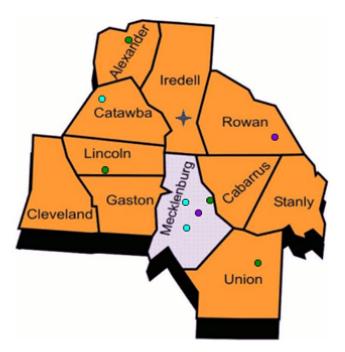


2017-2018 Annual Monitoring Network Plan for the North Carolina Division of Air Quality

Volume 2

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

C. The Mooresville Monitoring Region



June 30, 2017



State of North Carolina | Department of Environmental Quality | Division of Air Quality 1641 Mail Service Center | 217 W. Jones Street, Suite 4000 | Raleigh, NC 27699-1641 919 707 8400 T

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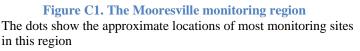
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C. The Mooresville Monitoring Region

The Mooresville monitoring region, shown in Figure C1, consists of four areas: (1) the eastern portion of the Hickory-Lenoir-Morganton metropolitan statistical area, 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.





(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, 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. The locations of these monitors are shown in Figure C2.



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.

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

At the Taylorsville-Liledoun site, DAQ operates a seasonal ozone monitor. 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. This site was established as the downwind site for the Hickory-Lenoir-Morganton MSA in 2013 to replace the Taylorsville-Waggin Trail site. The DAQ 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. 40 CFR 58 Appendix D requires the Hickory-Lenoir-Morganton MSA to have two ozone monitoring sites.



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

Table C1.	Site I	able	101	1 ay 101 S		e-Lileu	loun						
Site Name:	Taylo	orsville	Lile	doun			AQS S	ite Iden	tification	Nu	mber:	37-00	3-0005
Location:	700 L	700 Liledoun Road, Taylorsville, North Carolina											
CBSA:Hickory-Lenoir-Morganton, NCCBSA #:25860											0		
Latitude (35.9139) I	Long	itude	-81.1	9	Datum:		WGS84	El	evation		365 meters
Parameter								Metho	od		Sample		
Name	Meth	od						Refer	ence ID		Duration	Sa	mpling Schedule
Ozone	Instru	imenta	l with	h ultra vio	olet p	hotomet	ry, 047	EQOA	-0880-04	7	1-Hour	Ma	arch 1 to Oct. 31
Date Monito	or Estal	blished	l: (Ozone							1	Aug. 2	2, 2013
Nearest Roa	d:	Lil	edou	n Road		Traffi	c Count:	7400			Year of Co	unt:	2014
Parameter N	Name	Dista	nce t	nce to Road Direction to Road Monitor Type Statement of Purpose						pose			
										Re	eal-time A	QI rep	orting and
Ozone		2	19 m	eters		South	east	SLAM	1S	fo	recasting.	Compl	liance w/NAAQS.
							Suitabl	e for C	ompariso	n			
Parameter N	Name	Moni	itoriı	ng Objec	tive	Scale	to NAA	QS			Proposa	l to N	Iove or Change
Ozone		Gene	ral B	ackgroun	d	Urban		Ye	S		None		
					Meets Part 58 Requirements for:								
Parameter N	Name			Appendix AAppendix CAppendix DAppendix E								Appendix E	
Ozone				Ye	Yes Yes		Yes	Yes Yes Yes					Yes
Parameter N	Name		Pro	obe Heigl	ht Distance to S		nce to Support		star	nce to Tree	es	Obstacles	
Ozone				3.65 met	ers		1.06 n	06 meters > 20 meters None					None

Table C1. Site	Table for	Taylorsville-Liledoun
----------------	------------------	------------------------------



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

The Taylorsville-Liledoun site was established on Aug. 2, 2013, after DAQ 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. A meteorological tower is operated by the State Climate Office 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.

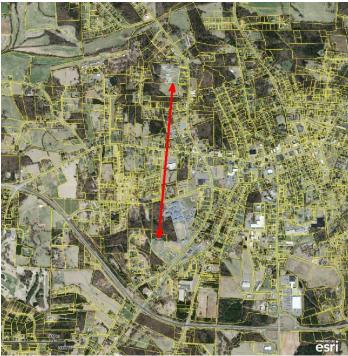


Figure C8. Relationship between old Waggin Trail site (to the north) and Taylorsville Liledoun site (to the south)

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. The site is shown in Figure C9. Table C2 summarizes monitoring information for the site. Views looking north, northeast, east, southeast, south, southwest, west and northwest from the site are shown in Figure C10 to Figure C17.



Figure C9. Lenoir ozone and sulfur dioxide monitoring site

	able	IOI LEIN														
Leno	ir				A	QS Si	te Iden	tification N	Number:	37	-027	7-0003				
291 N	Juway (Circle, Le	noir, No	orth Carol	ina											
	Hick	ory-Lenoi	-Morga	nton, NC				CBSA #	:	25	5860					
35.935	5833	Longitud	e -81	.530278	Da	tum:	WC	GS84	Elevation	1		366 meters				
							Metho	d	Sample			mpling				
Meth	od						Refere	nce ID	Duratio	n	Scl	hedule				
Instru	ımental	with ultra	violet j	photomet	ry, 04	47	EQOA	-0880-047	1-Hour		Ma	urch 1 to Oct. 31				
Instru	imental	with puls	ed fluor	escence,	060						Ye	ar-round; every				
							EQSA	-0486-060	1-Hour		thi	rd year				
r Fetal	blichod									Jan	n. 1, 1	1981				
I Esta	onsneu	• Sulfur	dioxide	•						Jan	n. 1, 2	2013				
d:	Nuwa	y Circle	Tı	raffic Co	unt:		500		Year of O	Coun	t:	2015				
lame	Dista	nce to Ro	ad Di	irection t	to Road Monitor Type			or Type	Statement of Purpose				· · · · ·			pose
									Real-time AQI reporting & for							
	14	16 meters		Eas	t		SLAM	S	casting. C	Comp	liano	ce w/NAAQS.				
									Preventio	n of	signi	ificant				
e	14	16 meters		Eas	t		Specia	l purpose	deteriorat	ion, l	PSD	, Modeling				
lame	Moni	toring Ol	jective	Scal	e	Com	iparisoi	n to NAAQ	QS Prop	osal	to N	Iove or Change				
	Gen	eral backg	round	Region	nal		Y	es			N	one				
e	Gen	eral backg	round	Region	nal		Yes None					one				
						Me	ets Part	t 58 Requi	rements:							
lame		Ар	pendix	Α	Appe	endix	C	Ар	pendix D			Appendix E				
			Yes			Yes				Yes						
e			Yes			Yes	s Yes Yes				Yes					
lame		Probe H	eight	Dis	tance	e to S	upport	Dis	tance to T	rees		Obstacles				
	4.42 meters		ters		1.5	5748 1	meters		>20 meter	s		None				
e		4.485 n	eters		1.	5748	meter		>20 meter	s		None				
	Leno 291 N 35.935 Meth Instru Instru r Estal d: fame e fame	Lenoir 291 Nuway Antick 291 Nuway Hick 35.935833 Method Instrumental	Lenoir 291 Nuway Circle, Ler 291 Nuway Circle, Ler Hickory-Lenoir 35.935833 Longitude Method Instrumental with ultra Instrumental with pulse Ozone r Established: Ozone fame Distance to Roa ame Instrumental with ultra General backg General backg e General backg fame Probe He fame Probe He	291 Nuway Circle, Lenoir, Norga Hickory-Lenoir-Morga 35.935833 Longitude Antiput the second of	Lenoir 291 Nuway Circle, Lenoir, North Carol Hickory-Lenoir-Morganton, NO 35.935833 Longitude -81.530278 Method Instrumental with ultra violet photomet Instrumental with pulsed fluorescence, Ozone T Established: Ozone Ozone Sulfur dioxide diffic Co fame Ozone IA6 meters Eas e 146 meters Eas General background Region General background Region General background Region General background Region Yes Eas Game Yes General background Region Yes S General background Region Yes S General background Region <td>Lenoir Additional state in the interval of the interval</td> <td>AQS Si291 Nuway Circle, Lenoir, North CarolinaHickory-Lenoir-Morganton, NC35.935833Longitude-81.530278Datum:Method-81.530278Datum:Instrumental with ultra violet photometry, 047Instrumental with pulsed fluorescence, 060OzoneT Established:OzoneSulfur dioxided:Nuway CircleTraffic Count:fameDistance to RoadDirection to Roadi146 metersEaste146 metersEastfameGeneral backgroundRegionaleGeneral backgroundRegionaleYes</td>	Lenoir Additional state in the interval of the interval	AQS Si291 Nuway Circle, Lenoir, North CarolinaHickory-Lenoir-Morganton, NC35.935833Longitude-81.530278Datum:Method-81.530278Datum:Instrumental with ultra violet photometry, 047Instrumental with pulsed fluorescence, 060OzoneT Established:OzoneSulfur dioxided:Nuway CircleTraffic Count:fameDistance to RoadDirection to Roadi146 metersEaste146 metersEastfameGeneral backgroundRegionaleGeneral backgroundRegionaleYes									

