffi	c lane N			
RECOMMENDATIONS		<u>-</u>	<u></u>			
	tatus? Yes ⊠ *No 🗌 (answer *	'd questions)				
	bjective? Yes ☐ (enter new objective)					
*3) Change scale of repre						
	□ No □	, same				
Comments:						
Date of Last Site Pictures	12/17/2020 New Pictures Submitte	d? Yes 🛛 No 🗌				
Reviewer MWH			Date December 22, 202			
Ambient Monitoring Coo	rdinator PJC		DateJanuary 8, 2021			

#### **Appendix C-2. Scale of Representativeness**

Each agency must describe each station in the monitoring network in terms of the physical dimensions of the air parcel nearest the monitoring station throughout which actual pollutant concentrations are reasonably similar. Area dimensions or scales of representativeness used in the network description are:

- a) Micro-scale defines the concentration in air volumes associated with area dimensions ranging from several meters up to about 100 meters.
- b) Middle scale defines the concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometers.
- c) Neighborhood scale defines concentrations within an extended area of a city that has relatively uniform land use with dimensions ranging from about 0.5 to 4.0 kilometers.
- d) Urban scale defines an overall citywide condition with dimensions on the order of 4 to 50 kilometers.
- e) Regional Scale defines air quality levels over areas having dimensions of 50 to hundreds of kilometers.

Closely associated with the area around the monitoring station where pollutant concentrations are reasonably similar are the basic monitoring exposures of the station.

There are six basic exposures:

- a) Sites located to determine the highest concentrations expected to occur in the area covered by the network.
- b) Sites located to determine representative concentrations in areas of high population density.
- c) Sites located to determine the impact on ambient pollution levels of significant sources or source categories.
- d) Sites located to determine general background concentration levels.
- e) Sites located to determine the extent of regional pollutant transport among populated areas.
- f) Sites located to measure air-pollution impacts on visibility, vegetation damage or other welfare-based impacts and in support of secondary standards.

The design intent in siting stations is to match correctly the area dimensions represented by the sample of monitored air with the area dimensions most appropriate for the monitoring objective of the station. The following relationship of the six basic objectives and the scales of representativeness are appropriate when siting monitoring stations:

**Table C7. Site Type Appropriate Siting Scales** 

1. Highest concentration	Micro, middle, neighborhood, sometimes urban or regional for secondarily formed pollutants
2. Population oriented	Neighborhood, urban
3. Source impact	Micro, middle, neighborhood
4. General/background & regional transport	Urban, regional
5. Welfare-related impacts	Urban, regional