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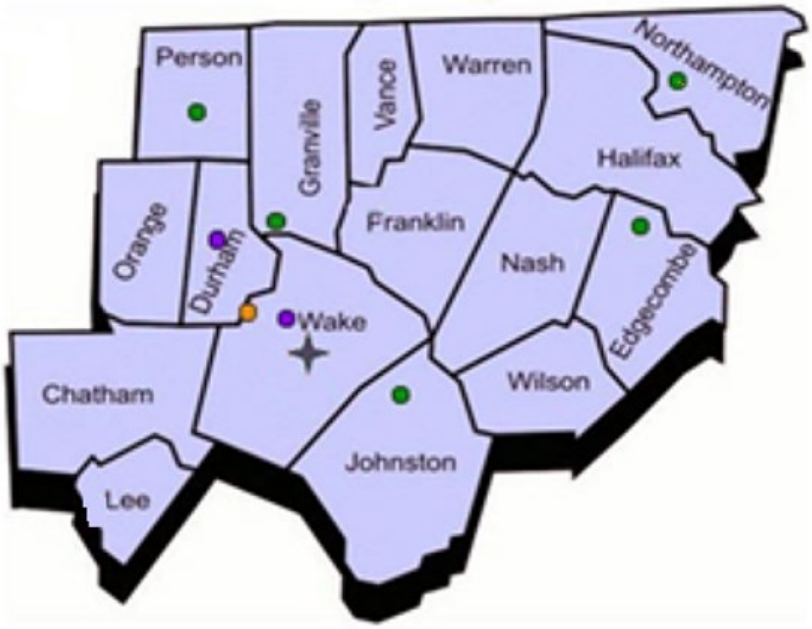
NORTH CAROLINA
Environmental Quality

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

Volume 2

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

D. The Raleigh Monitoring Region



July 1, 2021

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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, or MSA, consists of Chatham, Durham, Granville, Orange and Person counties. (2) The northeastern Piedmont consists of Halifax, Northampton, Vance and Warren counties. (3) The Raleigh MSA consists of Franklin, Johnston and Wake counties. (4) The Rocky Mount MSA consists of Edgecombe and Nash counties. (5) The Wilson micropolitan statistical area (MiSA) consists of Wilson County and (6) the Sanford MiSA consists of Lee County.

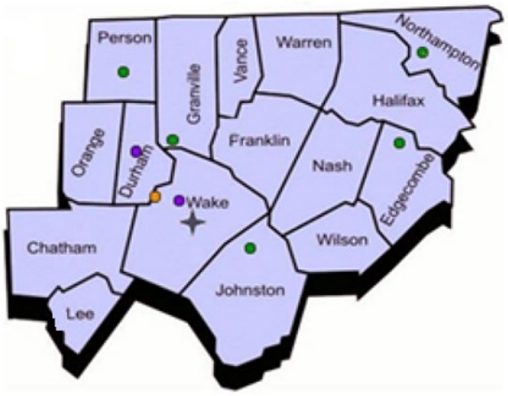

Figure D1. The Raleigh monitoring region
The dots show the approximate locations of most of the monitoring sites in this region.

(1) Durham-Chapel Hill MSA

The Durham-Chapel Hill MSA consists of five counties: Chatham, Durham, Granville, Orange and Person. The major metropolitan areas are the cities of Durham and Chapel Hill. The North Carolina Division of Air Quality, or DAQ, currently operates three monitoring sites in the Durham-Chapel Hill MSA. These sites are located at the Durham Armory in the City of Durham in Durham County, Butner in Butner in Granville County and Bushy Fork in Person County. Starting on Jan. 1, 2017, DAQ in cooperation with Duke Energy Progress started operating a fourth site in Semora (Person County). Figure D2 maps the locations of these monitors. DAQ shut down the seasonal ozone monitor in Pittsboro in Chatham County on Oct. 31, 2015, at the end of ozone season and shut down the rotating sulfur dioxide monitor on Feb. 4, 2015.