Table C2. Site Table for Lenoir



Figure C10. Looking north from the Lenoir site



Figure C11. Looking northeast from the Lenoir site



Figure C12. Looking northwest from the Lenoir site



Figure C15. Looking east from the Lenoir site



Figure C13. Looking west from the Lenoir site



Figure C16. Looking southeast from the Lenoir site



Figure C14. Looking southwest from the Lenoir site



Figure C17. Looking south from the Lenoir site

35°43'44" N 81°21'56" W

Figure C18. Hickory fine particle monitoring site



Figure C19. Looking north from the Hickory site

At the Hickory site, the DAQ operates an one-in-six-day fine particle collocated federal reference method, FRM, monitor and a continuous fine particle monitor. The one-insix-day speciation fine particle SASS and University Research Glass, URG, monitors and the two one-in-six-day high volume PM10 monitors were shut down in 2014. In 2015 a second continuous fine particle monitor that recently received equivalency status was added to the site so DAQ could evaluate its performance. On Jan. 1, 2017, the DAQ 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 C20. Looking northeast from the Hickory site



Figure C21. Looking northwest from the Hickory site



Figure C22. Looking west from the Hickory site



Figure C23. Looking southwest 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 Tal	ble Ior	HICK	ory									
Site Name:	Hickory					AQS	Site Ider	ntifi	cation Nu	mber	37-	035-0004	4
Location:	1650 1st	Street,	Hickor	y, North Ca	rolina								
MSA:		Hickory	-Lenoi	ir-Morganto	on, NC			C	BSA #:		258	360	
Latitude		35.7288	389	Longitu	de	-81.36	55556	Da	atum:		WGS84		
Elevation		333 me	ters										
Parameter N	ame	Meth	od		Meth Refe		e ID	Samp Durat		Sampli Schedu			
PM 2.5 local conditions, F	RM		ampler	el 2025 PM w/VSCC -				5-10	06-145	24-Ho	our	Every S Year R	Sixth Day, ound
PM 2.5 local conditions, B		VSC	С	AM-1022 M		itor w		M-10	013-209	1-Hou	ır	Year R	
Date Monito Established:	r			Local Cond local condit		<u>M 10</u>	22					Jan. 1, Sept. 14	
Nearest Roa	d:		2 nd A	venue SW		Traff	fic Count	:	3400	Y	ear of	f Count:	2013
Parameter N	ame		Dista Road	nce to l	Directi to Roa		Monitor	·Ty				Purpos	
PM 2.5 local FRM	M 2.5 local conditions, RM 22.2						SLAMS, Collocat					v/NAAQ Prequire	S. AQI d monitor.
PM 2.5 local BAM 1022	condition	s,	21.3	4 meters	Sout southe		SLAMS			Compliance w/NAAQS. AQ reporting. SIP required monit			
Parameter N	ame			Monito Objec			Scale		Suitable Compar to NAA	rison	Prop Chan	osal to N ige	love or
PM 2.5 local	condition	s, FRM		Popula Expos Popula	sure	Nei	ghborhoo	od	Yes		None		
PM 2.5 local	condition	s, BAM	1022	Expos	sure	_	ghborhoo		No		None		
Parameter N	Parameter Name			Meets P Append Require	lix A	Α	eets Part ppendix quireme	С	Арр	ts Part pendix tireme	D	Арр	ts Part 58 Dendix E Direments
PM 2.5 local		s. FRM		Ye			Yes			Yes			Yes
PM 2.5 local		,	1022	Ye			Yes			Yes			Yes
Parameter N		,	-	Probe He		1	1	e to	Support	-	nce to	Trees	Obstacles
PM 2.5 local		s, FRM			8 meters	5			neters		20 me		None
PM 2.5 local			1022		2 meters			-	neters		-20 me		None
		1					·						

Table C3. Site Table for Hickory

Both one-in-six day PM10 monitors were shut down on Dec. 31, 2014. The PM10 monitor was not required by 40 CFR 58 Appendix D, the DAQ did not use the PM10 data from this site for permit modeling and the monitor was no longer needed to ensure an adequate PM10 network. The United States Environmental Protection Agency, EPA, ended the funding for the analysis of the SASS and URG samples in January 2015. Thus, the DAQ also shut down these monitors in 2014. At the end of December 2015, the well impactor ninety-six, WINS, on the FRM was replaced with a very sharp cut cyclone, VSCC. This change was made because the VSCC is easier and less expensive to maintain.

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 tons of lead emissions to the air.¹

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 58 Appendix D for population exposure monitoring in urban areas. Seasonal ozone monitoring started 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.

The 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. 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 be required to operate 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 of Shelby is in the county. The 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 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 monoxide 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 10 counties: 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

¹ United States Environmental Protection Agency. 2015 Toxic Release Inventory, released March 2017, available on the worldwide web at <u>https://iaspub.epa.gov/triexplorer/tri_release.chemical</u>..

Carolina. Currently DAQ operates three monitoring sites in the Charlotte-Gastonia-Concord MSA, Mecklenburg County Air Quality, MCAQ, operates four and the South Carolina Department of Health and Environmental Conservation, DHEC, operates one. These sites are located at Crouse in Lincoln County, Remount Road, Garinger High School, University Meadows and Montclaire in Charlotte in Mecklenburg County, Rockwell in Rowan County, Monroe in Union County and York in York County, South Carolina. The locations of these monitors are shown in Figure C27.

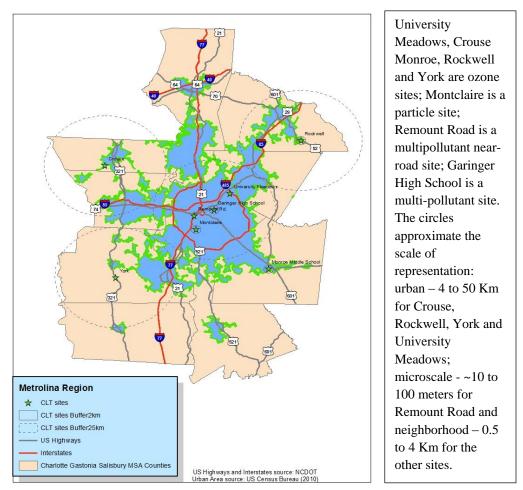


Figure C27. Monitoring sites in the Charlotte-Concord-Gastonia MSA

The 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 MCAQ was evicted from the Arrowood site in Mecklenburg County and at the end of the 2015 ozone season MCAQ was evicted from the County Line site also in Mecklenburg County. 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 the monitor could be moved to the Remount Road near-road site. The DAQ shut down the **Grier Middle School** site on Feb. 25, 2015. The

NAAQS and AQI monitors were not required by 40 CFR 58 Appendix D, the 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. The MCAQ sites and monitors are discussed in Appendix B to Volume 1. 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, the DAQ operates a seasonal ozone monitor. The site is shown in Figure C28. Monitoring information for the site is summarized in Table C4. Views looking north, northeast, east, southeast, south, southwest, west and northwest are provided in Figure C29 through Figure C36. The site was originally established in 1993 as the secondary downwind site for the Charlotte-Concord-Gastonia MSA. Today it provides valuable information on ozone concentrations in Lincoln County and could be useful for keeping parts of the county from being designated as in nonattainment with the ozone standard.



