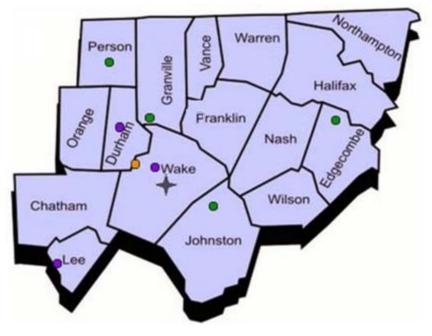


# 2016-2017 Annual Monitoring Network Plan for the North Carolina Division Of Air Quality

Volume 2

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

**D.** The Raleigh Monitoring Region



July 1, 2016



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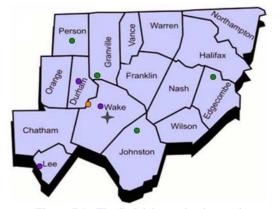
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#### **D.** The Raleigh Monitoring Region

The Raleigh monitoring region of North Carolina, shown in Figure D1, consists of six sections: (1) the Durham-Chapel Hill metropolitan statistical area, MSA, (Chatham, Durham, Orange and Person counties), (2) the northeastern Piedmont (Granville, Halifax, Northampton, Vance and Warren counties), (3) the Raleigh MSA (Franklin, Johnston and Wake counties), (4) the Rocky Mount MSA (Edgecombe and Nash counties), (5) the Wilson micropolitan statistical area (Wilson County) and (6) the Sanford micropolitan statistical area (Lee County).

#### (1) Durham-Chapel Hill MSA

The Durham-Chapel Hill MSA consists of four counties: Chatham, Durham, Orange and Person. The major metropolitan areas are the cities of Durham and Chapel Hill. The North Carolina Division of Air Quality, DAQ, currently operates two monitoring sites in the Durham-Chapel Hill MSA. These sites are located at the Durham Armory in Durham (Durham County), and Bushy Fork (Person County). Starting on January 1, 2017, DAQ in cooperation with Duke Energy Progress will begin operating a third site in Semora (Person County). The locations of these monitors are shown in Figure D2. The seasonal ozone monitor in Pittsboro in Chatham County was shut down on October 31, 2015, at the end of ozone season, and the rotating sulfur dioxide monitor was shut down on February 4, 2015.



**Figure D1. The Raleigh monitoring region** The dots show the approximate locations of most of the monitoring sites in this region.

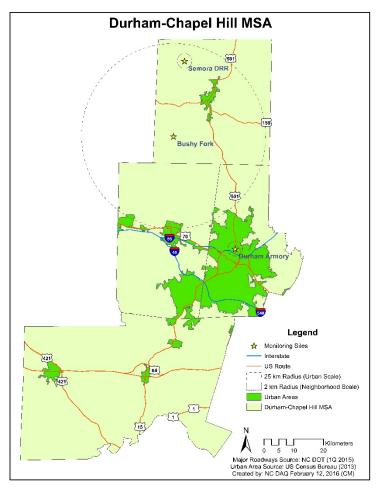


Figure D2. Location of monitors in the Durham-Chapel Hill MSA.

At the Durham Armory site the DAQ operates a seasonal ozone monitor, a one-in-three day fine particle FRM monitor, a continuous low volume  $PM_{10}$  monitor and a continuous fine particle monitor. The site, as well as views looking north, northeast, east, southeast, south, southwest, west and northwest, is shown in Figure D3 through Figure D11. This fine-particle monitoring site is the design value site for the MSA. On Jan. 1, 2011, the DAQ started operating a low volume  $PM_{10}$  monitor at the site to meet minimum  $PM_{10}$  monitoring requirements in the Durham-Chapel Hill MSA and to provide  $PM_{10-2.5}$  data. In May 2015 this monitor was changed to a continuous low volume  $PM_{10}$  monitor.



Figure D3. The Durham Armory ozone, sulfur dioxide and particle monitoring site



Figure D4. Looking north from the Durham Armory site



Figure D5. Durham Armory site looking northwest



Figure D6. Durham Armory site looking northeast



Figure D7. Looking east from the Durham Armory site



Figure D8. Looking west from the Durham Armory site



Figure D9. Durham Armory site looking southwest

At the Bushy Fork site, the DAQ operates a seasonal ozone monitor. A special purpose sulfur dioxide monitor operated for 12 months from June 2014 through May 2015 to provide background sulfur dioxide concentrations for Person County to support modeling requirements for the sulfur dioxide national ambient air quality standard, NAAQS. A picture of the site as well as views looking north, east, south and west are provided in Figure D12 through Figure D16.



Figure D10. Durham Armory site looking southeast



Figure D11 Looking south from the Durham Armory site



Figure D12. Bushy Fork ozone monitoring site



Figure D13. Bushy Fork site looking north



Figure D14. Bushy Fork site looking west

At the Semora DRR site, DAQ proposes to operate a source-oriented sulfur dioxide monitor to meet the requirements in the 2010 sulfur dioxide data requirements rule. The monitor will operate for a minimum of three years from 2017 to 2019 to ensure that ambient air in the proximity of the Duke Energy Progress Roxboro plant meets the national ambient air quality standards. An aerial view of the proposed site in relationship to the Roxboro facility as well as views looking north, east, south and west from the proposed location are provided in Figure D17 through Figure D21. ---



Figure D15. Bushy Fork site looking east



Figure D16. Bushy Fork site looking south



Figure D17. Aerial view showing the location of the proposed Semora DRR monitoring station



Figure D18. Looking north from the proposed Semora DRR monitoring station



Figure D19. Looking west from the proposed Semora DRR location



Figure D20. Looking east from the proposed Semora DRR location



Figure D21. Looking south from the proposed Semora DRR location

In 2008 EPA expanded the **lead** monitoring network to support the lower lead NAAQS of 0.15 micrograms per cubic meter. On Dec. 27, 2010, the EPA revised the monitoring requirements to focus on fence line monitoring located at facilities that emit 0.5 tons or more of lead per year and at National Core, NCore, monitoring sites. These changes to the lead monitoring network requirements did not require any lead monitoring in the Durham-Chapel Hill MSA. This MSA does not have an NCore monitoring station. Also, the Duke Progress Energy Roxboro electricity

generating facility emitted 122.4 pounds of lead in 2014, well below the 0.5 ton threshold. In addition, modeling performed in 2009 indicated the concentrations of lead in ambient air around the facility are less than 0.01 micrograms per cubic meter, which is far enough below the NAAQS that no fence-line monitoring is required for this facility.

At this time the MSA is required to operate two **ozone** monitors – one at the Durham Armory and one at Bushy Fork. Beginning in 2017, seasonal ozone monitoring will start on March 1 instead of April 1.

The 2010 **nitrogen dioxide** monitoring requirements currently require the Durham-Chapel Hill MSA to monitor for nitrogen dioxide because its population exceeded the 500,000 threshold in 2009. Thus, DEQ is required to operate a near roadway monitor. In 2013 due to lack of funds, the United States Environmental Protection Agency, EPA, revised the regulation to require near road monitors in MSAs with less than one million people to start operating on Jan. 1, 2017. However, on May 15, 2016, the EPA proposed eliminating the requirement to monitor for nitrogen dioxide in areas with populations below one million.<sup>1</sup> Accordingly, and with the concurrence of EPA Region 4, DAQ placed a hold on planning activities for the Durham site. DAQ understands the EPA plans on completing the associated final rule before Jan. 1, 2017, and continues to follow this issue. DAQ will adjust plans, if needed, as further information becomes available from the EPA.

In the technical assistance document EPA recommends placing near road monitoring stations along road segments with the highest average annual daily traffic values adjusted for fleet mix. Sites should also be evaluated based on congestion patterns, roadway design, terrain and meteorology. Preliminary analysis of the segments in the Durham-Chapel Hill MSA with the highest average annual daily traffic adjusted for fleet mix are shown in Table D 1 and Table D2.

<sup>&</sup>lt;sup>1</sup> Revision to the Near-Road NO2 Minimum Monitoring Requirements, Federal Register, Vol. 81, No. 94 Monday, May 16, 2016, p. 30224, available on the worldwide web at <u>https://www.gpo.gov/fdsys/pkg/FR-2016-05-16/pdf/2016-11507.pdf</u>.

Station	Route	Location	Station	Percent Passenger	2013 AADT	Fleet Equivalent AADT
Station	Route	Location	Station	Percent Passenger	2014 AADT	Fleet Equivalent AADT
(A)1011	I-40	From Exit 282 To Exit 283	09MC0030	90%	180,000	342,000
(B)947	I-40	From Exit 281 To Exit 282	09MC0030	90%	174,000	330,600
(C)547	I-40	From Exit 280 To Exit 281	09MC0030	90%	162,000	307,800
(D)553	I-40	From Exit 279 To Exit 280	10MC0005	94%	156,000	240,240
(E)942	I-40	From Exit 273 To Exit 274	09MC0028	90%	120,000	228,000
941	I-40	From Exit 274 to Exit 276	09MC0028	90 %	117,000	222,300
(G)6	I-85	From Exit 160 To Exit 161	09MC0069	88%	103,000	214,240
(I)91	I-85	From Exit 161 To Exit 163	09MC0069	88%	99,000	205,920
(J)5	I-85	From Exit 157 To Exit 160	09MC0069	88%	98,000	203,840
(F)727	I-40	From Exit 278 To Exit 279	10MC0005	94%	128,000	197,120
202	I-85	From Exit 174B to Exit 174	09MC0069	88 %	94,000	195,520
(H)940	I-40	From Exit 276 To Exit 278	10MC0005	94%	126,000	194,040

 Table D 1. Fleet Equivalent Average Annual Daily Traffic for Road Segments in the Durham-Chapel Hill Metropolitan Statistical Area Using Published NCDOT Data

# Table D2. Fleet Equivalent Average Annual Daily Traffic for Road Segments in the Durham-Chapel Hill Metropolitan Statistical Area Using Microwave Radar Data

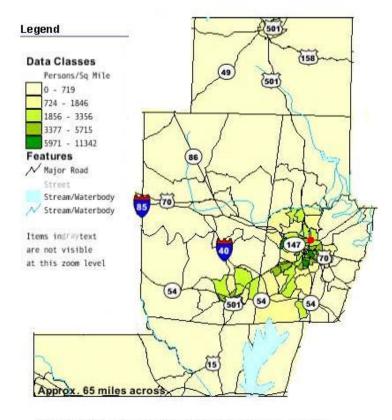
		2013 Traffic Monitor Data			2014 Tr	affic Monit	or Data
Route	Location	Percent Passenger	AADT	Fleet Equivalent AADT	Percent Passenger	AADT	Fleet Equivalent AADT
(B)I-40	Exit 281 to 282	95	157,673	235,806	95	152,803	221,736
(C)I-40	Exit 280 to 281	97	147,546	185,472	97	147,934	183,947
(D)I-40	Exit 279 to 280	97	127,371	167,573	98	137,153	166,776
(F)I-40	Exit 278 to 279	98	137,314	167,224	96	118,952	156,811
(H)I-40	Exit 276 to 278	97	114,740	143,302	97	117,298	145,941
(E)I-40	Exit 273 to 274	97	111,733	140,247	97	105,718	132,735
(K)I-40	Exit 274 to 276	98	101,687	121,505	98	109,205	130,830
(L)I-40	Exit 270 to 273	96	83,527	113,511	96	86,083	117,350

The locations of these segments are shown with lettered symbols in Figure D22. They stretch from the eastern part of Durham County into central Orange County with heaviest fleet adjusted average annual daily traffic being along I-40 near the Durham-Wake County line. Because the highest ranked sites are within two miles of the Raleigh near road monitoring site off of Triple Oak Road along I-40 between Exit 283 and Exit 284 and have similar traffic counts and heavy duty vehicle make-up, the DAQ requests a waiver for the near road Durham-Chapel Hill monitoring site, if the EPA does not finalize its proposal to eliminate near-road monitoring in areas with less than 1 million people. The waiver request is in Section 2 of Volume I of the network plan.



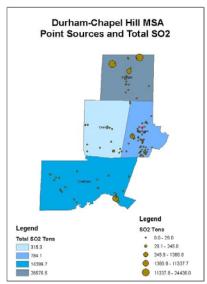
Figure D22. Locations of segments with highest fleet adjusted AADT in the Durham-Chapel Hill MSA

The 2010 sulfur dioxide monitoring requirements added additional monitoring in this MSA. Because of power generating facilities located in Person and Chatham counties and a large population base, a populationweighted emission index, PWEI, population exposure monitor was added at the Armory site. Figure D23 shows the location of the PWEI monitor relative to where people lived based on the 2000 census. Figure D24 shows the distribution of sulfur dioxide emissions among the counties in the MSA. The closest permitted source of sulfur dioxide to the Armory site is Carolina Sunrock, located 3.25 kilometers southeast of the site, as shown in Figure D25. Carolina Sunrock reported emitting 5.4 tons of sulfur dioxide in 2011. As mentioned earlier an additional source-oriented sulfur dioxide monitor is required in this MSA by Jan. 1, 2017.



Source: U.S. Census Bureau, Census 2000 Summary File 1, Matrix P1.

Figure D23. Location of Durham-Chapel Hill PWEI monitor in relationship to centers of population in 2000



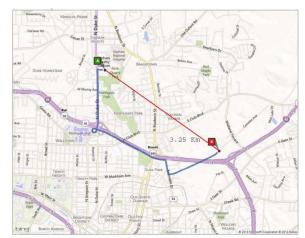


Figure D25. Location of the Armory monitoring site (A) in relationship to Carolina Sunrock (B)

Figure D24. Location of the Durham-Chapel Hill PWEI sulfur dioxide monitor (red dot) in relationship to sulfur dioxide sources

Changes to the **carbon monoxide monitoring** requirements did not add additional monitoring to this MSA because the population is less than one million.

#### (2) The Northeastern Piedmont

The northeastern Piedmont consists of five counties: Granville, Halifax, Northampton, Vance and Warren. There is not an MSA in these counties; however, Henderson micropolitan statistical area is located in Vance County and the Roanoke Rapids micropolitan statistical area consists of Halifax and Northampton counties. The DAQ currently operates one monitoring site in the northeastern piedmont. This site is located at Butner (Granville County). The location of this monitoring site is shown in Figure D26.