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

At the Durham Armory site, DAQ operates a seasonal ozone monitor, a population weighted emission index, or PWEI, sulfur dioxide monitor, a continuous low volume PM_{10} monitor and a continuous fine particle monitor. Figure D3 through Figure D11 presents pictures of the site, as well as views looking north, northeast, east, southeast, south, southwest, west and northwest. This fine-particle monitoring site is the design value site for the MSA. On Jan. 1, 2011, 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, the division changed this monitor to a continuous low volume PM_{10} monitor. On Aug. 14, 2019, DAQ added a collocated one-in-six-day fine particle FRM monitor. The division shut down the one-in-three-day and one-in-six-day fine particle FRM monitors on Sep. 30, 2020, and made the continuous fine particle monitor at the site the primary 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 northeast

Figure D6. Durham Armory site looking northwest

Figure D7. Looking west from the Durham Armory site

Figure D8. Durham Armory site looking southwest

At the **Butner** site, 37-077-0001, DAQ operates a seasonal ozone monitor. Figure D35 through Figure D39 provide views of the site as well as looking north, northeast, east, southeast, south, southwest, west and northwest. The division established the Butner site 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. In 2022, DAQ will replace the shelter and may relocate the site.

Figure D9. Looking east from the Durham Armory site

Figure D10. Durham Armory site looking southeast

Figure D11 Durham Armory site looking south

Figure D12. The Butner ozone-monitoring site

Figure D13. Looking north from the Butner site

Figure D14. Looking northwest from the Butner site

Figure D15. Looking west from the Butner site

Figure D16. Looking northeast from the Butner site

Figure D17. Looking east from the Butner site

Figure D18. Looking southeast from the Butner site

Figure D19. Looking southwest from the Butner site

Figure D20. Looking south from the Butner site

At the Bushy Fork site, 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 to support modeling requirements for the sulfur dioxide national ambient air quality standard, or NAAQS. Figure D21 through Figure D25 show a picture of the site as well as views looking north, east, south and west.

Figure D21. Bushy Fork ozone monitoring site

Figure D22. Bushy Fork site looking north

Figure D24. Bushy Fork site looking east

Figure D23. Bushy Fork site looking west

Figure D25. Bushy Fork site looking south

At the beginning of the 2018 ozone season, DAQ noted that construction on an access road had begun. As the season progressed, the property owner placed a paved road within about 6 meters of the site shelter. Ultimately, the property owner paved the road with asphalt. The road provides access to a cell tower recently placed at the park. Sometime in the future, the division may shut down this monitoring site because it is no longer required by 40 CFR Part 58, Appendix D.

In 2008, the United States Environmental Protection Agency, or EPA, expanded the **lead** monitoring network to support the lower lead NAAQS of 0.15 micrograms per cubic meter.[1] On Dec. 27, 2010, the EPA revised the monitoring requirements to focus on fenceline monitoring located at facilities that emit 0.5 tons or more of lead per year and at National Core, NCore, monitoring sites.[2] On March 28, 2016, the EPA finalized changes to ambient monitoring quality assurance and other requirements, which removed the requirement for lead monitoring at NCore monitoring stations in urban areas with populations greater than 500,000.[3] These changes to the lead monitoring network requirements did not require any lead monitoring in the Durham-Chapel Hill MSA. The Duke Energy Progress Roxboro electricity generating facility emitted 77.3 pounds of lead in 2019 and CPI USA North Carolina, LLC, emitted 118.02 pounds,[4] both well below the 0.5-ton threshold. In addition, modeling performed in 2009 indicated the concentrations of lead in ambient air around the Duke Progress Energy Roxboro electricity generating 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. CPI USA North Carolina, LLC, ceased operations on March 31, 2021.

Currently, the MSA is required to operate two **ozone** monitors – one at the Durham Armory, 37-063-0015, and one at Butner, 37-077-0001. Beginning in 2017, seasonal ozone monitoring started on March 1 instead of April 1. Sometime in the future, the division will evaluate the Bushy Fork, 37-145-0003, ozone site to determine if it is still needed. The 2010 **nitrogen dioxide** monitoring requirements,[5] as modified in 2016,[6] do not require the Durham-Chapel Hill MSA to monitor for nitrogen dioxide.