Figure C28. Crouse ozone monitoring site

		I CIUUD											
Crou	ise			A	AQS Si	ite Identifi	icat	tion Nu	mber	37-1	.09-0004		
1487	7 Rivervi	ew Road,	Lincoln	ton, Nort	th Caro	lina							
	iia-Conc	ord, NC-	SC		C	CBSA #:			16740				
	35.438	556	Longit	ude	-81.27	76750	50 Datum:			WGS84			
	270 me	eters											
ame	Metho	d		Meth	nod Re	ference ID)	Samp	le Duration	Sa	ampling Schedule		
	violet p	ohotometr		EQO	A-0880)-047		1-Hou					
Estab	lished:	Ozone								Ju	ly 1, 1993		
:	Rivervi	iew Road	Traf	fic Coun	it:	1400		Y	ear of Cou	nt:	2013		
ame	Distan	ce to Roa	d Dir	ection to	tion to Road		r T	Гуре	Statement	Statement of Purpo			
	62	meters		Southwe	est	SLAMS	5		-		NAAQS. Real-time & forecasting.		
					Suit	able for C	om	pariso	n				
ame	Monito	oring Obj	ective	Scale		to NAA	Q	Ŝ	Proposa	al to 1	Move or Change		
	Genera	l backgrou	und	Urban		Yes	5		Season 2017	will s	tart March 1 in		
ame				Meet	s Requ	irements o	of 4	0 CFR	Part 58				
	Ар	pendix A	<u>.</u>	Appen	Appendix C			Appendix D			Appendix E		
						Yes Yes							
	Crou 1487	Crouse 1487 Rivervi Charloi 35.438 270 me Metho Instrum violet p Established: Rivervi ame Distan 62 ame Monito Genera	Crouse 1487 Riverview Road, Charlotte-Gastor 35.438556 270 meters ame Method Instrumental with violet photometry Established: Ozone Riverview Road ame Distance to Roa 62 meters ame Monitoring Obj General backgro ame	1487 Riverview Road, Lincoln Charlotte-Gastonia-Conc 35.438556 Longitt 270 meters ame Method Instrumental with ultra violet photometry, 047 Established: Ozone : Riverview Road Trafame Distance to Road Director 62 meters General background ame Monitoring Objective General background Appendix A	CrouseA1487 Riverview Road, Lincolnton, NortCharlotte-Gastonia-Concord, NC-35.438556Longitude270 metersameMethodInstrumental with ultra violet photometry, 047KethodEstablished:OzoneCrestablished:OzoneRiverview RoadTraffic CountGeneral backgroundScaleGeneral backgroundUrbanAmeMonitoring ObjectiveGeneral backgroundUrbanAppendix AAppen	Crouse AQS Side 1487 Riverview Road, Lincolnton, North Caro Charlotte-Gastonia-Concord, NC-SC 35.438556 Longitude -81.2° 270 meters 270 meters ame Method Method Ref Instrumental with ultra violet photometry, 047 EQOA-0880 Established: Ozone Ozone i Riverview Road Traffic Count: ame Distance to Road Direction to Road 62 meters Southwest Suit ame Monitoring Objective Scale General background Urban Meets Require	AQS Site Identified1487 Riverview Road, Lincolnton, North CarolinaCharlotte-Gastonia-Concord, NC-SC35.438556Longitude-81.276750270 metersameMethodInstrumental with ultra violet photometry, 047Established:OzoneOzoneSouthwestSLAMS62 metersSouthwestSuitable for C ameMonitoring ObjectiveScaleGeneral backgroundUrbanYestAmeMonitoring ObjectiveSuitable Requirements	AQS Site Identification1487 Riverview Road, Lincolnton, North CarolinaCharlotte-Gastonia-Concord, NC-SCC 35.438556 Longitude -81.276750 D270 meters270 metersameMethodReference IDInstrumental with ultra violet photometry, 047EQOA-0880-047Established:OzoneOzoneInstrumental with ultra violet photometry, 0471400Established:OzoneGeneral backgroundDirection to RoadMonitor T62 metersSouthwestSLAMSGeneral backgroundUrban YesYes	AQS Site Identification Nu1487 Riverview Road, Lincolnton, North CarolinaCharlotte-Gastonia-Concord, NC-SCCBSA #:35.438556Longitude-81.276750270 meters270 metersameMethodMethod Reference IDSampInstrumental with ultra violet photometry, 047EQOA-0880-0471-HouEstablished:OzoneOzone1-HouYStance to RoadDirection to RoadMonitor TypeY62 metersSouthwestSLAMSSLAMSameMonitoring ObjectiveScaleto NAAQSGeneral backgroundUrbanYesameAppendix AAppendix CAppendix C	AQS Site Identification Number 1487 Riverview Road, Lincolnton, North Carolina Charlotte-Gastonia-Concord, NC-SC CBSA #: 35.438556 Longitude -81.276750 Datum: 270 meters -81.276750 Datum: Operation 270 meters Method Reference ID Sample Duration Instrumental with ultra violet photometry, 047 EQOA-0880-047 1-Hour Established: Ozone Statement Compliance Riverview Road Traffic Count: 1400 Year of Counting ame Monitoring Objective Southwest SLAMS AQI report ame Monitoring Objective Scale Suitable for Comparison to NAAQS Proposa ame Monitoring Objective Scale Yes 2017 ame Appendix A Appendix C Appendix D	Crouse AQS Site Identification Number 37-1 1487 Riverview Road, Lincolnton, North Carolina Charlotte-Gastonia-Concord, NC-SC CBSA #: 167- 35.438556 Longitude -81.276750 Datum: WG 270 meters		

Table C4. Site Table for Crouse

Table C4. Site Table for Crouse

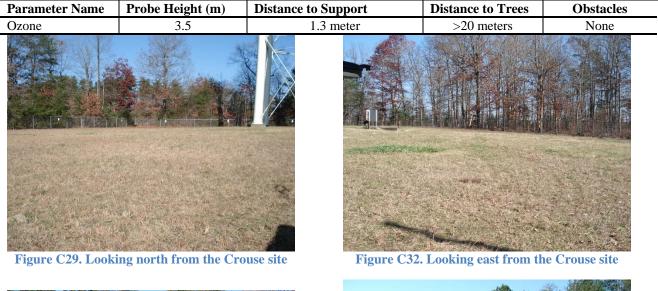




Figure C30. Looking northwest from the Crouse site



Figure C31. Looking northeast from the Crouse site



Figure C33. Looking west from the Crouse site



Figure C34. Looking southwest from the Crouse site



Figure C35. Looking southeast from the Crouse site



Figure C36. Looking south from the Crouse site

At **Rockwell** DAQ operates a year-round ozone monitor. The continuous fine particle nitrate monitor and aethalometer as well as a reactive-oxides-of-nitrogen monitor that operated year-round at this site were shut down in 2016. The DAQ operated these monitors to provide information for planning purposes and to evaluate state regulations. These monitors were not required by 40 CFR 58 Appendix D or any other EPA regulations. Due to staffing considerations, the age of the equipment and the decision that additional data provided by these monitors were not needed for planning purposes, the 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.

The one-in-three-day fine particle FRM monitor, one-in-six day collocated fine particle monitor and continuous fine particle monitor were shut down at the end of 2015. The one-in-six-day speciation fine particle monitors were shut down in January 2015 because the EPA stopped funding the sample analysis for them. Pictures of the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest are provided in Figure C37 through Figure C45. Monitoring information for the site is summarized in Table C5.



Figure C37. The Rockwell ozone site, 37-159-0021



Figure C38. Looking north from the Rockwell site



Figure C39. Looking northwest from the Rockwell site



Figure C40. Looking northeast from the Rockwell site



Figure C41. Looking east from the Rockwell site





Figure C43. Looking southwest from the Rockwell site



Figure C44. Looking southeast from the Rockwell site

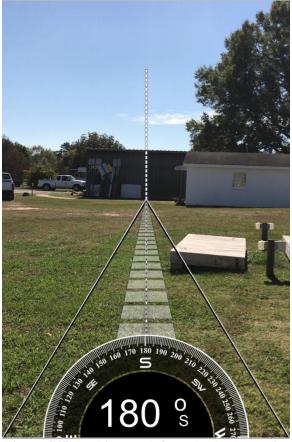


Figure C45. Looking south from the Rockwell site

Table C5. Site Ta			-	1 11	1.00		T 1			-	27.150		1
Site Name:			-	ckwell					ation Nu		37-159	9-002	21
Location:				6 West St	,	lockw	ell, N	lorth	Carolin	a			
CBSA:	Charl	lotte-Gastor	1ia-Coi	ncord, NC				CBS	SA #:		16740		
Latitude	35.55	1868	Longi	tude	-80.3	95039)	Dat	um:		WGS8	34	
Elevation	240 n	neters											
							Me	thod		Sam	ole	San	npling
Parameter Name	Meth	od					Ref	eren	ce ID	Dura			edule
		Instrument	al with	ultra viol	et								
Ozone		photometry	, 047				EQ	OA-0	880-047	7 1-Ho	ur	Yea	r-round
Date Monitor Establ	ished:	Ozone									Ap	ril 1	, 1993
Nearest Road:		Gold	Hill Ro	ad									
Traffic Count:		630					Year	r of C	Count:		2014		
		Dista	nce	Direction	l								
Parameter Name		to Ro	ad	to Road	Μ	onito	r Ty	ре	Staten	nent of P	urpose		
									Ozone	precurso	r monit	oring	z.
Ozone		17 me	eters	North	Sp	pecial	purp	ose	Compl	iance w/	NAAQ	5. M	odeling.
		Monit	oring					S	litable t	o Comp	are 1	Prop	osal to
Parameter Name		Objec			Scal	e		to	NAAQ	S	1	Mov	e or Change
Ozone		Highe	st conc	entration	Urba	an				Yes]	None	;
						Ν	Aeets	Par	t 58 Rec	Juiremer	nts for:		
Parameter Name				Appen	dix A	Ap	pend	lix C		Appendi	ix D	1	Appendix E
Ozone				Ye	s		Y	Yes		No requ	irement	s	Yes
Parameter Name			Prob	e Height ((m)	Dista	nce t	o Su	pport	Distanc	e to Tr	ees	Obstacles
Ozone				3.5			1.1 n	neter	s	> 20) meters		None

Table C5. Site Table for Rockwell

At the **Monroe Middle School** site, the DAQ operates a seasonal ozone monitor. Figure C46 shows the site. Table C6 summarizes monitoring information for the site. Figure C47 through Figure C50 provide views looking north, east, south and west. This ozone-monitoring site is one of six for the MSA. 40 CFR 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. The DAQ has investigated moving the site to another part of Monroe; however, this site meets the siting criteria in 40 CFR 58 Appendix E better than any nearby alternative location. The DAQ has also added a fence on the roof of the building between the probe and soccer field to protect the probe.