A is the Butner ozone monitoring site. The circle around the site approximates the urban scale (4 to 50 Km).

At the **Butner** site, 37-077-0001, the DAQ operates a seasonal ozone monitor. A picture of the site as well as views looking north, east, south and west are provided in Figure D27 through Figure D35. The

Butner site was established as the downwind site for the Durham-Chapel Hill MSA when the wind is from the primary direction during the season of highest ozone concentrations.



Figure D27. The Butner ozone monitoring site



Figure D28. Looking north from the Butner site



Figure D29. Looking northwest from the Butner site



Figure D30. Looking northeast from the Butner site



Figure D31. Looking east from the Butner site



Figure D32. Looking west from the Butner site



Figure D33. Looking southwest from the Butner site



Figure D34. Looking southeast from the Butner site



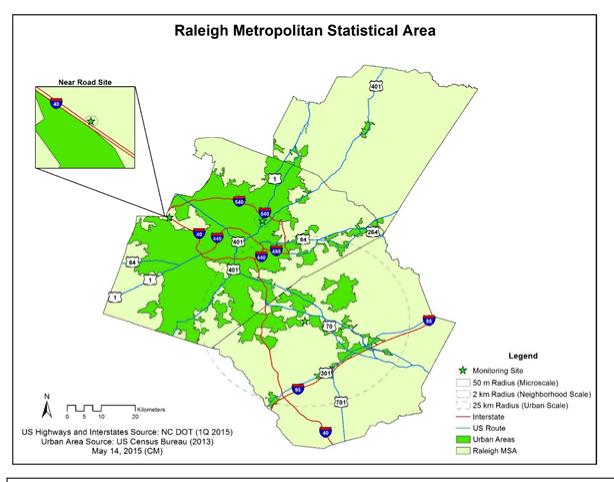
Figure D35. Looking south from the Butner site

This area was not required to add any lead monitors because of the 2010 changes made to the **lead monitoring** requirements. There are no facilities here that emit 0.5 ton or more of lead per year.

New **ozone monitoring** requirements will not require additional monitoring in the northeastern Piedmont. The area does not have any MSAs that are required by 40 CFR 58 Appendix D to conduct population exposure monitoring in urban areas. The northeastern Piedmont did not add monitors as a result of the 2010 **nitrogen dioxide** monitoring requirements because it does not have any roads exceeding the traffic threshold and does not have any MSAs that trigger nitrogen dioxide monitoring requirements. The northeastern piedmont will also not add sulfur dioxide monitors because of the 2010 **sulfur dioxide monitoring** requirements because there are no large sources of sulfur dioxide in this area. This area will also not be required to do carbon monoxide monitoring as a result of the changes to the **carbon monoxide monitoring** requirements because the population is under one million.

#### (3) The Raleigh MSA

As shown in Figure D36, the Raleigh MSA consists of three counties: Franklin, Johnston and Wake. The major metropolitan areas include Raleigh and Cary. The DAQ currently operates three monitoring sites in the Raleigh MSA. These sites are located at West Johnston (Johnston County) and Millbrook and Triple Oak (Wake County). The ozone monitors at Franklinton and Fuquay were shut down on Oct. 31, 2015.



Millbrook multipollutant site, center, neighborhood scale; Triple Oak nitrogen dioxide monitor, furthest west, micro scale; and West Johnston ozone and particle monitors, furthest east, urban scale.

#### Figure D36. Monitoring sites located in the Raleigh MSA.

At the **West Johnston** site, 37-101-0002, the DAQ operates a seasonal ozone monitor and a one-in-three day fine particle FRM monitor. The West Johnston ozone site was established as the upwind site for the Raleigh MSA when the wind is from the secondary direction during the season of highest ozone concentrations. This site is one of two ozone-monitoring sites in the MSA. 40 Code of Federal Regulations, CFR, 58 Appendix D requires the Raleigh MSA to have two ozone monitoring sites. The West Johnston fine particle site is the second fine particle monitoring site in the MSA because the Raleigh MSA has a population over 1 million people and is currently required to have three fine particle monitors. The North Carolina Division of Air Quality is planning on adding a continuous fine particle monitor at the site in 2016 that will eventually replace the FRM monitor. A picture of the site and views looking north, east, south and west are provided in Figure D37 through Figure D41.



Figure D37. The West Johnston ozone and fine particle monitoring site



Figure D38. Looking North from the West Johnston Site



Figure D40. Looking east from the West Johnston site



Figure D39. Looking West from the West Johnston Site



Figure D41. Looking south from the West Johnston site

At the **Millbrook** site, 37-183-0014, the DAQ operates year-round ozone, one-in-three-day fine particle FRM, one-in-three-day manual SASS and URG fine particle speciation, continuous BAM fine particle, one-in-three day  $PM_{10}$  and  $PM_{10-2.5}$ , a collocated one-in-six day  $PM_{10}$ , nitrogen dioxide and trace-level sulfur dioxide, carbon monoxide and reactive oxide of nitrogen monitors. The DAQ also operates continuous fine particle monitors for sulfate, nitrate and black carbon and a meteorological station at this site. A picture of the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest are provided in Figure D42 through Figure D50. The Millbrook site is an NCORE, National Community Representative, site so the probe for the reactive oxide of nitrogen monitor at this site was installed on a 10-meter tower in late 2010. Dec. 27, 2011, the DAQ began analyzing the low volume  $PM_{10}$  filters for lead on a one-in-six-day schedule to meet the 2010 monitoring requirements for lead monitoring at NCore sites. This lead monitoring ended on April 30, 2016. In 2013 the DAQ added a carbonyl sampler to the site to support a shale gas development background monitoring study in Lee County. The DAQ has monitored for VOCs at Millbrook since July 14, 2004, on a 1-in-6-day schedule.



Figure D42. Millbrook NCore monitoring site



Figure D43. Looking north from the Millbrook site



Figure D44. Looking northwest from the Millbrook site



Figure D45. Looking west from the Millbrook site



Figure D46. Looking southwest from the Millbrook site



Figure D47. Looking northeast from the Millbrook site



Figure D48. Looking east from the Millbrook site



Figure D49. Looking southeast from the Millbrook site



Figure D50. Looking south from the Millbrook site

At the **Triple Oak** site, 37-183-0021, the DAQ operates a near road nitrogen dioxide monitor with a photolytic convertor. The monitor started operating on Jan. 8, 2014. A picture of the site as well as views looking north, east, south and west are provided in Figure D51 through Figure D55. In 2017, the DAQ will add a carbon monoxide monitor and a fine particle monitor to the site.



Figure D51. The Triple Oak near road nitrogen dioxide monitoring site, 37-183-0021



Figure D52. Looking north from the Triple Oak site



Figure D53. Looking east from the Triple Oak site



Figure D54. Looking west from the Triple Oak site



Figure D55. Looking south from the Triple Oak site

As a result of the December 2010 changes to the **lead monitoring** requirements,<sup>2</sup> the DAQ began lead monitoring at the Raleigh Millbrook monitoring site on Dec. 27, 2011, using the low-volume  $PM_{10}$  monitor already at the site. This lead monitoring ended on April 30, 2016, when new monitoring regulations became effective.<sup>3</sup> The Raleigh MSA does not have any permitted facilities located within its bounds that emit 0.5 ton or more per year of lead so no other lead monitoring was required.

Changes to the **ozone monitoring** requirements in 2015 did not require additional monitoring in the Raleigh MSA. The MSA currently meets 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.

Due to the 2010 **nitrogen dioxide** monitoring requirements, DAQ added two nitrogen dioxide monitors to the Raleigh MSA. Because its population exceeds the 500,000 threshold, it is required to have a near road monitor starting Jan. 1, 2014. The near road monitoring station was placed on the west bound side of I-40 between Exit 283 and 284. This location was approved by the EPA in 2012. The Raleigh MSA has over 1 million people so it is also required to have a community or area-wide monitor. This monitor is located at the Raleigh Millbrook NCore monitoring site. The monitor was scheduled to start operating on Jan. 1, 2013. The DAQ asked for permission to delay installing the monitor so that a photolytic nitrogen dioxide monitor could be installed at the site. The photolytic nitrogen dioxide monitor is more selective for nitrogen dioxide but because it was approved as an equivalent method in 2012 the DAQ could not purchase it and have it up and operational by the Jan. 1, 2013, scheduled start date. The DAQ began monitoring for nitrogen dioxide at Millbrook on Dec. 10, 2013.

The 2010 **sulfur dioxide monitoring** requirements did not require additional sulfur dioxide monitors in the Raleigh MSA because there are no large sources of sulfur dioxide in the MSA. This MSA will be required to add a carbon monoxide monitor as a result of the changes to the **carbon monoxide monitoring** requirements. Near road carbon dioxide monitoring is required in MSAs greater than one

<sup>&</sup>lt;sup>2</sup> Revisions to the Lead Ambient Air Monitoring Requirements, Federal Register, Vol. 75, No. 247, Monday, December 27, 2010, available on the worldwide web at <a href="https://www.gpo.gov/fdsys/pkg/FR-2010-12-27/pdf/2010-32153.pdf#page=1">https://www.gpo.gov/fdsys/pkg/FR-2010-12-27/pdf/2010-32153.pdf#page=1</a>.

<sup>&</sup>lt;sup>3</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>.

million people starting Jan. 1, 2017. On Jan. 1, 2017, the DAQ will also be required to add a fine particle monitor at the Triple Oak near road monitoring site.

### (4) Rocky Mount MSA

The Rocky Mount MSA consists of two counties: Edgecombe and Nash. The major metropolitan area is the City of Rocky Mount. The DAQ currently operates one monitoring site in the Rocky Mount MSA, located in Edgecombe County at Leggett as shown in Figure D56.

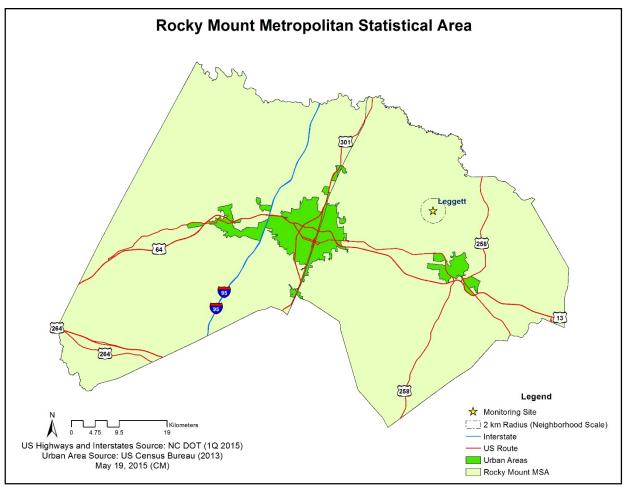


Figure D56. Monitoring site location in the Rocky Mount MSA

At the **Leggett** site, the DAQ operates a seasonal ozone monitor and a non-regulatory continuous fine particle monitor. The ozone monitor is required for the MSA. In April 2011, the DAQ added a continuous fine particle monitor to the site to enable real time fine particle air quality index reporting and fine particle forecasting. Figure D57 through Figure D65 show the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest.



Figure D57. Leggett seasonal ozone and air quality index monitoring site



Figure D58. Looking north from the Leggett site



Figure D59. Looking northeast from the Leggett site



Figure D60. Looking northwest from the Leggett site



Figure D61. Looking west from the Leggett site



Figure D62. Looking southwest from the Leggett site



Figure D63. Looking east from the Leggett site



Figure D64. Looking southeast from the Leggett site



Figure D65. Looking south from the Leggett site

Changes made to the **lead monitoring** requirements in December 2010 did not require additional monitoring in the Rocky Mount MSA. The MSA does not have an NCore monitoring site and does not have any permitted facilities located within its bounds that emit 0.5 tons or more of lead per year.<sup>4</sup>

<sup>&</sup>lt;sup>4</sup> Data obtained from the DAQ emission inventory database available on the worldwide web at <u>https://xapps.ncdenr.org/aq/ToxicsReport/ToxicsReportFacility.jsp?ibeam=true&county\_code=065&year=2014&s</u> <u>orting=103&overridetype=All&pollutant=153</u>.

2015 changes to the **ozone monitoring requirements** are not expected to require additional monitoring in the Rocky Mount MSA. The MSA already has the minimum number of monitors required by 40 CFR 58 Appendix D for population exposure monitoring in urban areas. The seasonal ozone monitor may begin a month earlier on March 1 instead of April 1 beginning in 2016 or 2017.

The 2010 **nitrogen dioxide monitoring** requirements did not add any monitors to the Rocky Mount MSA because its population is less than 500,000. Additional monitors will also not be needed to meet the 2010 sulfur dioxide monitoring requirements because there are no large sources of sulfur dioxide in the MSA. This area will also not need any carbon monoxide monitors due to the changes to the **carbon monoxide monitoring** requirements because the population is under one million.

## (5) The Wilson Micropolitan Statistical Area

The Wilson Micropolitan Statistical Area consists of Wilson County. There currently is no Metropolitan Statistical Area in Wilson County; however, the Wilson Micropolitan Statistical Area is located here. The Wilson area is growing and may someday eventually be large enough to become an MSA. The DAQ currently does not operate any monitoring sites in the Wilson Micropolitan Statistical Area.

The Wilson Micropolitan Statistical Area was impacted by changes made to the **lead monitoring** requirements in December 2010 because it has a permitted facility located within its bounds that emits more than 0.5 tons per year of lead.<sup>5</sup> Saint-Gobain Containers, LLC, reported 2009 lead emissions of 0.84 tons. The DAQ requested and received a waiver for Saint-Gobain based on the results of modeling. Model results indicate the maximum ambient lead concentration in the ambient air at and beyond the fence line is 0.015 micrograms per cubic meter, well below the 0.075 micrograms per cubic meter (50 percent of the NAAQS) threshold for monitoring. The EPA renewed the waiver in 2015 based on 2011 National Emission Inventory emissions of 0.53 tons of lead. The waiver is good until 2020.<sup>6</sup> In 2014 Ardagh Glass, the former Saint Gobain Containers, reported 495.1 pounds of lead emissions.<sup>7</sup>

Changes to the **ozone monitoring** requirements in 2015 did not require additional monitoring in the Wilson Micropolitan Statistical Area. As long as it is not an MSA, it does not have to meet population exposure monitoring requirements for urban areas. The Wilson Micropolitan Statistical Area was not reclassified as an MSA in February 2013 when the MSA classifications were revised. The next scheduled revision for MSA classifications is in 2023; however, sometimes the Office of Management and Budget adjusts classifications between the scheduled revisions.