The 2010 **sulfur dioxide monitoring** requirements added additional monitoring in this MSA. Because of power generating facilities in Person and Chatham counties and a large population base, DAQ added a PWEI population exposure monitor at the Armory site on Jan. 1, 2013. Figure D31 shows the location of the PWEI monitor relative to where people lived based on the 2010 census. Figure D32 shows the

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[1] National Ambient Air Quality Standards for Lead, Federal Register, Vol. 73, No. 219, \ Wednesday, Nov. 12, 2008, p. 66964, available on the worldwide web at https://www.gpo.gov/fdsys/pkg/FR-2008-11-12/pdf/E8-25654.pdf.

[2] Revisions to Lead Ambient Air Monitoring Requirements, Federal Register, Vol. 75, No. 247, Monday, Dec. 27, 2010, p. 81126, available on the worldwide web at https://www.gpo.gov/fdsys/pkg/FR-2010-12-27/pdf/2010-32153.pdf#page=1.

[3] Revisions to Ambient Monitoring Quality Assurance and Other Requirements, Federal Register, Vol. 81, No. 59, Monday, March 28, 2016, p. 17248, available on the worldwide web at https://www.gpo.gov/fdsys/pkg/FR-2016-03-28/pdf/2016-06226.pdf.

[4] United States Environmental Protection Agency. (2021). *TRI Explorer* (2019 Updated Dataset (released March 2021)) [Internet database]. Retrieved from https://enviro.epa.gov/triexplorer/tri_release.facility, (May 1, 2021).

[5] Primary National Ambient Air Quality Standards for Nitrogen Dioxide, Federal Register**,** Vol. 75, No. 26, Feb. 9, 2010, available on the worldwide web at https://www3.epa.gov/ttn/naaqs/standards/nox/fr/20100209.pdf.

[6] Revision to the Near-road NO2 Minimum Monitoring Requirements, Federal Register**,** Vol. 81, No. 251, Dec. 30, 2016, available on the worldwide web at https://www.gpo.gov/fdsys/pkg/FR-2016-12-30/pdf/2016-31645.pdf.

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 D33. Carolina Sunrock reported emitting 2.7 tons of sulfur dioxide in 2016.[7] As part of the Data Requirements Rule, Duke and DAQ added a source-oriented sulfur dioxide monitor in this MSA at Semora in Person County on Jan. 1, 2017. This monitor operated until Dec. 31, 2020.