Figure C46. Monroe ozone monitoring site, 37-179-0003

Table C6. Site Table for Monroe Middle School

Site Name:	Monroe	Middl	e School			AOS S	ite Ide	ntificatio	n Nu	mber	37-179-00	03
Location:	701 Char	les Stre	eet, Monroe	e, North C		<u> </u>						
CBSA: Charlotte-Gastonia-Concord, NC-SC								CBSA #	#:		16740	
Latitude	titude 34.973889 Longitude -80.540833 Datum:							WGS84				
Elevation		184 n	neters									
Parameter	Name	Meth	od		Metho	d Refe	ence Il	D Samp	ole D	uration	Samplin	g Schedule
Ozone			mental wit		EQOA	-0880-()47	1-Hou	ur		March 1	to Oct. 31
Date Monit	or Establi	ished:	Ozone								April 7, 19	99
Nearest Ro	ad:	Charles	s Street		Traff	ic Cou	nt: 5	5100	Yea	r of Cou	nt:	2014
Parameter	Name	Distan	ce to Road	Direc	tion to I	Road	Monit	tor Type	St	atement	of Purpose	9
Ozone		71.	3 meters		West		Specia Purpo				e w/NAAQ ing & forec	S. Real-time asting.
Parameter		Monit	oring				Suitat	ole for				
Name		Objec	ctive	Sca	ale	Com	parison	n to NAA	QS	Proposa	al to Move	or Change
Ozone	Pop	ulation	Exposure	Neighb	orhood		Y	es		None		

Parameter Name	Meets Part 58 Appendix A Requirements	Meets Part 58 Appendix C Requirements	Meets Pa Require	art 58 Appendix D ments	Meets Part 58 Appendix E Requirements
Ozone	Yes	Yes		Yes	Yes
Parameter Name	Probe Height (m)	Distance to Support		Distance to Trees	Obstacles
Ozone	3.9	1 meter		>20 meters	None

Table C6. Site Table for Monroe Middle School



Figure C47. Looking north from the Monroe site



Figure C48. Looking east from the Monroe site





Figure C49. Looking west from the Monroe site

Figure C50. Looking south from the Monroe site

The DAQ continues to operate the Monroe site because it provides valuable information for developing nonattainment boundaries and has been used in the past to keep parts of Union County from being designated as 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 and began monitoring at that site for lead in the ambient air Dec. 27, 2011. This lead monitoring ended on April 30, 2016, when new monitoring regulations became effective.²

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 58 Appendix D for population exposure monitoring in urban areas. Seasonal ozone monitoring will start on March 1 instead of April 1 beginning in 2017.

The 2010 **nitrogen dioxide** monitoring requirements required additional monitoring in the Charlotte-Gastonia-Concord MSA. The MSA is required to have an area-wide monitor starting in 2013 and a near-roadway monitor starting in 2014. The 2010 **sulfur dioxide** monitoring

² 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 <u>https://www.gpo.gov/fdsys/pkg/FR-2016-03-28/pdf/2016-06226.pdf</u>.

requirements also required additional monitoring in the Charlotte-Gastonia-Concord MSA. This MSA was required to have two population-weighted emission index, PWEI, monitors within the MSA because there were large sources of sulfur dioxide as well as large numbers of people in the MSA. 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 result in only one PWEI monitor being required. Thus, the York sulfur dioxide monitor was shut down in June 2014. 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 micropolitan statistical area is in Stanly County. The 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 more monitoring in this area. This area does not have any MSAs requiring a minimum number of monitors by 40 CFR 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 populational monitors in this area because the populational monitors in this area because the population is too small.

Appendix C.1 Annual Network Site Review Forms for 2016

Taylorsville-Liledoun

Lenoir

Hickory

Crouse

Rockwell

Monroe Middle School in Monroe

Region <u>MRO</u> Site N	IRO Site Name Taylorsville Liledoun		AQS Site # 37- <u>003-0005</u>			
Street Address-700 Liledoun R	oad		City <u>Taylorsville</u>			
Urban Area Not in an Urban	Area Core-base	d Statistical Area Hici	kory-Lenoir-Morganton, NC			
Enter E						
Longitude <u>-81.1910</u>	Latitude <u>35.913</u>		hod of Measuring			
In Decimal Degrees	In Decimal Degrees	Other (explain)	Explanation: <u>Google Maps</u>			
Elevation Above/below Mean Sea Level (in meters) 362						
Name of nearest road to inlet probe	A AC MC		14			
Comments: <u>Used http://www.ncdc</u>						
Distance of site to nearest major roa	8 8	1000	1 <u>SW</u>			
Name of nearest major road <u>HWY</u>	<u>64</u> ADT <u>9500</u> Year <u>201</u>	<u>5</u>				
Comments: Used http://www.ncdot	.gov/travel/statemapping/tr	afficvolumemaps				
Site located near electrical substatio	n/high voltage power lines'	?	Yes 🗌 No 🗙			
Distance of site to nearest railroa		(m) <u>2152</u>	Direction to RR <u>NE</u> NA			
OPTIONAL Distance of site			(m) <u>221</u> Direction <u>SE</u>			
Distance between site and drip line		Direction from site to water				
Explain any sources of potential	and the second		stacks, vents, railroad tracks,			
construction activities, fast food	restaurants, and swimmi	ng pools.				
None Noted						
ANSWER ALL APPLICABLE Q	UESTIONS.					
	Ionitoring Objective	Scale	Monitor Type			
			70			
$ SO_2(N \Delta\Delta OS) =$	eral/Background	Micro	SLAMS			
\square SO ₂ (trace-level) \square High	hest Concentration	Middle	SPM			
	CO3 Concentration		Monitor Network			
	ulation Exposure		Affiliation			
\square O_3 \square O_3 \square O_3	rce Oriented	Neighborhood	NCORE			
Hydrocarbon	nsport	Urban				
	vind Background	Regional	Unofficial PAMS			
CO (trace-level)	fare Related Impacts					
		70 70				
Probe inlet height (from ground) 2-			ight from ground (meters) <u>3.65</u>			
Distance of outer edge of probe inle	et from horizontal (wall) ar	nd/or vertical (roof) supportir	ng structure > 1 m? Yes \bowtie No			
Actual measured distance from out	er edge of probe to support	ing structure (meters) 1.06				
Actual measured distance from outer edge of probe to supporting structure (meters) <u>1.06</u> Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes X No NA						
Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes X No NA I Is probe > 20 m from the nearest tree drip line? Yes X *No (answer *'d questions)						
*Is probe > 10 m from the nearest tree drip line? Yes \square *No \square						
*Distance from probe to tree (m) Are there any obstacles to air flow?	Direction from prob	be to tree *Height of tr	ee (m)			

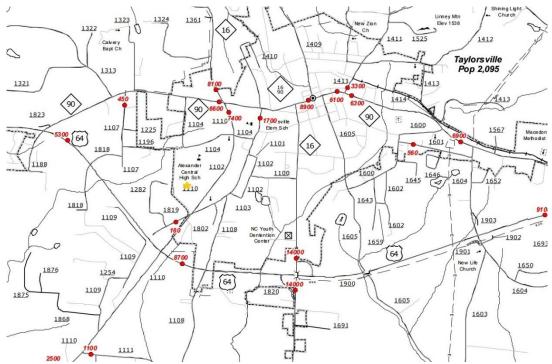
Site Information

Taylorsville Liledoun Site Review 2016

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes No Distance of probe to nearest traffic lane (m) 219 Direction from probe to nearest traffic lane SE