The Wilson Micropolitan Statistical Area was not required by the 2010 **nitrogen dioxide monitoring** rule to do any nitrogen dioxide monitoring. Its population is less than 500,000 and the annual average daily traffic measured on its roadways is below the threshold for monitoring. It also is not required to do sulfur

<sup>&</sup>lt;sup>5</sup> Data obtained from the DAQ emission inventory database available on the worldwide web at <u>https://xapps.ncdenr.org/aq/ToxicsReport/ToxicsReportFacility.jsp?ibeam=true&county\_code=195&year=2009&s\_orting=103&overridetype=All&pollutant=153</u>.

<sup>&</sup>lt;sup>6</sup> 2015 State of North Carolina Ambient Air Monitoring Network Plan, The U. S. EPA Region 4 Comments and Recommendations, p7, available at

http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=7440. <sup>7</sup> Data obtained from the DAQ emission inventory database available on the worldwide web at <u>https://xapps.ncdenr.org/aq/ToxicsReport/ToxicsReportFacility.jsp?ibeam=true&year=2014&county\_code=195&fi</u> ndfacility=2589

dioxide monitoring by the 2010 **sulfur dioxide monitoring** rule because the population is too small and the sulfur dioxide emissions are too low to trigger PWEI monitoring. This area is also not required to do carbon monoxide monitoring by the changes to the **carbon monoxide monitoring** requirements because the population is under one million.

#### (6) The Sanford Micropolitan Statistical Area

The Sanford Micropolitan Statistical Area consists of Lee County. The DAQ started a monitoring site in the Sanford Micropolitan Statistical Area in November 2013. The location of the site is shown in Figure D66. The Blackstone monitoring station supports a special study to monitor baseline ambient air near potential shale gas development areas in Lee County.<sup>8</sup> Ozone monitoring started on Nov. 1, 2013 and a continuous fine particle monitor started Jan. 1, 2014. In December 2014 the DAQ added a sulfur dioxide monitor and nitrogen dioxide monitor. The site also monitors for volatile organic and carbonyl toxic compounds and hydrocarbons. Figure D67 through Figure D71 shows the site and views looking north, east, south and west.

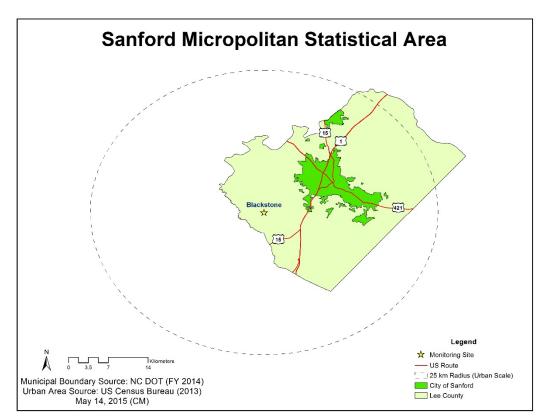


Figure D66. Monitoring site location in the Sanford micropolitan statistical area

<sup>&</sup>lt;sup>8</sup> Department of Environment and Natural Resources, Division of Air Quality, Project Plan for Baseline Ambient Air Monitoring near Potential Shale Gas Development Zones in Lee County, NC, Feb. 19, 2013. Available on the world wide web at <u>http://daq.state.nc.us/news/shale/DAQ\_Project\_Plan.pdf</u>.



Figure D67. Blackstone shale gas development monitoring site



Figure D68. Looking north from the Blackstone site



Figure D69. Looking west from the Blackstone site



Figure D70. Looking east from the Blackstone site



Figure D71. Looking south from the Blackstone site

The Sanford micropolitan statistical area was not required to do any lead monitoring as a result of the changes made to the **lead monitoring** requirements in December 2010. There are no facilities located within its bounds that emit more than 0.5 tons per year of lead.<sup>9</sup>

Changes to the **ozone monitoring** requirements in 2015 did not require additional ozone monitoring in the Sanford micropolitan statistical area. As long as it is not an MSA, it does not have to meet population exposure monitoring requirements for urban areas.

The Sanford micropolitan statistical area was not required by the 2010 **nitrogen dioxide monitoring** rule to do any nitrogen dioxide monitoring. Its population is less than 500,000 and the annual average daily traffic measured on its roadways is below the threshold for monitoring. It also is not required by the 2010 **sulfur dioxide monitoring** rule to do sulfur dioxide monitoring because the population is too small and the sulfur dioxide emissions are too low to trigger PWEI monitoring. This area is also not required to do carbon monoxide monitoring by the changes to the **carbon monoxide monitoring** requirements because the population is under one million.

<sup>&</sup>lt;sup>9</sup> Data obtained from the DAQ emission inventory database.

## Appendix D.1 Annual Network Site Review Forms for 2015

Pittsboro (site was shut down)

Durham Armory in Durham

Bushy Fork

Butner

Franklinton (site was shut down)

West Johnston in Johnston County

Millbrook in Raleigh

Fuquay (site was shut down)

Triple Oak Road in Cary

Springfield Road in Rocky Mount (2012)

Leggett

Blackstone in Lee County

Region RRO Site Na	ame Pittsbo	oro			AOS	5 Site # 37-	-037-0004	
	Street Address-325 Russett Run Rd			City Pit			007 0001	
Urban Area Not in an Urban		Core-base	d St					
Enter E	xact							
Longitude <u>-79.15995</u>	Latitude	35.7	574		Me	thod of M	easuring	
In Decimal Degrees	In Decim	al Degrees		Interpola	ation	Explanat	tion: <u>Ort</u>	<u>hophoto</u>
Elevation Above/below Mean	Sea Level	(in meters)				<u>400</u>		
Name of nearest road to inlet p	probe Russ	sett Run Rd.	AD	1 <u>0</u> Year	latest :	available <u>0</u>		
Comments: Low traffic road;	traffic volu	ume data not	avai	lable				
Distance of site to nearest maj	or road (m)	) <u>620.00</u> Di	irecti	on from sit	te to no	earest majo	or road <u>W</u>	1
Name of nearest major road	US HWY 1	<u>5-501</u> ADT	160	000 Year 1	atest a	vailable20	13	
Comments:								
Site located near electrical sub	station/hig	h voltage po	wer	lines?			Yes	No 🗙
Distance of site to nearest rails	road track		(m)		Direc	tion to RR		NA
Distance of site to nearest power pole (m) Direction								
w/transformer								
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, fast food restaurants, and swimming pools.								

## 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 (		ive actual measured height	from ground (meters) 3.44		
Distance of outer ed	Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes $\boxtimes$ No $\square$ Actual measured distance from outer edge of probe to supporting structure (meters) <u>.8</u>				
	lge of probe inlet from other gas monitoring probe		Yes 🛛 No 🗌 NA 🗌		
Is probe > 20 m fro	m the nearest tree drip line? Yes 🛛 *No 🗌	(answer *'d questions)			
*Is probe > 10 m fr	om the nearest tree drip line? Yes 🔲 *No 🗌				
*Distance from pro	*Distance from probe to tree (m) Direction from probe to tree *Height of tree (m)				
Are there any obsta	cles to air flow? *Yes 🗌 (answer *'d questions) ]	No 🛛			
	Distance from probe inlet (m)Dire let probe to obstacle at least twice the height that				
Distance of probe to	o nearest traffic lane (m) 600 Direction from pr	Tobe to nearest traffic lane $\underline{V}$	V		

UP 2015 Site Review

OZONE 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: This site will be shut-down in 2015.

#### ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type		
SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (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	ground) 2-15 m? Yes 🛛 No 🗌 🛛 G	live actual measured height	from ground (meters) 3.44		
Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes $\boxtimes$ No $\square$ Actual measured distance from outer edge of probe to supporting structure (meters) <u>0.8</u>					
Distance of outer edge of	probe inlet from other monitoring probe inle	ets > 1 m?	Yes 🛛 No 🗌 NA 🗌		
	nearest tree drip line? Yes 🛛 *No 🗌				
*Is probe > 10 m from the	e 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	o air flow? *Yes 🗌 (answer *'d questions) I				
*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 🗌					
Distance of probe to nearest traffic lane (m) $\underline{600}$ Direction from probe to nearest traffic lane $\underline{W}$					

SULFUR DIOXIDE MONITOF	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:This site will be shut-down in 2015.					
Date of Last Site Pictures 2013 New Pictures Submitted? Yes 🔲 No 🔀					
Reviewer C. Marshall Cannon	DateDecember 7, 2015				
Ambient Monitoring Coordinator <u>RAT</u>	DateDecember 7, 2015				
Revised 2015-12-07					

UP 2015 Site Review

Region_RRO         Site Name Durham Armory			AQS Site # 37- <u>063-0015</u>			
Street Address-801 Stadium Dr.				City <u>Durham</u>		
				tatistical Area Durham, NC		
Enter Exact						
Longitude <u>-78.904</u>	0	Latitude <u>36.0329</u>		Method of Measuring		
In Decimal Degrees	r 0	In Decimal Degrees		Explanation: <u>Google Maps</u>		
Elevation Above/below Name of nearest road to inle			lear le	atest available	<u>109</u>	
Comments: Stadium Dr.has	100		Cal la		-	
Distance of site to nearest n			n site	to nearest major road	W	
Name of nearest major road	-			to neurost mujer roud	<u></u>	
Comments: <u>None</u>	<u>D mre is</u>	<u>, , , , , , , , , , , , , , , , , , , </u>	2010			
Site located near electrical s	substation	/high voltage power lines?			Yes 🔲 No 🛛	
Distance of site to neares	t railroad	l track	(m)	Directio	n to RR	
Distance of site to neares				43 Direction SSE		
Distance between site and d						
Explain any sources of per- construction activities, fa					acks, vents, railroad tracks,	
has been awarded yet.	to have n	najor construction activities	. Cons	truction was to begin	in the Fall of 2015, but no contract	
<u>Hub been undraced yet.</u>						
ANSWER ALL APPLICA			-	<u> </u>		
Parameters	M	onitoring Objective		Scale	Monitor Type	
$\square$ NA $\blacksquare$ SO <sub>2</sub> (NAAQS)		eral/Background		vlicro	SLAMS <u>SO2 O3</u>	
$\square$ SO <sub>2</sub> (trace-level)		est Concentration		√liddle	SPM	
NO <sub>x</sub> (NAAQS)		O3 Concentration lation Exposure <u>SO2 O3</u>		Neighborhood	Monitor Network Affiliation	
$HSNO_y$ $O_3$		ce Oriented		Jrban <u>SO2 O3</u>	NCORE	
$\square$ NH <sub>3</sub>		sport		Regional	Unofficial PAMS	
Hydrocarbon		ind Background		<u> </u>		
Air Toxics	Welf	are Related Impacts				
$\Box$ CO (trace-level)						
Probe inlet height (from ground) 2-15 m? Yes 🛛 No 🗌 Give actual measured height from ground (meters) <u>3.87</u>						
Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes 🗌 No 🔀						
Actual measured distance from outer edge of probe to supporting structure (meters) Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes $\square$ No $\square$ NA $\square$						
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 🛛						
*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 🔲						
Distance of probe to nearest traffic lane (m) $45$ Direction from probe to nearest traffic lane N						

#### **Site Information**

DA 2015 Site Review

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Parameters	Monitoring Objective	Scale	Site Type			
NA NA	General/Background	Micro	SLAMS TEOM PM10-25 FRM			
Air flow < 200 L/min □ PM2.5 FRM	Highest Concentration	Middle	PM10-25 BAM			
PM10 FRM			SPM			
PM10 Cont. (BAM)	Population Exposure <u>TEOM</u>	Neighborhood				
PM10-2.5 FRM	PM10-25 FRM PM10-25 BAM	TEOM PM10-25	Monitor Network Affiliation			
X PM10-2.5 BAM	Source Oriented	FRM PM10-25	NCORE			
PM10 Lead (PB)	Transport	BAM	SUPPLEMENTAL SPECIATION			
PM2.5 Cont. (TEOM) PM2.5 Cont. (BAM)	Welfare Related Impacts	Urban				
$\square$ PM2.5 Spec. (SASS)		Regional	Monitor NAAQS Exclusion			
PM2.5 Spec. (URG)						
PM2.5 Cont. Spec.			NONREGULATORY			
	$(ound) \square < 2 m \_ 2-7$		> 15 m			
	from probe inlet to ground (meters					
	from outer edge of probe inlet to s		The term of roof) supporting structure $> 2 \text{ m}$ ? The terms) $3.0$ Yes $\square$ No $\square$			
	r edge of probe inlets of any low		av other law			
volume monitor at the site			Yes No NA			
	r edge of all low volume monitor	inlets and any Hi-Vol	ume PM-10 Yes 🛛 No 🗌 NA 🗌			
or TSP inlet = 2 m or great						
	nitors (Two FRMs, FRM & BAM	, FRM & *Yes	🗙 (answer *'d questions) No 🗌 NA 🗌			
TEOM, BAM & TEOM) I	located at Site? ollocated PM 2.5 samplers (X) wi					
each other?	bilocated PM 2.5 samplers (X) wi		Ves 🛛 No 🗌 Give actual (meters) <u>2.1</u>			
	npler inlets within 1 m vertically		Tes $\boxtimes$ No $\square$ Give actual (meters) $\underline{2.1}$			
Is an URG 3000 monitor c	ollocated with a SASS monitor at	the site? *Yes 🗌 (	answer *'d questions) No 🛛 NA 🗍			
* Entire inlet opening of co	ollocated speciation samplers inle					
Give actual (meters)						
* Are collocated speciation sampler inlets within 1 m vertically of each other? Yes No Give actual (meters)						
site to measure PM10-2.5?	Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the *Yes (answer *'d questions) No 🛛 NA					
* Entire inlat opening of collocated DM10 and DM2 Scomplars for DM10.2.5 (X) within						
2 to 4 m of each other?						
*Are collocated PM10 and	PM2.5 sampler inlets within 1 m	vertically of each oth	er? Yes No			
Is probe $> 20$ m from the n	earest tree drip line? Yes 🛛	*No 🔲 (answer *'d d	questions)			
*Is probe > 10 m from the nearest tree drip line? Yes *No *No *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 qu					
			be inlet to obstacle			
*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						
Distance of probe to nearest traffic lane (m) $45$ Direction from probe to nearest traffic lane N						
RECOMMENDATIONS						
1) Maintain current site status? Yes X *No (answer *'d questions)						
*2) Change monitoring objective? Yes (enter new objective ) No - No -						
*3) Change scale of representativeness? Yes $\Box$ (enter new scale $\Box$ ) No $\boxtimes$						
*4) Relocate site? Yes No 🛛						
Comments: The Durham Armory is going to have construction activity in the future. There is no activity schedule yet. The						
Armory is working with DAQ to attempt to accommodate the sampling station and meet EPA siting requirements. This						
may or may not be possible. DAQ may have to relocate the site, but would prefer not. No probes are on the top of the						
building in 2015.						
Date of Last Site Pictures	<u>11/17/2014</u> New Pictures	Submitted? Yes 🗌	No 🛛			
Reviewer <u>Roy Doster</u>	1' , 1, 1, 1, 1		Date <u>11/5/2015</u>			
Ambient Monitoring Coordinator <u>Rik Tebeau</u> Date <u>November 19, 2015</u>						