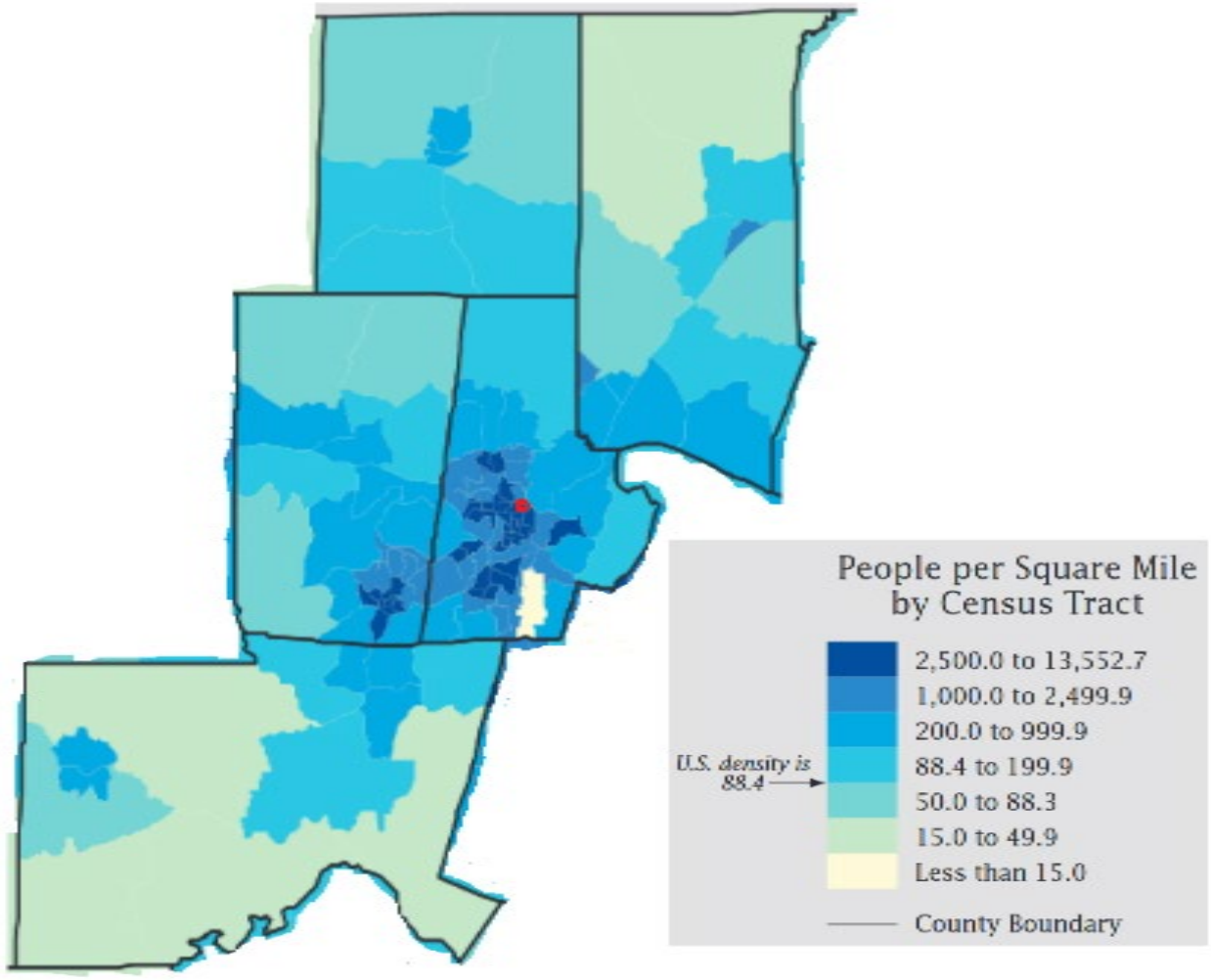


Figure D26. Location of Durham-Chapel Hill PWEI monitor in relationship to centers of population in 2010

[7] North Carolina Criteria and Toxic Air Pollutant Point Source Emissions Report, available on the worldwide web at https://xapps.ncdenr.org/aq/ToxicsReport/ToxicsReportFacility.jsp?ibeam=true&county_code=063&year=2016&sorting=3&overridetype=All&pollutant=264, accessed April 20, 2018.