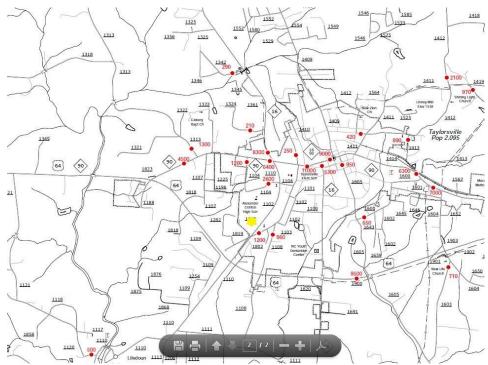
Parameters	Monitoring Objective	Scale	Site Type
NA NA	General/Background	Micro	SLAMS
Air flow < 200 L/min □ PM2.5 FRM	Highest Concentration	Middle	SPM
PM10 FRM	Population Exposure	Neighborhood	Monitor Network Affiliation
PM10 Cont. (BAM)	Source Oriented	Urban	NCORE
PM10-2.5 FRM PM10-2.5 BAM	Transport	Regional	
PM10 Lead (PB)	Welfare Related Impacts		SUPPLEMENTAL
$\square PM2.5 Cont. (BAM)$	wenale Related impacts		SPECIATION
PM2.5 Spec. (SASS) PM2.5 Spec. (URG)			Monitor NAAQS Exclusion
PM2.5 Cont. Spec.			NONREGULATORY
		n 🗌 7-15 m	≥ 15 m
	e from probe inlet to ground (meters)	S. Stranger (1997)	
	probe inlet from horizontal (wall) as from outer edge of probe inlet to su		
	ter edge of probe inlets of any low vo		ar internet internet
low volume monitor at th		1. 1 17 17 1 7	Yes No NA
or TSP inlet = 2 m or gre			² M-10 Yes No NA X
TEOM, BAM & TEOM)		*Yes ∐ (an	swer *'d questions) No 🛛 NA 🗌
	collocated PM 2.5 samplers (X) with		
each other? *Are collocated PM2.5 st	ampler inlets within 1 m vertically o		No Give actual (meters) No Give actual (meters)
Is an URG 3000 monitor	collocated with a SASS monitor at t	he site? *Yes \square (answe	$r *'d$ questions) No \square NA \blacksquare
	collocated speciation samplers inlets	(X) within 2 to $\overline{4}$ m of eac	h other? Yes 🗋 No 🗍
Give actual (meters)*	on sampler inlets within 1 m vertical	lv of each other? Ves	No \square Give actual (meters)
Is a low-volume PM10 m	onitor collocated with a PM2.5 mon	iter at the	answer *'d questions) No 🛛 NA
site to measure PM10-2.5			
* Entire inlet opening of within 2 to 4 m of each o	collocated PM10 and PM2.5sampler	s for PM10-2.5 (X)	Yes 🗌 No 🗌
	nd PM2.5 sampler inlets within 1 m v	vertically of each other?	Yes 🗌 No 🗌
	nearest tree drip line? Yes 🛛 '		
*Is probe > 10 m from th	e nearest tree drip line? Yes 🔲 📍	*No 🗌	
*Distance from probe to	tree (m) Direction from pro	be to tree*Height of	tree (m)
122	o air flow? *Yes 🗌 (answer *'d que		
	Distance from probe inlet (m) obe to obstacle at least twice the height		
	est traffic lane (m) 219 Direction		
RECOMMENDATIONS:			
1) Maintain current site s		*'d questions)	
*2) Change monitoring of	bjective? Yes 🗌 (enter new objec	tive) No 🔲-	
*3) Change scale of repre			
*4) Relocate site? Yes	□ No □		
Comments: PM10 BAM	start-up was 3/23/2016. This monito	or will operate through 4/1/	2017
Date of Last Site Pictures	10/28/2016 New Pictures Submitt	ed? Yes 🛛 No 🗌	
Reviewer Sandra Sherer			Date October 28, 2016
Ambient Monitoring Coor	rdinator D. Manning		Date11/26/2016
anoione monitoring COO			Daw <u>11,20/2010</u>

Taylorsville Liledoun Site Review 2016



2014 Annual Average Daily Traffic, AADT, star represents location of the Taylorsville-Liledoun monitoring station

AADT obtained from the North Carolina Department of Transportation Traffic Survey Unit



2015 Annual Average Daily Traffic, AADT, star represents location of the Taylorsville-Liledoun monitoring station

AADT obtained from the North Carolina Department of Transportation Traffic Survey Unit

Region ARC	Site N	ame <u>LENC</u>	<u> IR</u>		AQ	S Site # 37- <u>027</u> - <u>0003</u>
Street Addre	ss-291 Nuway	Circle		City	<u>Lenoir</u>	
Urban Area	Not in an Urbar	n Area	Core-based Sta	tistical	Area N	None
	Enter E	xact				
Longitude	<u>-81.530614</u>	Latitude				
			<u>35.935934</u>		Μ	ethod of Measuring
In Decimal D	egrees	In Decima	al Degrees		Explan	nation: <u>Google Earth</u>
Elevation Ab	ove/below Mear	1 Sea Level	(in meters)			<u>372</u>
Contraction of the second s	est road to inlet NCDOT Traffic	-	And the second s	<u>500</u> Y	lear Cho	pose an item <u>2015</u>
Distance of si	te to nearest ma	jor road (m) <u>146.00</u> Direc			nearest major road <u>E</u>
	est major road NCDOT Traffic			ar Cho	ose an it	em <u>2015</u>
Site located n	ear electrical su	bstation/hig	sh voltage powe	r lines?		Yes 🗙 No
Distance of si	te to nearest rai	lroad track	(m)	<u>1016</u>	Dire	ction to RR <u>WSW</u> NA
OPTIONA	L Distance of	site to near	rest power pole	w/trans	former	(m) <u>73</u> Direction <u>ENE</u>
Distance betwe	en site and drip l	ine of water	tower (m)	Direc	tion from	site to water tower NA
Explain any s	ources of potent	tial bias; inc	clude cultivated	fields,	loose bul	k storage, stacks, vents, railroad
tracks, constr	uction activities	, fast food r	estaurants, and	swimm	ing pools	5.

Site Information

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
⊠ Ozone (O₃)	General/Background Highest Concentration Max O3 Concentration Population Exposure Source Oriented Transport Upwind Background Welfare Related Impacts	☐ Micro ☐ Middle ☐ Neighborhood ☐ Urban ⊠ Regional	⊠SLAMS □SPM
Probe inlet height (fi	rom ground) 2-15 m? Yes 🛛 No 🔲 🛛 Giv	e actual measured height fro	om ground (meters) 4.42
	ge of probe inlet from horizontal (wall) and/or ver tance from outer edge of probe to supporting struc		ture > 1 m? Yes 🔀 No \square
	ge of probe inlet from other gas monitoring probe		Yes 🛛 No 🗌 NA 🗌
Is probe > 20 m from	n the nearest tree drip line? Yes 🛛 *No 🗌 (answer *'d questions)	
*Is probe > 10 m fro	m the nearest tree drip line? Yes 🗌 *No 🗌		
*Distance from prob	be to tree (m) Direction from probe to tree	e *Height of tree (m)	
Are there any obstac	eles to air flow? *Yes 🔲 (answer *'d questions) N	Io 🛛	
*Identify obstacle _	Distance from probe inlet (m)Direc	tion from probe inlet to obst	acle
*Is distance from init	et probe to obstacle at least twice the height that t	he obstacle protrudes above	the probe? Yes 🗌 No 🔲
Distance of probe to	nearest traffic lane (m) 146 Direction from pro	be to nearest traffic lane \underline{E}	

LENOIR & SO2 SITE REVIEW 2016LENOIR & SO2 SITE REVIEW 2016

0701	1 (O) THOD	DDOOL 0		TTOTO
OZONE	MONITOR	RECOM	VIENDF	ATIONS:

- 1) Maintain current monitor 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 monitor? Yes 🗌 No 🗌

Comments:

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type		
⊠ SO₂(NAAQS) □ SO₂(trace-level)	General/Background Highest Concentration Population Exposure Source Oriented Transport Upwind Background Welfare Related Impacts	☐ Micro ☐ Middle ☐ Neighborhood ⊠ Urban ☐ Regional	SLAMS SPM		
Probe inlet height (from g	round) 2-15 m? Yes 🛛 No 🗌 🛛 Give	e actual measured height from	m ground (meters) <u>4.485</u>		
5	probe inlet from horizontal (wall) and/or ver from outer edge of probe to supporting struc		ture >1 m? Yes 🛛 No 🗌		
Distance of outer edge of	probe inlet from other monitoring probe inle	ts > 1 m?	Yes 🛛 No 🗌 NA 🗌		
Is probe > 20 m from the r	nearest tree drip line? 🛛 Yes 🔀 🛛 *No 🔲 (answer *'d questions)			
*Is probe > 10 m from the nearest tree drip line? Yes *No *No ** *Distance from probe to tree (m) Direction from probe to tree *Height of tree (m)					
Are there any obstacles to air flow? *Yes 🗌 (answer *'d questions) No 🛛					
*Is distance from inlet pro	Distance from probe inlet (m)Direc be to obstacle at least twice the height that t st traffic lane (m) <u>146</u> Direction from pro	he obstacle protrudes above			

SULFUR DIOXIDE MONITOR RECOMMENDATIONS:	
1) Maintain current monitor 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 monitor? Yes 🗌 No 🗌	
Comments:	
Date of Last Site Pictures 10/10/16 New Pictures Submitted? Yes 🛛 No 🗌	
Reviewer <u>Terri Davis</u>	Date <u>December 13, 2016</u>
Ambient Monitoring Coordinator Steve Ensley	Date <u>1/19/17</u>
Revised 2017-01-19	