DA 2015 Site Review

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Region RRO	Site Name Bushy Fork			AQS Site # 37- <u>145-0003</u>		
Street Address-NC Highway 49				City Roxboro, NC		
Urban Area ROXBO	RO	Core-ba	sed Stati	istical Area Durham, NC		
	<b>Enter Exact</b>					
Longitude79.09	<u>22</u> Lat	titude <u>3</u>	<u>6.3069</u>	69 Method of Measuring		
In Decimal Degrees	In I	Decimal Degrees		<b>Explanation:</b> <u>Google Earth</u>		
Elevation Above/below N	Mean Sea Level	(in meters)		2	00.00	
Name of nearest road to	inlet probe <u>Nc</u>	<u>Hwy. 49</u> ADT <u>3</u>	<u>300</u> Year	latest available 2014		
Distance of ozone probe	to nearest traffi	c lane (m) <u>180</u> D	irection fr	om ozone probe to near	rest traffic lane SSE	
Comments:						
Name of nearest major ro	oad <u>NC Hwy.</u>	<u>49</u> ADT <u>3300</u> Y	ear latest	available 2014		
Distance of site to neares	t major road (m	n) <u>180.00</u> Direct	ion from s	site to nearest major roa	ud <u>SSE</u>	
Comments:	Comments:					
Site located near electrical substation/high voltage power lines? Yes No 🛛					Yes 🗌 No 🛛	
Distance of site to nearest railroad track (m)Direction to RR MA					RR 🛛 🕅 NA	
Distance of site to nearest power pole w/transformer (m) Direction						
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, fast food restaurants, and swimming pools.						

### **Site Information**

ANSWER ALL APPLICABLE QUESTIONS:					
Parameters	Monitoring Objective	Scale	Site Type		
$\bigcirc$ O <sub>3</sub>	General/Background	Micro	SLAMS		
	Max O3 Concentration	☐Middle	SPM		
	Population Exposure	Neighborhood			
	Source Oriented	⊠Urban			
	Upwind Background	Regional			
Probe inlet height	(from ground) 2-15 m? Yes	No 🗌			
Give actual measu	ared height from ground (meters	) <u>4.00</u>			
Distance of outer	edge of probe inlet from horizon	ntal (wall) and/or vertical (re	oof) supporting		
structure $> 1 \text{ m}$ ? Yes $\square$ No $\square$					
Actual measured distance from outer edge of probe to supporting structure (meters) 1.50					
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					

<b>RECOMMENDATIONS:</b>
-------------------------

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:
Date of Last Site Pictures: <u>November 4, 2015</u> New Pictures Submitted? Yes No
Reviewer KLT Date: November 20, 2015
Ambient Monitoring Coordinator RAT   Date: December 3, 2015

#### 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.

Joette Stegen

BF 2015 Site Review

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3

Region_RRO         Site Name Butner			AQS Site # 37- <u>077</u> - <u>0001</u>		
Street Address-800 Cent	City Butner				
Urban Area BUTNER Core-based Stat			tistical Area None		
Enter Exact					
Longitude <u>-78.7681</u>	l Latitude	<u>36.1412</u>	Method of Measuring		
In Decimal Degrees	In Decima	al Degrees	Interpolation	Explanation:	<u>Orthophoto</u>
Elevation Above/below M	fean Sea Level (in	meters)		<u>129.00</u>	
Name of nearest road to in	nlet probe West G	St. (No Traffic Co	unt Available)	ADT	Year
latest available					
Distance of ozone probe to	o nearest traffic lar	e (m) <u>88</u> Direction	from ozone prob	e to nearest tra	ffic lane <u>SE</u>
Comments: Distance and	direction to West	<u>G St.</u>			
Name of nearest major roa	ad <u>I-85</u> ADT <u>320</u>	000 Year latest ava	ailable <u>2014</u>		
Distance of site to nearest	major road (m) 2	800.00 Direction f	rom site to neares	st major road <u>S</u>	<u>SE</u>
Comments:					
Site located near electrical substation/high voltage power lines? Yes 🗌 No 🔀					
Distance of site to nearest railroad track (m) <u>1875</u> Direction to RR <u>NE</u> NA					NA
Distance of site to nearest power pole w/transformer (m) <u>58</u> Direction <u>SSW</u>					
Distance between site and drip line of water tower (m) 245 Direction from site to water tower NE					
Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks,					
construction activities, fast food restaurants, and swimming pools.					
Location is wastewater treatment plant					
ANSWER ALL APPLICABLE OUESTIONS					

### Site Information

#### ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Site Type		
$\bigcirc$ O <sub>3</sub>	General/Background	Micro	SLAMS		
	Highest Concentration	Middle	SPM		
	Population Exposure	Neighborhood			
	Source Oriented	⊠Urban			
	Upwind Background	Regional			
Probe inlet height	(from ground) 2-15 m? Yes	No 🗌			
Give actual measu	ared height from ground (meters	) <u>4.00</u>			
Distance of outer	edge of probe inlet from horizon	ntal (wall) and/or vertical (re	oof) supporting		
structure $> 1 \text{ m}$ ? Yes $\boxtimes$ No					
Actual measured distance from outer edge of probe to supporting structure (meters) 1.50					
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 $\square$ *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 $\Box$ (answer *'d questions) No $\boxtimes$					
*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					

BT 2015 Site Review

**RECOMMENDATIONS:** 

1) Maintain current site status? Yes 🛛 *No 🗌 (answer *'d que	stions)				
*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:					
Date of Last Site Pictures: <u>November 3, 2014</u> New Pictures Submitt	ed? Yes 🗌 No 🔀				
Reviewer Jimmy Reske	Date: <u>December 2, 2015</u>				
Ambient Monitoring Coordinator Rik Tebeau	Date: December 3, 2015				

#### 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.

Joette Stegen

BT 2015 Site Review

Revised 2016-02-12

	<u> </u>						
Region RRO Site Name JW-West Johnson			AQS Site # 37- <u>101-0002</u>				
Street Address-1338 Jack Road				City <u>Clavton</u>			
Urban Area CLAYTON Core-based Sta			atistical Area	Raleigh, NC	2		
	Enter E	xact					
Longitude -78.46	22	Latitude	<u>35.5909</u>	5	N	lethod of M	leasuring
In Decimal Degrees		In Decimal	Degrees		<b>Interpolation</b>	Explanation	on: <u>Google Maps</u>
Elevation Above/below			,			<u>82</u>	
Name of nearest road to in	let probe	lack Rd (SR 1	<u>557)</u> ADT <u>1</u>	700 Y	ear latest availab	le <u>2013</u>	
Comments: None							
Distance of site to nearest	major road	(m) <u>2010.00</u>	Direction fro	om site	e to nearest major	road <u>NNE</u>	
Name of nearest major roa	d US Hig	hway 70 Byp	ass ADT 250	000 Ye	ear <u>2014</u>		
Comments: None							
Site located near electrical	substation	/high voltage	power lines?				Yes 🔲 No 🛛
Distance of site to nearest railroad track       (m) Direction to RR NA         Distance of site to nearest power pole w/transformer       (m) Direction N					NA		
Distance between site and drip line of water tower (m)Direct				()			NA
Explain any sources of p construction activities, f	otential b	ias; include	cultivated fie	elds, 1	oose bulk storag		nts, railroad tracks,

### **Site Information**

Parameters	Monitoring Objective	Scale	Monitor Type
<ul> <li>NA</li> <li>SO<sub>2</sub> (NAAQS)</li> <li>SO<sub>2</sub> (trace-level)</li> <li>NO<sub>x</sub> (NAAQS)</li> <li>HSNO<sub>y</sub></li> <li>O<sub>3</sub></li> <li>NH<sub>3</sub></li> <li>Hydrocarbon</li> <li>Air Toxics</li> <li>HSCO (Not Micro)</li> <li>CO (trace-level)</li> </ul>	General/Background Highest Concentration Max O3 Concentration Population Exposure Source Oriented Transport Upwind Background Welfare Related Impacts	Micro Middle Neighborhood Urban Regional	SLAMS SPM Monitor Network Affiliation NCORE Unofficial PAMS
Distance of outer edge of p Actual measured distance	round) 2-15 m? Yes No No probe inlet from horizontal (wall) and/ from outer edge of probe to supporting probe inlet from other monitoring prob	or vertical (roof) supporting g structure (meters) 0.80	
	nearest tree drip line? Yes 🛛 *No		
-	nearest tree drip line? Yes 🗌 *No ee (m) Direction from probe		e (m)
Are there any obstacles to	air flow? *Yes 🔲 (answer *'d question	ons) No 🛛	
*Is distance from inlet pro	Distance from probe inlet (m)	that the obstacle protrudes	above the probe? Yes 🗌 No 🗌
Distance of probe to neare	st traffic lane (m) 20 Direction from	n probe to nearest traffic lar	ne <u>SW</u>

Parameters	Monitoring Objective	Scale	Monitor Type		
🛛 NA	General/Background				
□ NO <sub>y</sub> (trace-level)	Highest Concentration	Micro Middle	SLAMS		
	Max O3 Concentration	Neighborhood	SPM		
	Population Exposure	Urban			
	Source Oriented	Regional	Monitor Network Affiliation		
	Transport		NCORE		
	Upwind Background				
	Welfare Related Impacts				
Probe inlet height (from g Actual measured distance	ground) 10-15 m? Yes 🗌 No 🔲 from probe inlet to ground (meters) _				
Distance of outer edge of	probe inlet from horizontal and/or ver	tical supporting structure >	1 m? Yes 🗌 No 🗌		
Actual measured distance	from outer edge of probe inlet to supp	oorting structure (meters)			
Distance of outer edge of	probe inlet from other monitoring prol	be inlets > 1 m?	Yes 🗌 No 🗌 NA 🗌		
Is probe > 20 m from the	nearest tree drip line? Yes 🔲 *N	o 🗌 (answer *'d questions	)		
*Is probe > 10 m from the	e nearest tree drip line? Yes 🗌 *N	o 🗌			
*Distance from probe to t	ree (m) Direction from probe	to tree *Height of tre	e (m)		
Are there any obstacles to	air flow? *Yes 🗌 (answer *'d questi	ons) No 🗖			
*Identify obstacle	Distance from probe inlet (m)	_Direction from probe inlet	to obstacle		
	obe to obstacle at least twice the height				
Distance of probe to nearest traffic lane (m) Direction from probe to nearest traffic lane					
Parameters	Monitoring Objective	Scale	Monitor Type		
Parameters					
Parameters	Monitoring Objective	Scale	Monitor Type		
Parameters NA Air flow > 200 L/min □ PM10 □ TSP	Monitoring Objective	Scale	Monitor Type		
Parameters NA Air flow > 200 L/min □ PM10	Monitoring Objective Highest Concentration Population Exposure	Scale          Micro         Middle         Neighborhood	Monitor Type		
Parameters NA Air flow > 200 L/min □ PM10 □ TSP	Monitoring Objective          Highest Concentration         Population Exposure         Source Oriented         Background         Transport	Scale Micro Middle Neighborhood Urban	Monitor Type		
Parameters NA Air flow > 200 L/min □ PM10 □ TSP	Monitoring Objective          Highest Concentration         Population Exposure         Source Oriented         Background	Scale Micro Middle Neighborhood Urban	Monitor Type          SLAMS         SPM         Monitor Network Affiliation		
Parameters NA Air flow > 200 L/min □ PM10 □ TSP □ TSP Pb	Monitoring Objective          Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts	Scale          Micro         Middle         Neighborhood         Urban         Regional	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE		
Parameters	Monitoring Objective          Highest Concentration         Population Exposure         Source Oriented         Background         Transport	Scale          Micro         Middle         Neighborhood         Urban         Regional         7-15 m	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE		
Parameters          NA         Air flow > 200 L/min         PM10         TSP         TSP Pb         Probe inlet height (from g Actual measured distance	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m 2-7m	Scale          Micro         Middle         Neighborhood         Urban         Regional         7-15 m	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m		
Parameters	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale          Micro         Middle         Neighborhood         Urban         Regional         7-15 m         /or vertical (platform or roo	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m		
Parameters NA Air flow > 200 L/min □ PM10 □ TSP □ TSP Pb Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale Micro Middle Neighborhood Urban Regional 7-15 m /or vertical (platform or roo eters)	Monitor Type		
Parameters	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale          Micro         Middle         Middle         Weighborhood         Urban         Regional         7-15 m         /or vertical (platform or roo eters)         lers (X) within 2 to 4 m of or set to 4 m of or set to 4 m of or set to 4 m of to 5 million and 5 mil	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes No         Yes No         wach other? Yes No NA		
Parameters	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m 2-7m	Scale Micro Middle Neighborhood Urban Urban Regional /or vertical (platform or roo eters) lers (X) within 2 to 4 m of c both (all) collocated probe	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes         Yes         No         each other? Yes         No		
Parameters	Monitoring Objective     Highest Concentration     Population Exposure     Source Oriented     Background     Transport     Welfare Related Impacts     welfare Related Impacts     ground)	Scale Micro Middle Neighborhood Urban Urban Regional /or vertical (platform or roo eters) lers (X) within 2 to 4 m of c both (all) collocated probe	Monitor Type         SLAMS		
Parameters NA Air flow > 200 L/min □ PM10 □ TSP □ TSP Pb Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance Distance (Y) between out	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale Micro Middle Neighborhood Urban Urban Regional /or vertical (platform or roo neters) lers (X) within 2 to 4 m of c both (all) collocated probe	Monitor Type         SLAMS		
Parameters NA Air flow > 200 L/min □ PM10 □ TSP □ TSP Pb Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance Distance (Y) between out Is probe > 20 m from the *Is probe > 10 m from the *Distance from probe to to	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale         Micro         Middle         Neighborhood         Urban         Regional         7-15 m         /or vertical (platform or roo         eters)         lers (X) within 2 to 4 m of co         both (all) collocated probe         my other high or low volume         o         to tree*Height of tree	Monitor Type         SLAMS         SPM         SPM         Monitor Network Affiliation         NCORE         > 15 m         > 15 m         f) supporting structure > 2 m? Yes         Yes         No         cach other? Yes         No         inlets (meters)         e inlet ≥ 2 m?Yes		
Parameters NA Air flow > 200 L/min □ PM10 □ TSP □ TSP Pb Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance Distance (Y) between out Is probe > 20 m from the *Is probe > 10 m from the *Distance from probe to the Are there any obstacles to	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m 2-7m	Scale         Micro         Middle         Neighborhood         Urban         Regional         Regional         /or vertical (platform or roo         ieters)         lers (X) within 2 to 4 m of c         both (all) collocated probe         iny other high or low volum         o (answer *'d questions)         o (answer *'Height of tre         ons) No	Monitor Type         SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes         Yes         No         e inlet ≥ 2 m?Yes         inlets (meters)         e inlet ≥ 2 m?Yes		
Parameters  NA Air flow > 200 L/min PM10 TSP TSP Pb  Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance Distance (Y) between out Is probe > 20 m from the *Is probe > 10 m from the *Distance from probe to th Are there any obstacles to *Identify obstacle	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m 2-7m	Scale         Micro         Middle         Neighborhood         Urban         Regional         Regional         /or vertical (platform or roo         ieters)         /or vertical (platform or roo         ieters)         (answer *'d questions)         (answer *'d questions)      (	Monitor Type         SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes         Yes         No         ach other? Yes         winlets (meters)            e inlet ≥ 2 m?Yes         o obstacle		
Parameters      Air flow > 200 L/min     PM10     TSP     TSP Pb      Probe inlet height (from g     Actual measured distance     Distance of outer edge of     Actual measured distance     Distance (Y) between out     Is probe > 20 m from the     *Is probe > 10 m from the     *Distance from probe to the     Are there any obstacles to     *Identify obstacle	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         welfare Related Impacts         pround)       < 2 m	Scale         Micro         Middle         Neighborhood         Urban         Regional         Regional         /or vertical (platform or roo         ieters)         /or vertical (platform or roo         ieters)         (answer *'d questions)         (answer *'d questions)      (	Monitor Type $SLAMS$		