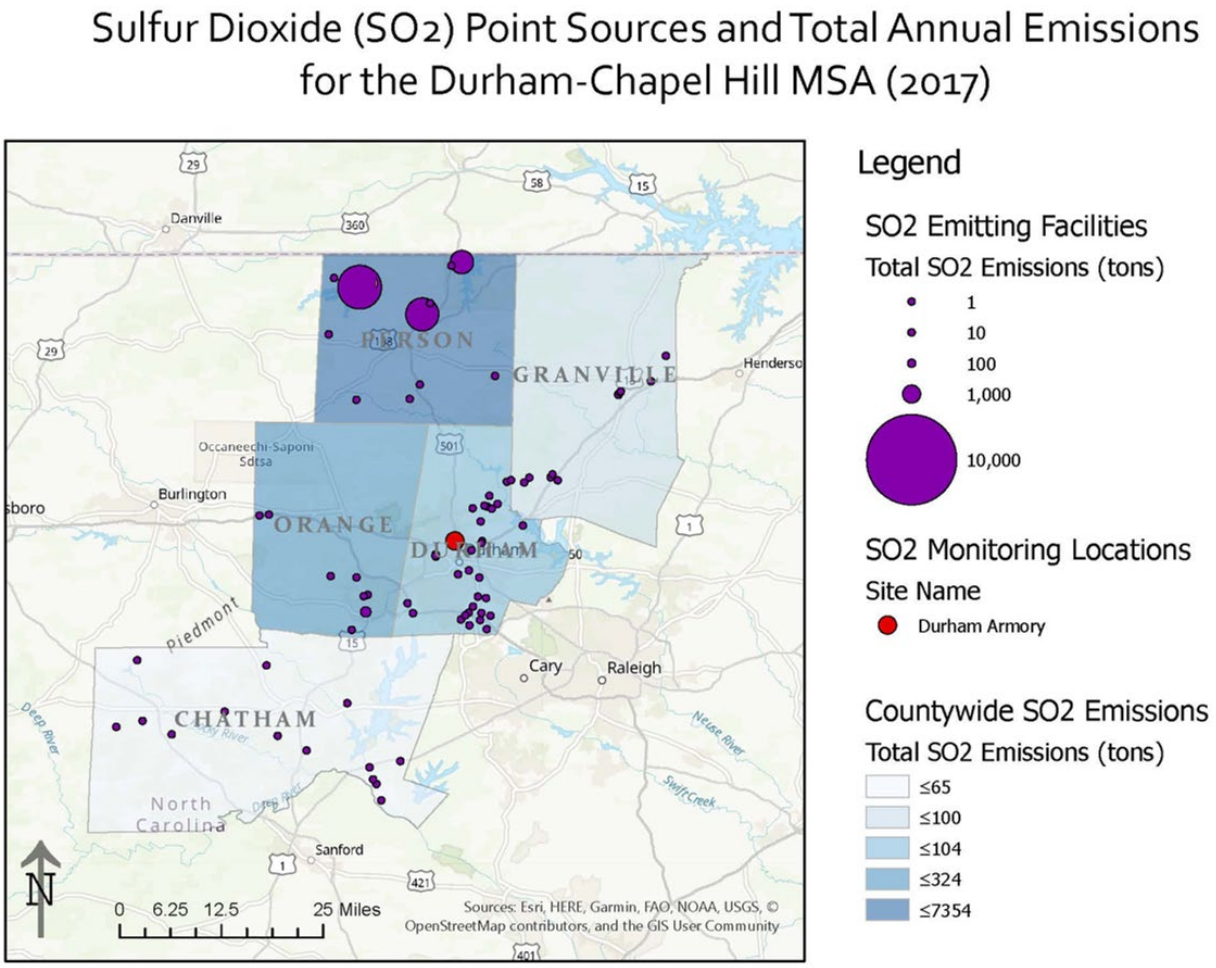


Figure D27. Location of the Durham-Chapel Hill PWEI sulfur dioxide monitor, red dot, in relationship to sulfur dioxide sources

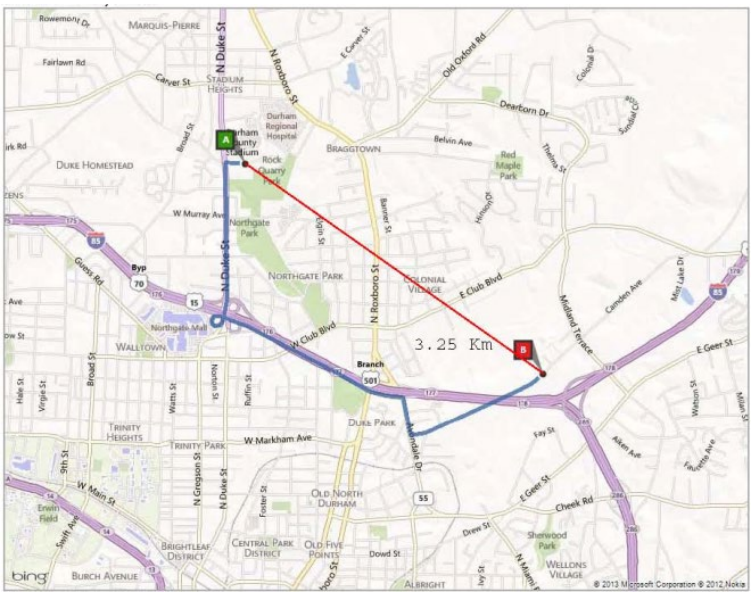


Figure D28. Location of the Armory monitoring site, A, in relationship to Carolina Sunrock, B