LENOIR & SO2 SITE REVIEW 2016LENOIR & SO2 SITE REVIEW 2016

Region_MRO	Region <u>MRO</u> Site Name <u>Hickory</u>				AQS Site # 37-035-0004		
Street Addres	s <u>-1st Ave. SW at</u>	15th St. SW		City Hickor	ry		
Urban Area	HICKORY		Core-based Sta	itistical Area	Hickory-Lenoi	r-Morganton, NC	
	Enter E	Cxact					
Longitude	<u>81.3657</u>	Latitude	35.7289		Method of Me	easuring	
In Decimal De	grees	In Decima	l Degrees	Other (expl	<u>ain)</u> Explanati	ion: <u>Google maps</u>	
Elevation Abo	ve/below Mean S	ea Level (in	meters)		342.90		
Name of neare	st road to inlet pr	obe <u>2nd Ave</u>	<u>. SW</u> AD	Γ Choose an It	em <u>3400</u> Year	2013	
Distance of oz	one probe to near	est traffic la	ne (m) 22 Directio	on from inlet to	nearest traffic la	ane SSE	
Comments: U	sed http://www.n	cdot.gov/trav	vel/statemapping/	trafficvolumen	naps/.		
Name of neare	st major road <u>H</u>	<u>WY 321</u> AD	T <u>37000</u> Year (Choose an item	2013		
Distance of sit	e to nearest major	road (m) <u>1</u>	62.45 Direction f	from site to nea	rest major road	<u>ENE</u>	
Comments: U	sed http://www.n	cdot.gov/trav	vel/statemapping/	trafficvolumen	naps/.		
Site located ne	ar electrical subst	ation/high v	oltage power line	s?		Yes 🛛 No 🗌	
Distance of sit	e to nearest railro	ad track	(m)	227Direction	to RR <u>N</u>	NA	
**OPTIONAL	** Distance of si	te to nearest	power pole w/tra	nsformer	(m) 32 Direction	n <u>E</u>	
Distance betw	een site and drip l	ine of water	tower (m) <u>15</u> Dir	ection from sit	e to water tower	NW NA	
Evolain any ac	urces of potential	bias: includ	e cultivated field	s. loose bulk st	orage, stacks, ver	nts railroad tracks	
	tivities, fast food				0, ,		

Site Information

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 within a county that is part of a metropolitan statistical area (MISA) or a micropolitan statistical area (MISA), then it is located within a core-based statistical area. If the monitoring station is located in a county included in a MSA or MISA, select the appropriate CBSA from the list. Otherwise select "None".

Longitude and Latitude: The longitude and latitude should be entered in decimal degrees. Use a conversion program, such as http://transition.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html, to convert to decimal degrees. Road Information: For the nearest road to the inlet probe, list whatever roadway that carries vehicles that is closest to the probe, whether or not it is a named or public road and even if the road has very little traffic. Use the comments space if necessary 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 as well as the AADT if it is 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 as well as 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 any information about the site that is not requested elsewhere. Especially note any changes to the site 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		Micro	SLAMS <u>PM2.5 FRMs</u>			
PM2.5 FRM PM10 FRM	General/Background		SPM_BAM 1020 & 1022			
PM10 FRM	Highest Concentration	Middle				
PM10-2.5 FRM	Population Exposure		Nonregulatory			
PM10-2.5 BAM	Source Oriented	Neighborhood	Supplemental Speciation			
$\square PM10 Lead (PB)$	Transport	Urban				
PM2.5 Cont. (BAM) PM2.5 Spec. (SASS)	Welfare Related Impacts	Regional				
\square PM2.5 Spec. (URG)						
PM2.5 Cont. Spec.						
-	n ground) $\Box \leq 2 \text{ m} $					
	ice from probe inlet to ground (meters) <u>HC 2.3368, H</u>	<u>HCA 2.3622, HK BAM</u>			
<u>2.5146, HK 1022 BAM</u>						
	of probe inlet from horizontal (wall) and/or vertical (platform or roof)			
supporting structure >2						
	ice from outer edge of probe inl		ture (meters) <u>HC 2.0574,</u>			
	<u>M 2.159, HK 1022 BAM 2.108</u>					
	outer edge of probe inlets of any		Yes 🛛 No 🗌 NA 🗌			
	low volume monitor at the site	-				
	outer edge of all low volume mo	onitor inlets and any	Yes 🗌 No 🗌 NA 🛛			
	$\frac{\text{(SP inlet} = 2 \text{ m or greater})}{\text{(TE PD) (a)}}$					
	Monitors (Two FRMs, FRM &	BAM, FKM *Yes	(answer *'d questions)			
& TEOM, BAM & TEO	of collocated PM 2.5 samplers	$V_{\alpha\alpha} \square N_{\alpha} \square G$	No NA NA ve actual (meters): <u>HC and</u>			
(X) within 2 to 4 m of e			and HK 1022=3.1242			
	sampler inlets within 1 m		ve actual (meters): <u>HC and</u>			
vertically of each other			<u>and HK 1022=0.3048</u>			
	· or collocated with a SASS mon					
is an erre sooo mome			$\log \prod NA \boxtimes$			
* Entire inlet opening of	collocated speciation samplers inle					
Give actual (meters)						
* Are collocated specia	tion sampler inlets within 1 m	vertically of each othe	r? Yes 🗌 No 🗌			
Give actual (meters)						
THE REPORT OF THE DRIVER WERE ALL AND ADDRESS AND ADDR	monitor collocated with a PM2	2.5 monitor *Yes	(answer *'d questions)			
at the site to measure P			No 🗌 NA 🛛			
* Entire inlet opening of collocated PM10 and PM2.5samplers for PM10-2.5 (X) Yes No						
within 2 to 4 m of each other?						
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each Yes No						
other? $1 > 20 = 6 = 41$	ne nearest tree drip line? Yes					
		—	r *'d questions)			
		es 🔲 *No 🗌				
*Distance from probe t		om probe to tree	*Height of tree (m)			
Are there any obstacles	to air flow? *Yes 🗌 (answer	*'d questions) No 🛛				
	Distance from probe inlet (m)	Direction from prob	be inlet to obstacle			
*Is distance from inlet prob	e to obstacle at least twice the height	that the obstacle protrudes	above the probe? Yes 🗌 No 🗌			

RE	CC	OM	MENI	DATI	ONS:
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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	
<u>Comments:</u> PM2.5 BAM 1020 shut down on 7/7/2016	
Date of Last Site Pictures: <u>December 4, 2015</u> New Pictures Submitted? Yes No	
Reviewer Sandra Sherer Date: October 28, 201	<u>16</u>

Instructions (continued):

Ambient Monitoring Coordinator D. Manning

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.

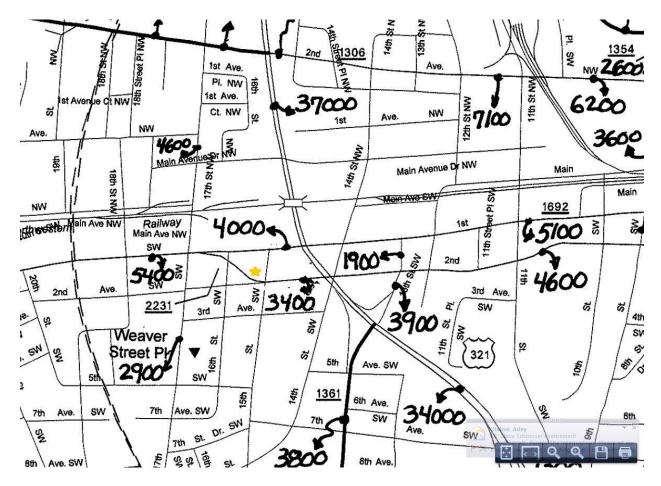
Check the site picture archive to find out when the last set of site pictures were taken and write the date down on the line. If the pictures are more than five years old or if something at the site has changed in the past year, take new site pictures. Changes that require new site pictures include additions, 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.

Hickory Site Review 2016

Date: November 26, 2016



2013 Annual Average Daily Traffic, AADT, star represents location of the Hickory monitoring station AADT obtained from the North Carolina Department of Transportation Traffic Survey Unit

Region MRO	Site Na	ne <u>Crouse</u>		AQS Sit	e # 37- <u>109-0004</u>	
Street Address-1487	Riverview R	oad		City Lincolnton		
Urban Area Not	in an Urban Aı	ea C	Core-based Statis	stical Area Lincol	nton, NC	
	Enter Ex			1		
	.2767	Latitude	<u>35.4385</u>		l of Measuring	
In Decimal Degrees		In Decimal D		Explanatio	on: <u>Google Maps</u>	
Elevation Above/belo					267.00	
Name of nearest road	l to inlet probe	Riverview Ro	ad ADT 220	<u>)0</u> Year latest availal	ble 2015	
Distance of ozone pro	obe to nearest	traffic lane (m)	62 Direction from	m ozone probe to nea	rest traffic lane <u>SW</u>	
Comments: Used wy	vw.ncdot.gov/1	ravel/statemap	ping/trafficvolun	ne maps/		
Name of nearest maj	or road <u>W. H</u>	wy 150 ADT	<u>8200</u> Year latest	available 2015		
Distance of site to ne	arest major roa	ud (m) <u>78.00</u> I	Direction from sit	te to nearest major roa	ad <u>N</u>	
Comments: Used wy	ww.ncdot.gov/	ravel/statemap	ping/traffic volu	me maps/		
Site located near elec	trical substatio	n/high voltage	power lines?		Yes 🗌 No 🛛	
Distance of site to ne					ection to RR \underline{W} \Box NA	
OPTIONAL Dis					(m) <u>52</u> Direction <u>SW</u>	
Distance between site						
				e bulk storage, stacks	s, vents, railroad tracks,	
construction activitie	s, fast food res	taurants, and sy	wimming pools.			
none noted						
ANSWER ALL APPI	LICABLE QUI	ESTIONS:				
Parameters		ng Objective		Scale	Site Type	
\square O ₃	⊠General/B		Micro		SLAMS	
		oncentration				
	second converses in the second second	oncentration	Middle		SPM	
	Population		Neighb	orhood		
	Source Or	iented				
	Upwind B		Region	al		
		elated Impact				
Probe inlet height (•		and the second sec			
Give actual measur	ed height from	n ground (me	ters) <u>3.50</u>			