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			_	work Affiliation
PM10 Cont. (BAM)	Population Exposure	Neighborhood		
PM10-2.5 FRM	Source Oriented		NCORE	
PM10-2.5 BAM	Transport	Urban	SUPPLE	MENTAL SPECIATION
PM10 Lead (PB) PM2.5 Cont.	Welfare Related Impacts	Regional	<b>—</b>	
(TEOM)			Monitor NA	AQS Exclusion
PM2.5 Cont. (BAM)				-
PM2.5 Spec. (SASS)			I NONREO	GULATORY
PM2.5 Spec. (URG)				
PM2.5 Cont. Spec.	ground) 🔲 < 2 m 🛛 2	-7m 7-15 m		>15 m
	e from probe inlet to ground (mete			
	probe inlet from horizontal (wall		rm or roof) su	pporting structure > 2 m?
	e from outer edge of probe inlet to			Yes 🛛 No 🗌
	ter edge of probe inlets of any low	volume monitor and a	ny other	Yes 🗌 No 🗌 NA 🛛
low volume monitor at the	ter edge of all low volume monito	r inlate and any Hi Vol	ma DM 10	
or TSP inlet = $2 \text{ m or gre}$		i fillets and any fil- vol	unie Fivi-io	Yes 🗌 No 🗌 NA 🗙
	onitors (Two FRMs, FRM & BAN	VL FRM &		
TEOM, BAM & TEOM)	Located at Site?	* Y es	(answer *	'd questions) No 🛛 NA
	collocated PM 2.5 samplers (X) w			~
each other?	amalar inlata within 1 m vartically			Give actual (meters)
	ampler inlets within 1 m vertically collocated with a SASS monitor			
	collocated speciation samplers inl			
Give actual (meters)				
	on sampler inlets within 1 m verti		'es 🗌 No 🗌	Give actual (meters)
	ionitor collocated with a PM2.5 m	ionitor at the *Ye	s 🗌 (answer	*'d questions) No 🛛 NA
site to measure PM10-2.4	collocated PM10 and PM2.5samp		within	
2 to 4 m of each other?	conceated i wiro and i wiz.5samp	101510111110-2.5 (21) 1	Yes	No 🗌
	nd PM2.5 sampler inlets within 1 i	m vertically of each oth	er? Yes	No 🗌
Is probe > 20 m from the	nearest tree drip line? Yes 🛛	*No 🗌 (answer *'d d	questions)	
*Is probe > 10 m from th	e nearest tree drip line? Yes	*No		
*Distance from probe to	tree (m) Direction from p	probe to tree *Heig	ght of tree (m)	·
	o air flow? *Yes 🗌 (answer *'d c	• · · · · · · · · · · · · · · · · · · ·		
*Identify obstacle	Distance from probe inlet (m)	Direction from pro	be inlet to obs	stacle
	obe to obstacle at least twice the h			
	est traffic lane (m) Dire	ction from probe to nea	rest trainc lan	
RECOMMENDATIONS:				
<ol> <li>Maintain current site s</li> </ol>	0	er *'d questions)		
	bjective? Yes 🗌 (enter new ob			
	esentativeness? Yes 🗌 (enter r 🔲 No 🗙	new scale _) No	<b>_</b>	
,				
Comments: None				
Date of Last Site Pictures	10/22/14 New Pictures St	ubmitted? Yes 🗌 No	$\boxtimes$	
Reviewer Roy Doster				Date November 5, 2015
Ambient Monitoring Coor	rdinator <u>Rik Tebeau</u>		Date	November 9, 2015

#### Site Name Millbrook Region RRO AQS Site # 37-183-0014 Street Address-3801 Spring Forest Road City Raleigh Urban Area RALEIGH Core-based Statistical Area Raleigh, NC **Enter Exact** -78.574167 Latitude 35.85611 Longitude Method of Measuring In Decimal Degrees In Decimal Degrees GPS Explanation: GPS Elevation Above/below Mean Sea Level (in meters) 90 Name of nearest road to inlet probe Spring Forest Road ADT 18000 Year latest available 2013 Comments: As of 11/4/15, 2013 is the most recent AADT. Spring Forest Road is 40m South of the site buildings. Distance of site to nearest major road (m) 614.00 Direction from site to nearest major road W Name of nearest major road Capital Blvd/Hwy 1 ADT 49000 Year 2014 Comments: Site located near electrical substation/high voltage power lines? No 🗙 Yes NA Distance of site to nearest railroad track (m) Direction to RR

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,

(m)

Direction N

NA

### Site Information

#### ANSWER ALL APPLICABLE QUESTIONS:

Distance of site to nearest power pole w/transformer

construction activities, fast food restaurants, and swimming pools.

Parameters	Monitoring Objective	Scale	Monitor Type		
<ul> <li>NA</li> <li>SO<sub>2</sub> (NAAQS)</li> <li>SO<sub>2</sub> (trace-level)</li> <li>NO<sub>x</sub> (NAAQS)</li> <li>HSNO<sub>y</sub></li> <li>O<sub>3</sub></li> <li>NH<sub>3</sub></li> <li>Hydrocarbon</li> <li>Air Toxics</li> <li>HSCO (Not Micro)</li> </ul>	General/Background <u>CO</u> Highest Concentration Max O3 Concentration <u>CO, O3</u> Population Exposure <u>CO,SO2,O3</u> Source Oriented Transport Upwind Background Welfare Related Impacts	Micro Middle <u>CO</u> Neighborhood <u>SO2, NO2,O3</u> Urban Regional	SLAMS <u>CO,SO2,NO2,O3</u> SPM Monitor Network Affiliation NCORE <u>CO,SO2,NO2,O3</u> Unofficial PAMS		
☐ H3CO (Not Micro)       ☐ Welfare Related Impacts         ☑ CO (trace-level)       ☐ Welfare Related Impacts         Probe inlet height (from ground) 2-15 m? Yes ☑ No ☐ Give actual measured height from ground (meters)         SO2(4.9),NO2 represented by NOX(5.14),O3(4.9),Hydrocarbons(4.7), Air Toxics-Aldehyde(3.08), CO(4.9)         Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☑ No ☐         Actual measured distance from outer edge of probe to supporting structure (meters) SO2(1.3),NO2 represented by NOX(1.35),O3(1.3),Hydrocarbons(1.3),Air Toxics-Aldehyde(.95), CO(1.3)         Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m?       Yes ☑ No ☐ NA ☐					
Is probe > 20 m from the nearest tree drip line? Yes					
*Identify obstacle tree(as d ENE	ir flow? *Yes (answer *'d questions) <u>lescribed above</u> Distance from probe inle to obstacle at least twice the height that	et (m) <u>see above</u> Direc			
	t traffic lane (m) <u>Air Toxics-Aldehyde (3</u>				

Parameters	Monitoring Objective	Scale	Monitor Type				
□ NA ⊠ NO <sub>y</sub> (trace-level)	General/Background Highest Concentration Max O3 Concentration Population Exposure <u>NOy</u> Source Oriented	Micro Middle NeighborhoodNOy	SLAMS <u>NOy</u> SPM				
	Transport	- Ulrhon	Monitor Network Annation				
	Transport     Urban       Upwind Background     Regional       Welfare Related Impacts     Regional						
	ground) 10-15 m? Yes 🛛 No 🔲 e from probe inlet to ground (meters) <u>10</u>	0.70					
	probe inlet from horizontal and/or ver from outer edge of probe inlet to supp						
	probe inlet from other monitoring pro		Yes 🛛 No 🗌 NA 🗌				
-	nearest tree drip line? Yes 🔲 *N		)				
	e nearest tree drip line? Yes 🛛 *N tree (m) <u>11.40</u> Direction from probe t		ee (m) 33.00				
Are there any obstacles to	o air flow? *Yes 🔲 (answer *'d questi	ons) No 🛛					
*Identify obstacle tree(as	s described above) Distance from prob	e inlet (m) <u>11</u> Direction fro	om probe inlet to obstacle ENE				
	obe to obstacle at least twice the height						
	est traffic lane (m) 40 Direction from						
Parameters	Monitoring Objective	Scale	Monitor Type				
⊠ NA Air flow > 200 L/min □ PM10 □ TSP □ TSP Pb	Highest Concentration Population Exposure Source Oriented Background Transport Welfare Related Impacts	Micro Middle Neighborhood Urban Regional	SLAMS SPM Monitor Network Affiliation				
Probe inlet height (from	ground) $\square < 2 \text{ m} \_ \square 2-7 \text{m}$	7-15 m	□ > 15 m				
	e from probe inlet to ground (meters)						
	probe inlet from horizontal (wall) and from probe to supporting structure (m		f) supporting structure > 2 m? Yes No No				
Entire inlet opening of co	Entire inlet opening of collocated PM-10, TSP or TSP Pb Samplers (X) within 2 to 4 m of each other? Yes 🗌 No 🗌 NA						
Actual measured distance (X) including entire inlet openings of both (all) collocated probe inlets (meters)							
Fictual incasured distance		both (all) collocated probe					
	(X) including entire inlet openings of ter edge of any high volume inlet and a		inlets (meters) e inlet ≥ 2 m? Yes_No_NA_				
Distance (Y) between ou Is probe > 20 m from the *Is probe > 10 m from th *Distance from probe to	e (X) including entire inlet openings of ter edge of any high volume inlet and a nearest tree drip line? Yes *N e nearest tree drip line? Yes *N tree (m) Direction from probe	o (answer *'d questions) to (answer *'d questions) to tree (1997) *Height of tree	inlets (meters) e inlet ≥ 2 m? Yes□No□NA□ )				
Distance (Y) between ou Is probe > 20 m from the *Is probe > 10 m from th *Distance from probe to Are there any obstacles to	e (X) including entire inlet openings of ter edge of any high volume inlet and a nearest tree drip line? Yes *N e nearest tree drip line? Yes *N	iny other high or low volum o (answer *'d questions) o ( to tree *Height of tree ons) No (	inlets (meters) e inlet ≥ 2 m? Yes No NA ) e (m)				