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 four counties: Halifax, Northampton, Vance and Warren. There is not an MSA in these counties; however, Henderson MiSA is in Vance County and the Roanoke Rapids MiSA consists of Halifax and Northampton counties. DAQ currently operates one monitoring site in the northeastern Piedmont. This site is located in Northampton County. Figure D34 provides the location of this monitoring site.

Figure D29. Location of the Northampton County monitoring site
The purple circle is the Northampton County nitrogen dioxide and fine particle monitoring site.

At the **Northampton County** site, 37-131-0001, DAQ operates special purpose fine particle and nitrogen dioxide monitors. Figure D35 through Figure D39 provide pictures of the site as well as the views looking north, northeast, east, southeast, south, southwest, west and northwest. DAQ established the Northampton County site as a background site for the Roanoke Rapids MiSA.

Figure D30. The Northampton fine particle and nitrogen dioxide-monitoring site

Figure D31. Looking north from the Northampton site

Figure D33. Looking east from the Northampton site

Figure D32. Looking west from the Northampton site

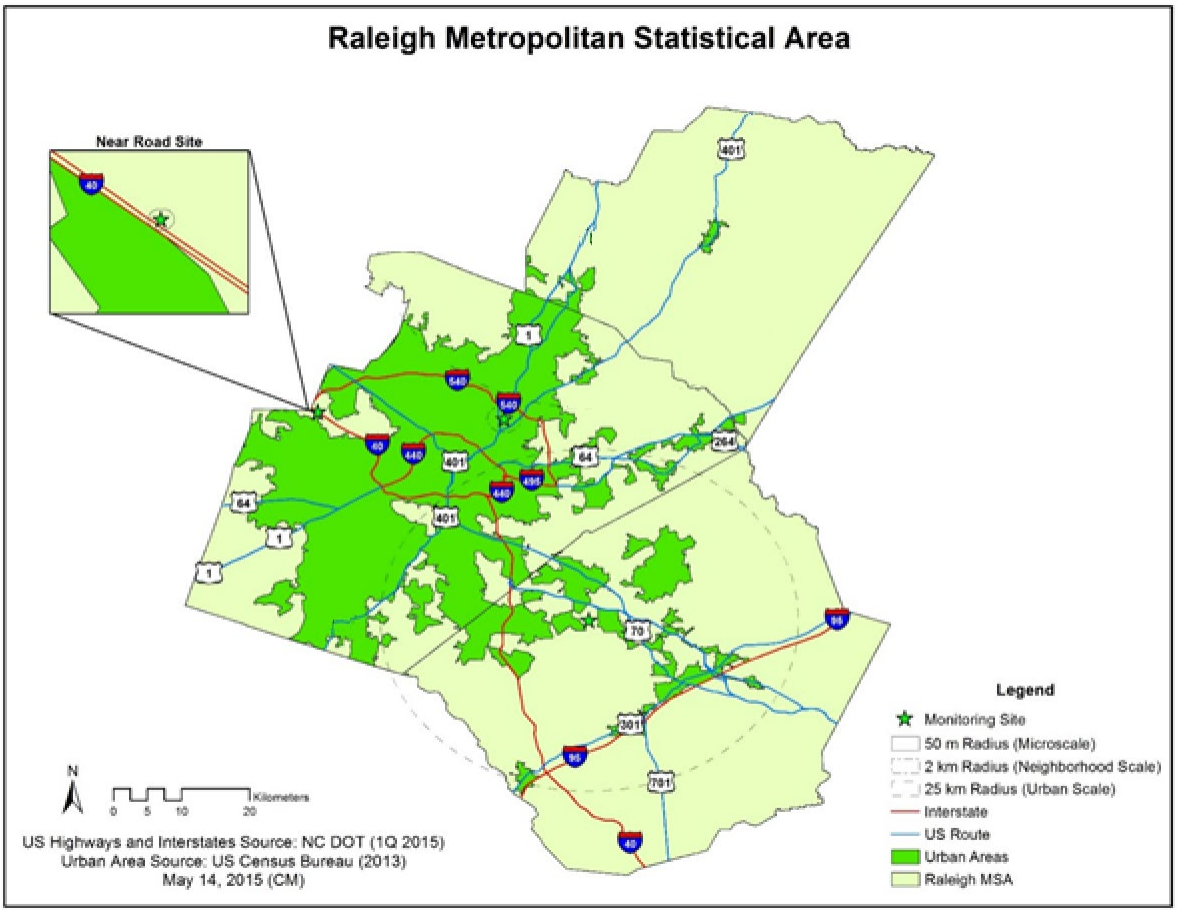
Figure D34. Looking south from the Northampton site