Site Information

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting

structure $> 1 \text{ m}$? Yes \boxtimes No
Actual measured distance from outer edge of probe to supporting structure (meters) 1.30
Is probe > 20 m from the nearest tree drip line? Yes \times *No \square (answer *'d questions)
*Is probe > 10 m from the nearest tree drip line? Yes : *No :
*Distance from probe to tree (m) Direction from probe to tree *Height of tree (m)
Are there any obstacles to air flow? *Yes 🗌 (answer *'d questions) No 🛛

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle _____ *Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ____No ____

Crouse Site Review 2016

Revised 2017-04-294

1

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
Comments: None
Date of Last Site Pictures: December 8, 2015 New Pictures Submitted? Yes No

Reviewer Robert Jay Papuga	Date: <u>12/20/2016</u>
Ambient Monitoring Coordinator D. Manning	Date: <u>12/29/2016</u>

Instructions:

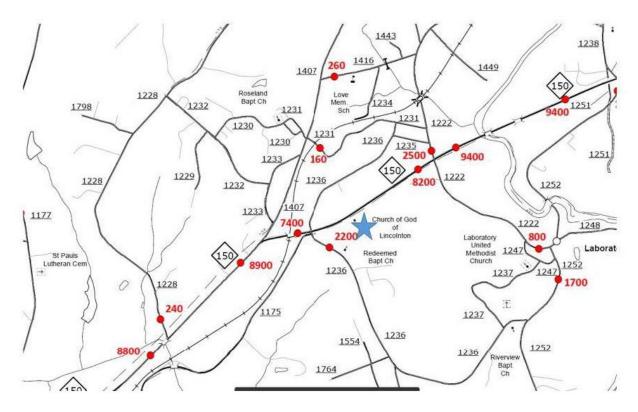
If the annual network review has indicated that the monitoring objectives and scale of representativeness for the site have not changed and the siting criteria still meets those monitoring objectives and that scale of representativeness and there are no other reasons to modify the site in any way, check "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.



2015 Annual Average Daily Traffic, AADT, star represents location of the Crouse monitoring station AADT obtained from the North Carolina Department of Transportation Traffic Survey Unit

Region MRO	gion_MRO Site Name Monroe Middle School				AQS Site	# 37- <u>179</u> -00	03
Street Address-701 Charles Street			City Monroe				
Urban Area MONRO	E		Core-based Stati	stical Area	Charlott	e-Gastonia-G	Concord, NC-
	Enter E	vact	50	1			
Longitude -80.541	CHOICE AND COLOR AND AND	Latitude	34.9739	1	Method o	of Measurin	ıg
In Decimal Degrees		In Decima	Degrees	· · · · · · · · · · · · · · · · · · ·	Explanation	: Google M	laps
Elevation Above/below N	lean Sea l	Level (in me	ters)		1	84.00	
Name of nearest road to in	nlet probe	Charles Str	reet ADT 51	<u>00</u> Year 1a	test available	e <u>2014</u>	
Distance of ozone probe t	o nearest	traffic lane (m) <u>71</u> Direction fro	m ozone p	robe to neare	est traffic lan	ne <u>W</u>
Comments: Used www.ncdot.gov/travel/statemapping/trafficvolumemaps							
Name of nearest major road <u>Highway 74/601</u> ADT <u>57000</u> Year latest available <u>2015</u>							
Distance of site to nearest major road (m) <u>1548.00</u> Direction from site to nearest major road <u>ENE</u>							
Comments: Used www.ncdot.gov/travel/statemapping/trafficvolumemaps							
Site located near electrica	l substatio	n/high volta	ige power lines?			Yes	No 🛛
Distance of site to nearest railroad track (m) <u>967</u> Direction to RR <u>NE</u> NA							
OPTIONAL Distance of site to nearest power pole w/transformer (m) <u>30</u> Direction <u>NE</u>							
Distance between site and drip line of water tower (m) Direction from site to water tower NA							
Explain any sources of po construction activities, fas				se bulk stor	rage, stacks,	vents, railro	ad tracks,
none noted							

Site Information

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Site Type			
\bigcirc O ₃	General/Background	Micro	SLAMS			
	Highest Concentration Max O3 Concentration	Middle	 ∏SPM			
	Population Exposure	Neighborhood				
	Source Oriented	Urban				
	Upwind Background Welfare Related Impacts	Regional				
Probe inlet height (from ground) 2-15 m? Yes 🛛 No						
Give actual measu	Give actual measured height from ground (meters) 3.90					
Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting						
structure $> 1 \text{ m}$? Yes \bigtriangledown No \square						
Actual measured distance from outer edge of probe to supporting structure (meters) 1.00						
Is probe > 20 m from the nearest tree drip line? Yes \times *No (answer *'d questions)						
*Is probe > 10 m from the nearest tree drip line? Yes : *No :						
*Distance from probe to tree (m) Direction from probe to tree *Height of tree (m)						
Are there any obstacles to air flow? *Yes 🗌 (answer *'d questions) No 🛛						
	Distance from probe inlet (m					

Monroe Site Review 2016

Revised 2017-01-034

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
Comments: Please update "site type" in AQS from SPM to SLAMS
Date of Last Site Pictures: <u>November 29, 2016</u> New Pictures Submitted? Yes No
Reviewer Robert Jay PapugaDate: 11/29/2016

Ambient Monitoring Coordinator	D. Manning	Date: January 3	3, 2017
•			

Instructions:

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.

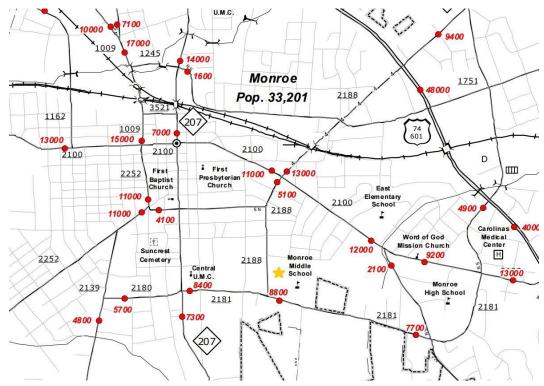
If the annual network review has indicated that the monitoring objectives, scale of representativeness, or siting criteria have changed for some reason or there is another reason to modify the site in some way, check "No" to the question "Maintain current site status?" and complete the rest of the recommendations 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.

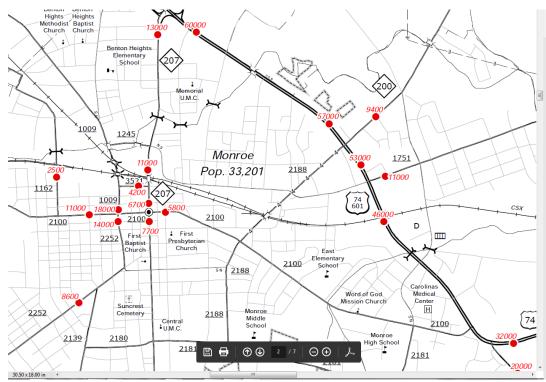
Pictures of the site should at a minimum include at least one picture showing the site itself and pictures standing at the probe or inlet or as close as possible to the probe or inlet looking in the four compass directions (north, east, south, and west). If meteorological data are collected at the site,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

Monroe Site Review 2016



2014 Annual Average Daily Traffic, AADT, star represents location of the Monroe monitoring station AADT obtained from the North Carolina Department of Transportation Traffic Survey Unit



2015 Annual Average Daily Traffic, AADT, star represents location of the Monroe monitoring station AADT obtained from the North Carolina Department of Transportation Traffic Survey Unit