MK 2015 Site Review

Parameters	Monitoring Objective	Scale	Site Type			
NA	General/Background	Micro	SLAMS PM2.5/PM10 FRM,PM2.5/10			
Air flow $< 200 \text{ L/min}$	General/Background		Cont. (BAM)			
PM2.5 FRM PM10 FRM		Middle				
PM10 Cont. (BAM)	Highest Concentration	Neighborhood	SPM_PM2.5 SASS, URG, Cont. Spec.			
PM10-2.5 FRM		PM2.5/PM10, BAM2.5	Monitor Network Affiliation			
🛛 PM10-2.5 BAM	Population Exposure	Urban	NCORE <u>PM2.5/PM10</u>			
PM10 Lead (PB)	PM2.5/PM10, BAM2.5	Regional	FRM.PM2.5/10 Cont. (BAM)			
PM2.5 Cont. (TEOM) PM2.5 Cont. (BAM)	Source Oriented		SUPPLEMENTAL SPECIATION			
PM2.5 Cont. (BAM)	Transport		PM2.5 SASS, URG, Cont. Spec.			
PM2.5 Spec. (URG)			Monitor NAAQS Exclusion			
PM2.5 Cont. Spec.	Welfare Related Impacts		NONREGULATORY			
Probe inlet height (from gr		2-7m 7-15 m				
			M2.5 FRM (2.4), BAM (2.62), PM2.5			
	2.3),PM2.5 Cont. Spec.=(Aeth					
			m or roof) supporting structure $> 2 \text{ m}$ ?			
			eters) <u>PM10 FRM (2.1), PM2.5 FRM</u> .85,NO3 0.85) Yes 🛛 No 🗖			
	r edge of probe inlets of any 1		u other low			
volume monitor at the site		ow volume monitor and an	Yes No NA			
Distance (Y) between outer	r edge of all low volume mon	itor inlets and any Hi-Volu	me PM-10 Yes 🗖 No 🗖 NA 🛛			
or TSP inlet = $2 \text{ m}$ or great	er?	9				
	Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, FRM & *Yes X (answer *'d questions) No NA					
TEOM, BAM & TEOM) L			(			
other?	ollocated PM 2.5 samplers (X	) within 2 to 4 m of each	Yes 🛛 No 🗌 Give actual (meters) <u>4</u>			
*Are collocated PM2.5 san	npler inlets within 1 m vertica	ally of each other?	Yes X No Give actual (meters) 3			
Is an URG 3000 monitor co	ollocated with a SASS monito	or at the site? *Yes 🛛 (a	nswer *'d questions) No 🗌 NA 🗌			
	ollocated speciation samplers	inlets (X) within 2 to 4 m o	f each other? Yes 🛛 No 🗖			
Give actual (meters)2.2		rtically of each other? V	No 🔽 No 🗔 Cive estual (matem)			
	nitor collocated with a PM2.5	monitor of the	es 🛛 No 🗌 Give actual (meters)			
site to measure PM10-2.5?		*Yes	(answer *'d questions) No 🗌 NA 🗌			
	ollocated PM10 and PM2.5sar	mplers for PM10-2.5 (X) w	ithin 2 to 4 m of			
each other?						
	PM2.5 sampler inlets within					
	earest tree drip line? Yes		uestions)			
	nearest tree drip line? Yes		(COL)(26),PM2.5 FRM(27) URG			
	(26),BAM (28) Direction f					
	air flow? *Yes 🗌 (answer *'		······································			
*Identify obstacle D	Distance from probe inlet (m)	Direction from prob	e inlet to obstacle			
			rotrudes above the probe? Yes 🗌 No			
	st traffic lane (m) PM2.5 FR	M(28) Direction from pro	obe to nearest traffic lane <u>S</u>			
RECOMMENDATIONS:	a an ann <b>-</b> anns <b>-</b> a					
1) Maintain current site sta		swer *'d questions)				
<ul><li>*2) Change monitoring ob</li><li>*3) Change scale of repres</li></ul>	ojective? Yes 🗌 (enter new	/ objective) No 🛛 er new scale) No 🕻				
*4) Relocate site? Yes		I new scale No				
<u>Comments:</u>						
Date of Last Site Pictures	11/17/14 New Picture	s Submitted? Yes No	$\times$			
Reviewer Travis Funderbu	rk		Date <u>12/10/15</u>			
Ambient Monitoring Coord	dinator <u>Rik</u> Tebeau		DateDecember 14, 2015			

Region_RRO Site Name Fuquay			AQS Site # 37- <u>183-0016</u>					
Street Address-201 North Broad St.			City Fuquay-	Varina				
Urban Area Not	in an Urban	Area	Core-based	Stat	istical Area 🛛 R	aleigh-Cary, N	С	
	Enter E	xact						
Longitude <u>-78</u>	8.7926	Latitude	35.59	72	N	lethod of Meas	suring	
In Decimal Degrees		In Decima	l Degrees		<b>Interpolation</b>	<b>Explanation:</b>	Orthop	hoto
Elevation Above/be	low Mean Se	a Level (in 1	meters)			<u>126.00</u>		
Name of nearest roa	d to inlet pro	be <u>Bengal I</u>	<u>Blvd.</u> A	DT	1400 Year lates	st available 20	)13	
Distance of ozone p	robe to neares	st traffic lan	e (m) 350 Dir	ectio	n from ozone pro	be to nearest tr	affic lane	• <u>SE</u>
Comments:								
Name of nearest ma	jor road NC	HWY 55 A	DT <u>1400</u> Ye	ar la	atest available	2013		
Distance of site to n	earest major i	road (m) 4:	50.00 Directio	on fro	om site to nearest	major road SV	W	
Comments:								
Site located near ele	ctrical substa	tion/high vo	ltage power li	ines?			Yes 🗌	No 🛛
Distance of site to n	earest railroa	d track		(m)	Direc	ction to RR	. 🛛 N	A
Distance of site to nearest power pole w/transformer (m) Direction								
					<b>⊠</b> NA			
Explain any sources	of potential l	oias; include	cultivated fie	elds,	loose bulk storag	e, stacks, vents.	, railroad	tracks,
construction activiti	es, fast food r	estaurants,	and swimming	g poo	ols.			

### Site Information

Parameters	Monitoring Objective	Scale	Site Type	
$\Box$ O <sub>3</sub>	General/Background	Micro	<b>SLAMS</b>	
	Highest Concentration	☐Middle	ØSPM	
	Population Exposure	Neighborhood		
	Source Oriented	Urban		
	Upwind Background	Regional		
Probe inlet height	(from ground) 2-15 m? Yes	🛾 No 🗌		
Give actual measu	ared height from ground (meters	)		
Distance of outer	edge of probe inlet from horizon	ntal (wall) and/or vertical (re	oof) supporting	
structure > 1 m? Y	í es 🛛 No 🗌			
Actual measured	distance from outer edge of prob	e to supporting structure (m	neters) <u>1.50</u>	
Is probe $> 20 \text{ m fr}$	rom the nearest tree drip line?	Yes 🛛 *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 (r inlet probe to obstacle at least tw 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 🗌 No 🔀						
Comments: Site to be shut-down in 2015.						
Date of Last Site Pictures: 2014 New Pictures Submitted? Yes No						
Reviewer C. Marshall Cannon Date: December 7, 2015						
Ambient Monitoring Coordinator RAT         Date: December 8, 2015						

#### 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.

Region_RRO         Site Name Franklinton			AQS Site # 37- <u>069</u> - <u>0001</u>			
Street Address-Howard Harris Rd.			City Franklin	ton		
Urban Area RALE	EIGH	Core-ba	sed Stat	istical Area 🛛 R	aleigh-Cary,	NC
	Enter Exact					
Longitude -78.4	1638 Lat	itude <u>3</u>	5.096 <u>1</u>	Ν	fethod of Me	asuring
In Decimal Degrees	In I	Decimal Degrees		<b>Interpolation</b>	Explanation	n: <u>Google Earth</u>
Elevation Above/below	w Mean Sea Lev	vel (in meters)			<u>177.00</u>	
Name of nearest road	to inlet probe H	loward Harris Ro	l. ADT	0 Year latest av	ailable	_
Distance of ozone prol	be to nearest tra	ffic lane (m) <u>87</u> l	Direction	from ozone prob	be to nearest th	raffic lane <u>E</u>
Comments:						
Name of nearest major	r road <u>US 1</u> AI	DTYear	latest av	ailable		
Distance of site to near	rest major road	(m) 486.00 Dire	ection fro	om site to nearest	major road	E
Comments:						
Site located near electr	rical substation/	high voltage pow	er lines			Yes 🗌 No 🛛
Distance of site to near	rest railroad trac	k	(m)	Direc	ction to RR	NA
Distance of site to near	rest power pole	w/transformer	(m)	Direc	ction	
Distance between site	and drip line of	water tower (m)	I	irection from site	e to water tow	/erNA
Explain any sources of	f potential bias;	include cultivate	d fields,	loose bulk storag	e, stacks, ven	ts, railroad tracks,
construction activities,	, fast food restau	trants, and swim	ming poo	ols.		

### Site Information

Parameters	Monitoring Objective	Scale	Site Type			
$\Box$ O <sub>3</sub>	General/Background	Micro	<b>SLAMS</b>			
	Highest Concentration Max O3 Concentration	Middle	ПSPM			
	Population Exposure	Neighborhood				
	Source Oriented	⊠Urban				
	Upwind Background	Regional				
Probe inlet height	Probe inlet height (from ground) 2-15 m? Yes 🛛 No					
Give actual measured height from ground (meters) 3.50						
Distance of outer	Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting					
structure $> 1 \text{ m}$ ? Yes $\boxtimes$ No						
Actual measured	Actual measured distance from outer edge of probe to supporting structure (meters) 1.10					
Is probe > 20 m from the nearest tree drip line? Yes $\times$ *No $\square$ (answer *'d questions)						
*Is probe $> 10 \text{ m}$	*Is probe $> 10$ m from the nearest tree drip line? Yes $\checkmark$ *No $\checkmark$					
*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 (r inlet probe to obstacle at least tw No					

<u>RECOMMENDATIONS:</u>	
1) Maintain current site status? Yes 🗌 *No 🛛 (answer *'d questions)	
*2) Change monitoring objective? Yes [ (enter new objective:) N	lo 🛛
*3) Change scale of representativeness? Yes 🗌 (enter new scale: ) No	
*4) Relocate site? Yes 🗌 No 🔀	
Comments: Franklinton site to be shut-down in 2015.	
Date of Last Site Pictures: $11/3/14$ New Pictures Submitted? Yes $\square$ No	1
Reviewer KLTDate: M	November 20, 2015
Ambient Monitoring Coordinator <u>RAT</u> Date:	December 3, 2015

#### 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.

Degion BBO St	to Nome Triple	Site informat		Site # 27 192 0021	
Region         RRO         Site Name Triple Oak           Street Address-2826 Triple Oak Road,			AQS Site # 37- <u>183-0021</u>		
			City <u>Cary-ETJ (Morrisville)</u>		
Urban Area RALEIGH		Core-based Sta	atistical Area Ra	lleigh, NC	
	er Exact				
Longitude <u>-78.81965</u>				thod of Measuring	
In Decimal Degrees	In Decim		<b>Interpolation</b>	Explanation: <u>orthophoto</u>	
Elevation Above/below Mean Sea Level (in meters) <u>96</u>					
Name of nearest road to in				<u>14</u>	
Comments: Nearest road					
Distance of site to nearest				rest major road <u>SW</u>	
Name of nearest major roa					
				ne site, available 2014 data	
indicates an average daily					
Site located near electrical				Yes No 🛛	
Distance of site to nearest			·	ection to RR NA	
Distance of site to nearest	<u> </u>			ection	
Distance between site and di			Direction from site		
				torage, stacks, vents, railroad	
tracks, construction activity	ties, fast food re	estaurants, and sv	vimming pools.		
1.9 km to NE-RDU airpor	t runway. 320n	n to S-Triangle Fa	actory Shops mal	1. 650m to N-multiple	
distribution warehouses. 6	20m to SE-I40	exit #284 (Airpo	rt Blvd) multiple	hotels and restauraunts. 1.3km	
to NW-I40 exit #283 (I-54	<u>40).</u>	8 92 <sup>7</sup>	52 - 157A.		
Parameters		g Objective	Scale	Monitor Type	
NO2 (Near Road only)	Highest Conc		Micro	SLAMS	
CO (Near Road only)	Population E:				
	Source Orien	ted		SPM	
	Welfare Relat	ed Impacts			
Probe inlet height (from ground			ive actual measured	height from ground (meters) 4.20	
Distance of outer edge of prob	e inlet from horizo	ntal (wall) and/or ve	rtical (roof) supporti	ng structure > 1 m? Yes 🛛 No 🗌	
Actual measured distance from					
Distance of outer edge of prob Is probe $> 20$ m from the neare	e inlet from other i	Vas No No	ets > 0.25 m? (opewar *'d quastion	Yes 🛛 No 🗌 NA 🗌	
*Is probe $> 10$ m from the near	rest tree drip line?	Yes No X	(answer a question	15)	
*Distance from probe to tree (1	m) 8.00 Direction	n from probe to tree	N *Height of tree (	(m) <u>35.00</u>	
Are there any obstacles to air f					
*Identify obstacle tree line run	uning parallel to in	terstate Distance fro	m probe inlet (m) <u>8</u>	Direction from probe inlet to	
obstacle <u>N</u> *Is distance from inlet probe to	obetacle at least t	wice the height that	the obstacle protrude	as above the proba? Vas 🗖 . No 🕅	
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes $\square$ No $\boxtimes$ Distance of probe to nearest traffic lane (m) 20 Direction from probe to nearest traffic lane SW					
RECOMMENDATIONS:					
1) Maintain current site status	1) Maintain current site status? Yes X *No □ (answer *'d questions)				
*2) Change monitoring object	ive? Yes 🗌 (en	ter new objective	) No 🗖 -		
*3) Change scale of representation		(enter new scale	_) No 🗖		
*4) Relocate site? Yes	No 🔲				
Comments:	0014 N. P.	0.1			
Date of Last Site Pictures Reviewer Tim Skelding	2014 New Pict	ures Submitted? Yes	No 🛛	DateDecember 11, 2015	
Ambient Monitoring Coordina	tor <u>RAT</u>			DateDecember 11, 2015	

Site Information

TO 2015 Site Review

Region_RRO         Site Name Leggett			A	QS Site # 37-	<u>065-0099</u>	
Street Address-7589 NC 33 NW			City Tarbor	2		
Urban Area	Not in an Urban	Area	Core-based St	atistical Area	Rocky Mount,	, NC
	Enter E	xact				
Longitude	<u>-77.584358</u>	Latitude	<u>35.988278</u>	N	lethod of Mea	asuring
In Decimal Degr	rees	In Decimal	Degrees	<b>Interpolation</b>	Explanation	1: Othophoto
Elevation Abo	ve/below Mean Sea	a Level (in 1	meters)		<u>20</u>	
Name of nearest	road to inlet probe 1	NC 97 ADT	2500 Year latest a	vailable <u>2014</u>		
Comments:	_					
Distance of site	to nearest major road	(m) <u>92.00</u> I	Direction from site	o nearest major ro	ad <u>SSE</u>	
Name of nearest major road NC 33 ADT 3500 Year 2014						
Comments:						
Site located near	electrical substation	/high voltage	power lines?			Yes 🔲 No 🛛
Distance of site to nearest railroad track       (m) Direction to RR NA         Distance of site to nearest power pole w/transformer       (m) Direction N						
Distance betwee	Distance between site and drip line of water tower (m) Direction from site to water tower NA					
	urces of potential b				ge, stacks, vents	, railroad tracks,
construction ac	tivities, fast food re	estaurants, a	nd swimming poo	ols.		
NA						