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

The 2015 **ozone monitoring** requirements did not require additional monitoring in the northeastern Piedmont. The area does not have any MSAs that 40 Code of Federal Regulations, or CFR, Part 58, Appendix D requires to conduct population exposure monitoring in urban areas. The northeastern Piedmont did not add monitors to comply with 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 also did not add sulfur dioxide monitors to comply with the 2010 **sulfur dioxide monitoring** requirements because there are no large sources of sulfur dioxide in this area. This area also does not need to do carbon monoxide monitoring to comply with the changes to the **carbon monoxide monitoring** requirements because the population is under one million.

(3) The Raleigh MSA

As shown in Figure D40, the Raleigh MSA consists of three counties: Franklin, Johnston and Wake. The major metropolitan areas include Raleigh and Cary. DAQ currently operates three monitoring sites in the Raleigh MSA. These sites are located at West Johnston in Johnston County and Millbrook and Triple Oak in Wake County. The division shut down the ozone monitors at Franklinton and Fuquay on Oct. 31, 2015.



Millbrook multipollutant site, center, neighborhood scale; Triple Oak near-road site, furthest west, micro scale; and West Johnston ozone and particle monitors, furthest east, urban scale.

Figure D35. Monitoring sites located in the Raleigh MSA.

At the **West Johnston** site, 37-101-0002, DAQ operates a seasonal ozone monitor and a continuous fine particle monitor. The division established the West Johnston ozone site 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. Title 40 CFR Part 58, Appendix D requires the Raleigh MSA to have two ozone monitoring sites. The West Johnston fine particle site is the third fine-particle monitoring site in the MSA. The Raleigh MSA has a population over one million people and is currently required, based on its design value, to have two fine particle monitors. DAQ added a continuous fine particle monitor at the site in 2016 that replaced the FRM monitor at the end of 2017. Figure D41 through Figure D45 provide a picture of the site and views looking north, east, south and west.