Region_MRO Site Name Rockwell			AQS	Site # 37- <u>159</u> - <u>0021</u>		
				City <u>Rockwell</u>		
Urban Area Not in an Urban Area Core-based Sta				Statis	stical Area Sali	sbury, NC
Enter Exact						
L'ungitude _	<u>.80.3953</u>	Latitude		9		od of Measuring
In Decimal Degrees		In Decimal			Ex	planation: <u>Google Maps</u>
Elevation Above/be						234
Name of nearest road	o inlet probe	Gold Hill Roa	ad ADT <u>630</u> Y	'ear Cl	hoose an item 201.	<u>4</u>
Comments: <u>Used ww</u>	w.ncdot.gov/tr	avel/statemap	ping/trafficvolu	imema	ps	
Distance of site to nea					nearest major road	<u>S</u>
Name of nearest major	road <u>Highwa</u>	ay 52 ADT [7800 Year 201	.4		
Comments: Used ww	w.ncdot.gov/tr	avel/statemap	ping/trafficvolu	umema	<u>ps</u>	
Site located near elect	rical substation	high voltage	power lines?			Yes 🗌 No 🗙
Distance of site to n						<u>7</u> Direction to RR <u>SW</u> NA
OPTIONAL D						(m) <u>39</u> Direction <u>NW</u>
Distance between site					n from site to water	
Explain any sources construction activitie	terra a seconda da seconda da seconda da se	and a second sec			A REAL PROPERTY AND A REAL PROPERTY AND A REAL PROPERTY AND	tacks, vents, railroad tracks,
	25, 105t 100d 1	cotauranto, a	ing swinning	poors	•	
None Noted		-				
ANSWER ALL APP	LICABLE Q	UESTIONS:				
Parameters	M	onitoring Ob	ojective		Scale	Monitor Type
🗖 NA	Gene	ral/Backgrou	nd	Пм	licro	SLAMS <u>03</u>
\Box SO ₂ (NAAQS)	MILLink	est Concentra	1.0	-		
$ \square SO_2 (trace-leve) \\ \square NO_2 (NAAQS) $		O3 Concentra			fiddle	SPM <u>HSNOy</u>
$\square \operatorname{NO}_2(\operatorname{NAAQS})$ $\square \operatorname{HSNO}_2$	HSNOy					Monitor Network
$\square O_3$		lation Exposi	ire	Neigl	hborhood	Affiliation
NH ₃		ce Oriented			rban	NCORE
Hydrocarbon		and a second second second second	-			Unofficial PAMS
Air Toxics		sport		R	egional	
CO (trace-level		ind Backgrou	and the second se			
		are Related II	npacts			
Probe inlet height (from ground) 2-15 m? Yes 🛛 No 🗌 Give actual measured height from ground (meters) 3.50						
Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure $> 1 \text{ m}$? Yes Δ No \Box						
Actual measured distance from outer edge of probe to supporting structure (meters) <u>1.10</u>						
Distance of outer edge of probe inlet from other monitoring probe inlets $> 1 \text{ m}$? Yes \bigtriangledown No \square NA \square						
Is probe > 20 m from the nearest tree drip line? Yes X *No (answer *'d questions)						
*Is probe > 10 m from the nearest tree drip line? Yes \square *No \square						
*Distance from probe to tree (m) Direction from probe to tree *Height of tree (m)						
Are there any obstacles to air flow? *Yes [] (answer *'d questions) No 🛛						
*Identify obstacle Distance from probe inlet (m) Direction from probe inlet to obstacle						
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes \square No \square						

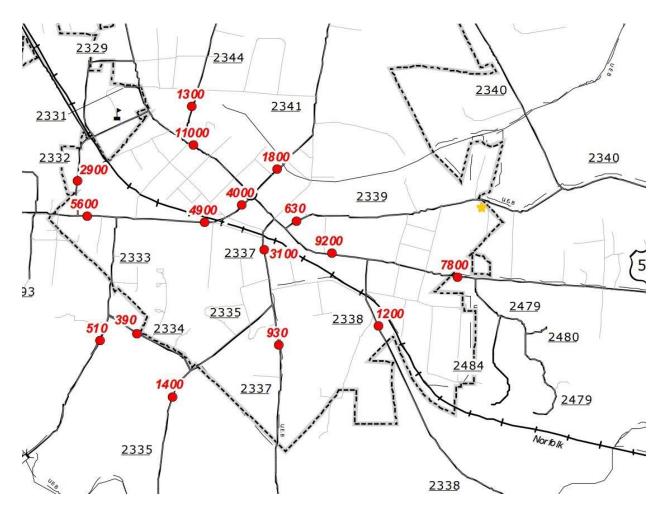
Site Information

Rockwell Site Review 2016

Distance of probe to nearest traffic lane (m) $\underline{17}$ Direction from probe to nearest traffic lane \underline{N}

Parameters	Monitoring Objective	Scale		Site Type		
NA	General/Background	Micro	SLAMS			
Air flow < 200 L/min □ PM2.5 FRM	Highest Concentration	Middle	3	- Cont. Spec. (aethalometer),		
PM2.5 FRM	Highest Concentration	A second s	PM2.5 Cont. Spe			
PM10 Cont. (BAM)	Demulation From a suma	Neighborhood	Monitor Networ	18 17 10		
PM10-2.5 FRM	Population Exposure					
PM10-2.5 BAM PM10 Lead (PB)	Source Oriented	Urban	NCORE			
PM2.5 Cont. (BAM)	Transport	Regional	SUPPLEME	NTAL SPECIATION		
PM2.5 Spec. (SASS)	☐Welfare Related Impacts		Monitor NAAQ	S Exclusion		
PM2.5 Spec. (URG) PM2.5 Cont. Spec.			NONREGUL	ATORY		
	∎ ground) □ < 2 m	L2-7m 7-		> 15 m		
Actual measured distance	e from probe inlet to ground (me					
ambient probe on the roo	f. Both are within the 2-7 meter	range.				
	f probe inlet from horizontal (wa					
	e from outer edge of probe inlet t			Yes 🛛 No 🗌		
low volume monitor at th	ter edge of probe inlets of any lo ne site = 1 m or greater?	w volume monitor a	ind any other	Yes 🛛 No 🗌 NA 🗌		
	ter edge of all low volume monit	or inlets and any Hi	-Volume PM-10	Yes 🔲 No 🗌 NA 🗙		
or TSP inlet = 2 m or gre	ater?					
Are collocated PM2.5 M TEOM, BAM & TEOM)	onitors (Two FRMs, FRM & BA	.M, FRM & ,	*Yes 🔲 (answer *	'd questions) No 🛛 NA 🗌		
	collocated PM 2.5 samplers (X)	within 2 to 4 m				
of each other?	······································		Yes 🗌 No 🗌 🤇	Five actual (meters)		
	ampler inlets within 1 m vertical					
	collocated with a SASS monitor collocated speciation samplers in					
Give actual (meters)	conocated speciation samplers in	1000 mm = 10000 mm = 100000 mm = 100000 mm = 100000000000000000000000000000000000	4 m of each other			
	on sampler inlets within 1 m ver	ically of each other	? Yes 🗌 No 🗌	Give actual (meters)		
Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the						
	* Entire inlet opening of collocated PM10 and PM2 Scamplers for PM10.2.5 (X) within 2					
to 4 m of each other?		P	()	Yes 🗌 No 🗌		
	nd PM2.5 sampler inlets within 1			Yes 🗌 No 🗌		
Is probe > 20 m from the	nearest tree drip line? Yes 🛛	*No 📙 (answer	*'d questions)			
	e nearest tree drip line? Yes] *No 🗌				
*Distance from probe to	tree (m) Direction from o air flow? *Yes 🗌 (answer *'d	probe to tree	*Height of tree (m)			
	Distance from probe inlet (m)		n nraha inlat ta ah	rtaala		
	obe to obstacle at least twice the					
Distance of probe to near	rest traffic lane (m) <u>17</u> Directi	on from probe to ne	arest traffic lane <u>N</u>			
RECOMMENDATIONS						
1) Maintain current site s	tatus? Yes 🛛 *No 🗌 (answ	ver *'d questions)				
*2) Change monitoring o	bjective? Yes 🔲 (enter new o	bjective <u>)</u> 1	No 🔲 -			
*3) Change scale of repre	esentativeness? Yes 🔲 (enter	new scale)	No 🗖			
*4) Relocate site? Yes		2				
<u>Comments:</u> Wind Speed/Wind Diection sensors were shut down on June 28, 2016. Aethalometer was shut down on August 8, 2016. HSNOy monitor was shutdown on November 3, 2016. 8400N was shutdown on November 4, 2016.						
Date of Last Site Pictures 10/28/2016 New Pictures Submitted? Yes X No						
				Data 11/17/2016		
Reviewer <u>Robert Jay Papu</u> Ambient Monitoring Coor				Date <u>11/17/2016</u> Date <u>12/28/2016</u>		
ranoioni monitoring C00						

Rockwell Site Review 2016



2014 Annual Average Daily Traffic, AADT, star represents location of the Rockwell monitoring station AADT obtained from the North Carolina Department of Transportation Traffic Survey Unit

Appendix C-2. Scale of Representativeness

Each station in the monitoring network must be described 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 correctly match 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:

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

Table C7. Site Type Appropriate Siting Scales