### Site Information

#### ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type			
<ul> <li>NA</li> <li>SO<sub>2</sub> (NAAQS)</li> <li>SO<sub>2</sub> (trace-level)</li> <li>NO<sub>x</sub> (NAAQS)</li> <li>HSNO<sub>y</sub></li> <li>O<sub>3</sub></li> <li>NH<sub>3</sub></li> <li>Hydrocarbon</li> <li>Air Toxics</li> <li>HSCO (Not Micro)</li> <li>CO (trace-level)</li> </ul>	General/Background Highest Concentration Max O3 Concentration Population Exposure Source Oriented Transport Upwind Background Welfare Related Impacts	Micro Middle Neighborhood Urban Regional	SLAMS SPM Monitor Network Affiliation NCORE Unofficial PAMS			
Probe inlet height (from gr	round) 2-15 m? Yes 🛛 No 🗌	Give actual measured heig	ht from ground (meters) 2.50			
	brobe inlet from horizontal (wall) and/ from outer edge of probe to supporting		g structure ≥ 1 m? Yes 🛛 No			
Distance of outer edge of p	probe inlet from other monitoring prob	be inlets > 1 m?	Yes 🗌 No 🛛 NA 🗌			
Is probe $> 20$ m from the n	Is probe > 20 m from the nearest tree drip line? Yes $\boxtimes$ *No $\square$ (answer *'d questions)					
*Is probe $> 10$ m from the	*Is probe > 10 m from the nearest tree drip line? Yes $\square$ *No $\square$					
	ee (m) Direction from probe		e (m)			
Are there any obstacles to air flow? *Yes 🗌 (answer *'d questions) No 🛛						
*Identify obstacle	*Identify obstacle Distance from probe inlet (m)Direction from probe inlet to obstacle					
*Is distance from inlet pro	be to obstacle at least twice the height	t that the obstacle protrudes	above the probe? Yes 🗌 No			
Distance of probe to neare	st traffic lane (m) <u>92</u> Direction from	m probe to nearest traffic lar	ne <u>SSE</u>			

LG 21015 Site Review

Parameters	Monitoring Objective	Scale	Monitor Type
🛛 NA	General/Background	Micro	SLAMS
NO <sub>y</sub> (trace-level)	Highest Concentration	Middle	
	Max O3 Concentration	Neighborhood	SPM
	Population Exposure	Urban	
	Source Oriented	Regional	Monitor Network Affiliation
	Transport		NCORE
	Upwind Background		
Droha inlat haight (from a	welfare Related Impacts ground) 10-15 m? Yes No		
	from probe inlet to ground (meters)		
	probe inlet from horizontal and/or ver		
Actual measured distance	from outer edge of probe inlet to supp		
Distance of outer edge of	probe inlet from other monitoring pro	be inlets > 1 m?	Yes 🗌 No 🗌 NA 🗌
Is probe $> 20$ m from the	nearest tree drip line? Yes 🔲 *N	o 🗌 (answer *'d questions)	)
	e nearest tree drip line? Yes 🗌 *N		
*Distance from probe to t	tree (m) Direction from probe	to tree *Height of tre	e (m)
Are there any obstacles to	o air flow? *Yes 🗌 (answer *'d questi	ons) No 🗌	
*Identify obstacle	Distance from probe inlet (m)	Direction from probe inlet	to obstacle
	obe to obstacle at least twice the height		
Distance of probe to near	est traffic lane (m) Direction	from probe to nearest traffi	c lane
	Manitaning Objective		
Parameters	Monitoring Objective	Scale	Monitor Type
Parameters	Monitoring Objective		
Parameters	Monitoring Objective Highest Concentration Population Exposure	Scale	Monitor Type
Parameters       NA       Air flow > 200 L/min       PM10       TSP	Monitoring Objective          Highest Concentration         Population Exposure         Source Oriented	Scale       Micro       Middle	Monitor Type
Parameters	Monitoring Objective Highest Concentration Population Exposure Source Oriented Background	Scale          Micro         Middle         Neighborhood	Monitor Type          SLAMS         SPM         Monitor Network Affiliation
Parameters       NA       Air flow > 200 L/min       PM10       TSP	Monitoring Objective          Highest Concentration         Population Exposure         Source Oriented         Background         Transport	Scale          Micro         Middle         Neighborhood         Urban	Monitor Type
Parameters          NA         Air flow > 200 L/min         PM10         TSP         TSP Pb	Monitoring Objective          Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts	Scale          Micro         Middle         Neighborhood         Urban         Regional	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE
Parameters          NA         Air flow > 200 L/min         PM10         TSP         TSP Pb	Monitoring Objective          Highest Concentration         Population Exposure         Source Oriented         Background         Transport	Scale          Micro         Middle         Neighborhood         Urban         Regional	Monitor Type          SLAMS         SPM         Monitor Network Affiliation
Parameters          NA         Air flow > 200 L/min         PM10         TSP         TSP Pb	Monitoring Objective          Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts	Scale Micro Middle Neighborhood Urban Regional 7-15 m	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE
Parameters	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m 2-7m	Scale          Micro         Middle         Middle         Neighborhood         Urban         Regional         7-15 m         /or vertical (platform or roo	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m?
Parameters          Parameters         NA         Air flow > 200 L/min         PM10         TSP         TSP Pb         Probe inlet height (from g         Actual measured distance         Distance of outer edge of         Actual measured distance	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale          Micro         Middle         Neighborhood         Urban         Regional         7-15 m         /or vertical (platform or roo eters)	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes
Parameters	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m 2-7m	Scale Micro Middle Neighborhood Urban Regional 7-15 m /or vertical (platform or roo neters) lers (X) within 2 to 4 m of e	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes         Yes         No         each other?
Parameters  NA Air flow > 200 L/min PM10 TSP TSP Pb  Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m 2-7m	Scale  Micro Middle Urban Regional 7-15 m roo vertical (platform or roo leters) lers (X) within 2 to 4 m of e both (all) collocated probe	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes         Yes         No         each other?         Yes         NA
Parameters  NA Air flow > 200 L/min PM10 TSP TSP Pb  Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance Distance (Y) between out	Monitoring Objective     Highest Concentration     Population Exposure     Source Oriented     Background     Transport     Welfare Related Impacts     welfare Related Impacts ground)	Scale  Micro Middle Urban Regional 7-15 m roo vertical (platform or roo leters) lers (X) within 2 to 4 m of e both (all) collocated probe iny other high or low volum	Monitor Type         SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes         Yes         No         each other?         Yes         No         e inlets (meters)         e inlet ≥ 2 m? Yes
Parameters  NA Air flow > 200 L/min PM10 TSP TSP Pb  Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance Distance (Y) between out Is probe > 20 m from the	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale         Micro         Middle         Neighborhood         Urban         Regional         7-15 m         /or vertical (platform or roo eters)         lers (X) within 2 to 4 m of e both (all) collocated probe my other high or low volum         o (answer *'d questions)	Monitor Type         SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes         Yes         No         each other?         Yes         No         e inlets (meters)         e inlet ≥ 2 m? Yes
Parameters  NA Air flow > 200 L/min PM10 TSP TSP Pb  Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance Distance (Y) between out	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale         Micro         Middle         Neighborhood         Urban         Regional         7-15 m         /or vertical (platform or roo eters)         lers (X) within 2 to 4 m of e both (all) collocated probe iny other high or low volum o (answer *'d questions)         o	Monitor Type         SLAMS         SPM         SPM         Monitor Network Affiliation         NCORE         > 15 m         > 15 m         f) supporting structure > 2 m? Yes         No         each other? Yes         No         e inlets (meters)         y         No         NA
Parameters  NA Air flow > 200 L/min PM10 TSP TSP Pb  Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance Distance (Y) between out Is probe > 20 m from the *Is probe > 10 m from the *Distance from probe to to	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale         Micro         Middle         Neighborhood         Urban         Regional         7-15 m         /or vertical (platform or roo eters)         lers (X) within 2 to 4 m of e both (all) collocated probe nny other high or low volum o (answer *'d questions)         o (answer *'d questions)         o *Height of tree	Monitor Type         SLAMS         SPM         SPM         Monitor Network Affiliation         NCORE         > 15 m         > 15 m         f) supporting structure > 2 m? Yes         No         each other? Yes         No         e inlets (meters)         y         No         NA
Parameters  NA Air flow > 200 L/min PM10 TSP TSP Pb  Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance Is probe > 20 m from the *Is probe > 10 m from the *Distance from probe to to Are there any obstacles to	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale         Micro         Middle         Neighborhood         Urban         Regional         7-15 m         /or vertical (platform or roo         ieters)         lers (X) within 2 to 4 m of e         both (all) collocated probe         my other high or low volum         o [ (answer *'d questions)         o [ to tree *Height of tre         ons) No [	Monitor Type         SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes         Yes         No         einlets (meters)         einlet ≥ 2 m? Yes         NO         NA
Parameters	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m 2-7m	Scale         Micro         Middle         Neighborhood         Urban         Regional         0 7-15 m         /or vertical (platform or roo         ieters)         lers (X) within 2 to 4 m of e         both (all) collocated probe         on (answer *'d questions)         o (answer *'d questions)	Monitor Type         SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? YesNo         supporting structure > 2 m? YesNo         ach other?       YesNo         e inlets (meters)          e inlet ≥ 2 m? Yes

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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	Arreighborhood	NCORE			
PM10-2.5 FRM PM10-2.5 BAM	Transport	Urban				
PM10 Lead (PB)		Regional	SUPPLEMENTAL SPECIATION			
PM2.5 Cont. (TEOM)	Welfare Related Impacts					
PM2.5 Cont. (BAM)			Monitor NAAQS Exclusion			
PM2.5 Spec. (SASS) PM2.5 Spec. (URG)			NONREGULATORY			
PM2.5 Cont. Spec.						
	ound) $\square < 2 \text{ m} $ $\square$ 2-71		n > 15 m			
	rom probe inlet to ground (meters)					
	robe inlet from horizontal (wall) a rom outer edge of probe inlet to su		rm or roof) supporting structure $> 2 \text{ m}$ ? neters) Yes $\square$ No $\square$			
	edge of probe inlets of any low v		ny other			
low volume monitor at the	site = 1 m or greater?		Yes No NA			
or TSP inlet = 2 m or greate			ume PM-10 Yes No NA			
TEOM, BAM & TEOM) L		*Yes	(answer *'d questions) No 🛛 NA 🗌			
	ellocated PM 2.5 samplers (X) with					
each other?	unler inlets within 1 m vertically o		es No Give actual (meters)			
	*Are collocated PM2.5 sampler inlets within 1 m vertically of each other? Yes No Give actual (meters) Is an URG 3000 monitor collocated with a SASS monitor at the site? *Yes (answer *'d questions) No NA					
* Entire inlet opening of co	* Entire inlet opening of collocated speciation samplers inlets (X) within 2 to 4 m of each other? Yes $\square$ No $\square$					
Give actual (meters)		ller of each others? Ve				
* Are collocated speciation sampler inlets within 1 m vertically of each other? Yes No Give actual (meters)						
site to measure PM10-2.5?			s 🗌 (answer *'d questions) No 🛛 NA			
	llocated PM10 and PM2.5sampler	rs for PM10-2.5 (X) v	within Yes No No			
2 to 4 m of each other? *Are collocated PM10 and	PM2.5 sampler inlets within 1 m	vertically of each oth	er? Yes No			
	earest tree drip line? Yes 🛛					
*Is probe > 10 m from the r	nearest tree drip line? Yes 🔲 '	*No 🗌				
*Distance from probe to tre	e (m) Direction from pro	be to tree *Heig	ght of tree (m)			
	air flow? *Yes 🔲 (answer *'d que	· -				
	istance from probe inlet (m)					
	*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes $\square$ No $\square$ Distance of probe to nearest traffic lane (m) <u>92</u> Direction from probe to nearest traffic lane <u>SSE</u>					
RECOMMENDATIONS:		· · · · · · · · · · · · · · · · · · ·				
<ol> <li>Maintain current site stat</li> </ol>	tus? Yes 🛛 *No 🗌 (answer '	*'d questions)				
<i>.</i>	ective? Yes 🗌 (enter new object		]-			
*3) Change scale of represe	entativeness? Yes 🗌 (enter new					
*4) Relocate site? Yes	No 🛛					
Comments:						
Date of Last Site Pictures	11/17/14 New Pictures Sub	mitted? Yes 🔲 No				
Reviewer Jimmy Reske			Date December 7, 2015			
Ambient Monitoring Coordi	inator <u>RAT</u>		DateDecember 7, 2015			

Region <u>RRO</u> Site Name <u>Blackstone</u>			AQS Site # 37- <u>105</u> - <u>0002</u>				
Street Address-4110 BLACKSTONE RD			City SANFORD				
Urban Area Not in an Urban Area Core-based Statistical Area Sanford, NC			3				
	Enter E	xact					
Longitude <u>-79</u>	.28879	Latitude	35.4324	8	N	lethod of M	leasuring
In Decimal Degrees		In Decimal	Degrees		<b>Interpolation</b>	Explanati	on: <u>Orthophoto</u>
Elevation Above/belo	ow Mean Sea	a Level (in r	neters)			<u>117</u>	
Name of nearest road to inlet probe Blackstone Road ADT 355 Year latest available 2012							
Comments:							
Distance of site to near	est major road	(m) <u>50.00</u> I	Direction from	site to	nearest major ro	ad <u>E</u>	
Name of nearest major road Blackstone Road ADT 355 Year 2012							
Comments:							
Site located near electrical substation/high voltage power lines? Yes 🗌 No 🛛							
Distance of site to nearest railroad track       (m) Direction to RR NA         Distance of site to nearest power pole w/transformer       (m) 35 Direction SE							
Distance between site and drip line of water tower (m) Direction from site to water tower $NA$							
Explain any sources of construction activities	-				100	ge, stacks, ver	nts, railroad tracks,

### Site Information

Parameters	Monitoring Objective	Scale	Monitor Type		
□ NA	General/Background <u>SO2 NO2</u> O3 Highest Concentration	Micro Middle	□SLAMS ⊠SPM <u>SO2 NO2 O3</u>		
HSNOy	Max O3 Concentration		Monitor Network Affiliation		
<ul> <li>☑ O<sub>3</sub></li> <li>☑ NH<sub>3</sub></li> <li>☑ Hydrocarbon</li> <li>☑ Air Toxics</li> <li>☑ HSCO (Not Micro)</li> <li>☑ CO (trace-level)</li> </ul>	Population Exposure Source Oriented Transport Upwind Background Welfare Related Impacts	Neighborhood Urban <u>SO2 NO2</u> O3 Regional	NCORE Unofficial PAMS		
Probe inlet height (from ground) 2-15 m? Yes $\boxtimes$ No $\square$ Give actual measured height from ground (meters) <u>3.68</u>					
Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes $\boxtimes$ No $\square$ Actual measured distance from outer edge of probe to supporting structure (meters)					
Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? $Yes \boxtimes No \square NA \square$					
Is probe $\geq 20$ m from the nearest tree drip line? Yes $\boxtimes$ *No $\square$ (answer *'d questions)					
*Is probe > 10 m from the r	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					
· · · · · · · · · · · · · · · · · · ·	e to obstacle at least twice the height th				
Distance of probe to neares	t traffic lane (m) 50 Direction from p	probe to nearest traffic lan	e <u>E</u>		

Parameters	Monitoring Objective	Scale	Monitor Type
NA	General/Background		
NO <sub>y</sub> (trace-level)	Highest Concentration	Micro	SLAMS
	Max O3 Concentration	Middle	SPM
	Population Exposure	Neighborhood	
	Source Oriented	Urban	Monitor Network Affiliation
	Transport	Regional	
	Upwind Background		NCORE
	Welfare Related Impacts		
Probe inlet height (from a	ground) 10-15 m? Yes 🗌 No 🗌		
	from probe inlet to ground (meters) _		
 Distance of outer edge of	probe inlet from horizontal and/or ver	tical supporting structure >	1 m <sup>2</sup> Var 🗖 No 🗖
	from outer edge of probe inlet to supp		
		<b></b>	
Distance of outer edge of $L_{a}$ methods $20 \text{ m}$ from the	probe inlet from other monitoring pro nearest tree drip line? Yes *N	be inlets $> 1 \text{ m}?$	Yes No NA
*Is probe $> 10$ m from the	e nearest tree drip line? Yes 🔲 *N	[0 ] (answer * a questions)	)
*Distance from probe to t	ree (m) Direction from probe	to tree *Height of tre	e (m)
	air flow? *Yes 🗌 (answer *'d questi		
*Identify obstacle	Distance from probe inlet (m)	Direction from probe inlet	to obstacle
	obe to obstacle at least twice the heigh		
Distance of probe to near	est traffic lane (m) Direction	from probe to nearest traffi	c lane
Distance of probe to near Parameters	Monitoring Objective	Scale	Monitor Type
	Monitoring Objective	Scale	Monitor Type
Parameters           NA           Air flow > 200 L/min	Monitoring Objective Highest Concentration	Scale	Monitor Type
Parameters NA Air flow > 200 L/min □ PM10	Monitoring Objective Highest Concentration Population Exposure	Scale	Monitor Type
Parameters NA Air flow > 200 L/min □ PM10 □ TSP	Monitoring Objective Highest Concentration Population Exposure Source Oriented	Scale	Monitor Type
Parameters NA Air flow > 200 L/min □ PM10	Monitoring Objective Highest Concentration Population Exposure Source Oriented Background	Scale          Micro         Middle         Neighborhood	Monitor Type SLAMS SPM Monitor Network Affiliation
Parameters NA Air flow > 200 L/min □ PM10 □ TSP	Monitoring Objective          Highest Concentration         Population Exposure         Source Oriented         Background         Transport	Scale Scale Micro Middle Neighborhood Urban	Monitor Type SLAMS SPM
Parameters NA Air flow > 200 L/min □ PM10 □ TSP □ TSP Pb	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts	Scale          Micro         Middle         Neighborhood         Urban         Regional	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE
Parameters NA Air flow > 200 L/min ☐ PM10 ☐ TSP ☐ TSP Pb Probe inlet height (from g	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale          Micro         Middle         Middle         Weighborhood         Urban         Regional         7-15 m	Monitor Type SLAMS SPM Monitor Network Affiliation
Parameters NA Air flow > 200 L/min ☐ PM10 ☐ TSP ☐ TSP Pb Probe inlet height (from g	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts	Scale          Micro         Middle         Middle         Weighborhood         Urban         Regional         7-15 m	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE
Parameters          Parameters         NA         Air flow > 200 L/min         PM10         TSP         TSP Pb         Probe inlet height (from g Actual measured distance	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale Scale Micro Middle Neighborhood Urban Regional 7-15 m	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m
Parameters          Parameters         NA         Air flow > 200 L/min         PM10         TSP         TSP Pb         Probe inlet height (from g         Actual measured distance	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale Scale Micro Middle Neighborhood Urban Regional 7-15 m	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m
Parameters NA Air flow > 200 L/min □ PM10 □ TSP □ TSP Pb Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         from probe inlet to ground (meters)         probe inlet from horizontal (wall) and         from probe to supporting structure (meters)	Scale Micro Middle Neighborhood Urban Regional 7-15 m for vertical (platform or roo neters)	Monitor Type          SLAMS
Parameters NA Air flow > 200 L/min □ PM10 □ TSP □ TSP Pb Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale          Micro         Middle         Middle         Urban         Urban         Regional         7-15 m         /or vertical (platform or roo reters)         lers (X) within 2 to 4 m of or set of the set of th	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m?         Yes         No
Parameters	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         from probe inlet to ground (meters)         probe inlet from horizontal (wall) and         from probe to supporting structure (meters)         Ilocated PM-10, TSP or TSP Pb Samp         (X) including entire inlet openings of	Scale  Micro Middle Neighborhood Urban Regional 7-15 m for vertical (platform or roo neters) lers (X) within 2 to 4 m of of both (all) collocated probe	Monitor Type          SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m?         Yes       No         each other? Yes       No         inlets (meters)
Parameters NA Air flow > 200 L/min □ PM10 □ TSP □ TSP Pb Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance Distance (Y) between out	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale  Micro Middle Neighborhood Urban Regional 7-15 m for vertical (platform or roo neters) lers (X) within 2 to 4 m of of both (all) collocated probe	Monitor Type         SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes         Yes         No         einlets (meters)         e inlet ≥ 2 m? Yes
Parameters NA Air flow > 200 L/min □ PM10 □ TSP □ TSP Pb Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance Distance (Y) between out Is probe > 20 m from the	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale  Micro Middle Middle Urban Regional regional regional Vor vertical (platform or roo neters) Nor vertical (platform or roo neters) ders (X) within 2 to 4 m of c both (all) collocated probe uny other high or low volum fo (answer *'d questions)	Monitor Type         SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes         Yes         No         einlets (meters)         e inlet ≥ 2 m? Yes
Parameters NA Air flow > 200 L/min □ PM10 □ TSP □ TSP Pb Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance Distance (Y) between out Is probe > 20 m from the *Is probe > 10 m from the	Monitoring Objective   Highest Concentration   Population Exposure   Source Oriented   Background   Transport   Welfare Related Impacts   welfare Related Impacts   pround)   < 2 m	Scale  Micro Middle Middle Urban Regional T-15 m For vertical (platform or roo neters) Nor vertical (platform or roo neters) ders (X) within 2 to 4 m of c both (all) collocated probe uny other high or low volum fo (answer *'d questions	Monitor Type         SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes         Yes       No         watch other? Yes       No         No       NA         inlets (meters)
Parameters	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale         Micro         Middle         Weighborhood         Urban         Regional         7-15 m         /or vertical (platform or roometers)         lers (X) within 2 to 4 m of competers)         lers (X) within 2 to 4 m of competers)         (answer **'d questions)         (answer **'d questions)         (b to tree *Height of tree)	Monitor Type         SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes         Yes       No         watch other? Yes       No         No       NA         inlets (meters)
Parameters	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale Micro Middle Middle Urban Urban Regional 7-15 m for vertical (platform or roo neters) Vor vertical (platform or roo neters) Urban (answer **'d questions for*Height of tree ions) No	Monitor Type         SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m?         Yes       No         reach other? Yes       No         nlets (meters)
Parameters NA Air flow > 200 L/min □ PM10 □ TSP □ TSP Pb Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance Distance (Y) between out Is probe > 20 m from the *Is probe > 10 m from the *Distance from probe to to Are there any obstacles to *Identify obstacle 	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale         Micro         Middle         Neighborhood         Urban         Regional         To rectical (platform or roometers)         Image: State of the state	Monitor Type         SLAMS         SPM         Monitor Network Affiliation         NCORE         > 15 m         f) supporting structure > 2 m? Yes         Yes         No         einlets (meters)         e inlet ≥ 2 m? Yes         No         o obstacle
Parameters NA Air flow > 200 L/min □ PM10 □ TSP □ TSP Pb Probe inlet height (from g Actual measured distance Distance of outer edge of Actual measured distance Entire inlet opening of co Actual measured distance Distance (Y) between out Is probe > 20 m from the *Is probe > 10 m from the *Distance from probe to 10 Are there any obstacles to *Identify obstacle 	Monitoring Objective         Highest Concentration         Population Exposure         Source Oriented         Background         Transport         Welfare Related Impacts         ground)       < 2 m	Scale         Micro         Middle         Neighborhood         Urban         Regional         To rectical (platform or roometers)         Image: State of the state	Monitor Type         SLAMS         SPM

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Parameters	Monitoring Objective	Scale	Site Type		
🗖 NA					
Air flow < 200 L/min	General/Background	Micro	SLAMS		
PM2.5 FRM	Highest Concentration	Middle	SPM		
PM10 FRM PM10 Cont. (BAM)	Population Exposure	Neighborhood	Monitor Network Affiliation		
PM10-2.5 FRM	Source Oriented		NCORE		
PM10-2.5 BAM	Transport	Urban	SUPPLEMENTAL SPECIATION		
PM10 Lead (PB)	Welfare Related Impacts	Regional	_ SOTTEENENTAE STEERATION		
PM2.5 Cont. (TEOM)		-			
PM2.5 Cont. (BAM) PM2.5 Spec. (SASS)			Monitor NAAQS Exclusion		
PM2.5 Spec. (URG)			NONREGULATORY		
PM2.5 Cont. Spec.					
	und) 🗌 < 2 m 🛛 2-7m		> 15 m		
Actual measured distance fr	om probe inlet to ground (meters)	<u>2.5</u>			
			m or roof) supporting structure > 2 m?		
	om outer edge of probe inlet to su				
Distance (Y) between outer volume monitor at the site =	edge of probe inlets of any low vo	olume monitor and an	y other low Yes 🛛 No 🗌 NA 🗌		
Distance (Y) between outer	edge of all low volume monitor in	lets and any Hi-Volu	me PM-10		
or TSP inlet = 2 m or greate		acts and any me void	Yes No NA		
	tors (Two FRMs, FRM & BAM, I	FRM & *Var	(answer *'d questions) No 🛛 NA 🗌		
TEOM, BAM & TEOM) Lo					
	located PM 2.5 samplers (X) with				
each other?	pler inlets within 1 m vertically of		s No Give actual (meters)		
Is an URG 3000 monitor collocated with a SASS monitor at the site? *Yes (answer *'d questions) No 🛛 NA 🗌 *Entire inlet opening of collocated speciation samplers inlets (X) within 2 to 4 m of each other? Yes 🗋 No 🗍					
Give actual (meters)					
* Are collocated speciation sampler inlets within 1 m vertically of each other? Yes 🗌 No 🔲 Give actual (meters)					
Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the arise to measure PM10 2.52 (answer *'d questions) No 🛛 NA					
She to measure PM10-2.3?					
* Entire inlet opening of collocated PM10 and PM2.5samplers for PM10-2.5 (X) within 2 to 4 m of each other? Yes No					
	PM2.5 sampler inlets within 1 m v	ertically of each othe	r? Yes No		
Is probe > 20 m from the ne	arest tree drip line? Yes 🛛 *	No 🗌 (answer *'d q	uestions)		
*Is probe > 10 m from the nearest tree drip line? Yes $\square$ *No $\square$					
*Distance from probe to tree	e (m) Direction from prob	e to tree *Heig	ht of tree (m)		
Are there any obstacles to an	r flow? *Yes 🗌 (answer *'d ques	stions) No 🗖			
	stance from probe inlet (m)				
*Is distance from inlet probe	e to obstacle at least twice the heig	that the obstacle p	rotrudes above the probe? Yes 🗌 No 🗌		
	traffic lane (m) 50 Direction fr	rom probe to nearest	traffic lane <u>E</u>		
RECOMMENDATIONS:					
1) Maintain current site stat	us? Yes 🛛 *No 🗌 (answer '	*'d questions)			
*2) Change monitoring obj	ective? Yes 🗌 (enter new objec	ctive No 🛛	]-		
*3) Change scale of represe	entativeness? Yes 🗌 (enter new	v scale _) No	$\boxtimes$		
*4) Relocate site? Yes	No 🛛				
Comments:					
Date of Last Site Pictures	10/28/2014 New Pictures St	ubmitted? Yes 🔲 🛽 🗎	No 🔀		
Reviewer Steve Helms			Date November 9, 2015		
	notor Dile Tahaon				
Ambient Monitoring Coordi	mator <u>Kik Tebeau</u>		DateDecember 2, 2015		

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### **Appendix D-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) Microscale 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 welfarebased 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 D3. Site Type Appropriate Siting Scales