Figure D36. The West Johnston ozone and fine-particle monitoring site

Figure D37. Looking north from the West Johnston site

Figure D39. Looking east from the West Johnston site

Figure D38. Looking west from the West Johnston site

Figure D40. Looking south from the West Johnston site

At the **Millbrook** site, 37-183-0014, 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, continuous PM_{10} and $PM_{10-2.5}$, nitrogen dioxide and trace-level sulfur dioxide, carbon monoxide and reactive oxide of nitrogen monitors. The manual one-in-three-day PM_{10} and $PM_{10-2.5}$ monitors, as well as the collocated one-in-six-day PM_{10} monitor, ended in 2017 after DAQ installed a continuous PM_{10} and $PM_{10-2.5}$ monitor at the site. DAQ also started evaluating a Teledyne T640X $PM_{10-2.5}$ monitor at Millbrook in April 2017 and made this monitor the primary fine particle, PM_{10} and $PM_{10-2.5}$ monitor on Oct. 1, 2020. The division plans to shut down the BAM fine particle, PM_{10} and $PM_{10-2.5}$ monitors in 2021. DAQ also operates a meteorological station at this site. The division shut down the continuous fine particle monitors for sulfate, nitrate and black carbon on March 31, 2020, to make space for the PAMS monitors. PAMS monitoring for hourly speciated VOCs, 8-hour carbonyls, and hourly mixing layer height, barometric pressure and ultraviolet radiation will begin on June 1, 2021. Also, on May 17, 2021, the division will replace the photolytic NO_2 monitor with a CAPS NO_2 monitor. Figure D46 through Figure D54 provide a picture of the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest. The Millbrook site is an NCore, National Community Representative, site so DAQ installed the probe for the reactive oxide of nitrogen monitor at this site on a 10-meter tower in late 2010. On Dec. 27, 2011, 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 division added a carbonyl sampler to the site to support a shale-gas development background-monitoring study in Lee County. DAQ has monitored for VOCs at Millbrook since July 14, 2004, on a one-in-six-day schedule. On April 24, 2018, the division added a background rainwater-collection sampler to the site.

Figure D41. Millbrook NCore monitoring site

Figure D42. Looking north from the Millbrook site

Figure D46. Looking northeast from the Millbrook site

Figure D43. Looking northwest from the Millbrook site

Figure D47. Looking east from the Millbrook site

Figure D44. Looking west from the Millbrook site

Figure D48. Looking southeast from the Millbrook site

Figure D45. Looking southwest from the Millbrook site

Figure D49. Looking south from the Millbrook site

At the **Triple Oak** site, 37-183-0021, DAQ operates a near road nitrogen dioxide monitor with a photolytic convertor, trace-level carbon monoxide and continuous fine particle monitors. The nitrogen dioxide monitor started operating on Jan. 8, 2014. The carbon monoxide monitor started operating on Dec. 6, 2016, and the fine particle monitor started operating in 2017. Figure D55 through Figure D63 provide a picture of the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest.

Figure D50. The Triple Oak near road nitrogen dioxide monitoring site, 37-183-0021

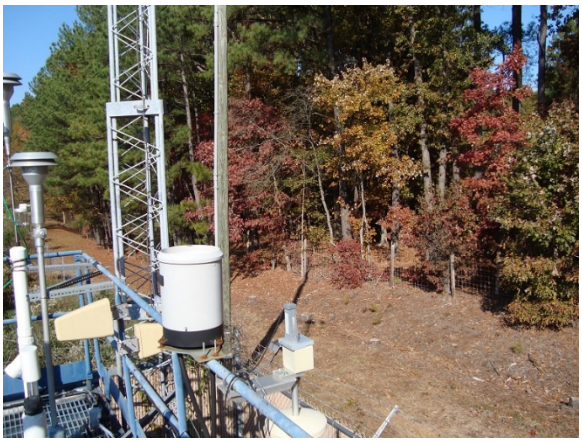


Figure D51. Looking north from the Triple Oak site

Figure D52. Looking northeast from the Triple Oak site

Figure D53. Looking northwest from the Triple Oak site

Figure D56. Looking east from the Triple Oak site

Figure D54. Looking west from the Triple Oak site

Figure D57. Looking southeast from the Triple Oak site

Figure D55. Looking southwest from the Triple Oak site

Figure D58. Looking south from the Triple Oak site

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

This MSA was also required to add a carbon monoxide monitor to comply with the changes to the **carbon monoxide monitoring** requirements. Starting Jan. 1, 2017, the regulation requires near-road, carbon dioxide monitoring in MSAs with populations greater than one million. On Jan. 1, 2017, DAQ was also required to add a fine particle monitor at the Triple Oak near-road monitoring site.

Changes to the **ozone monitoring** requirements in 2015 did not require additional ozone monitoring in the Raleigh MSA. The MSA currently meets the minimum number of monitors required by 40 CFR Part 58, Appendix D for population exposure monitoring in urban areas. Seasonal ozone monitoring starts on March 1 instead of April 1 starting in 2017. The 2015 ozone monitoring regulations did require the division to begin PAMS monitoring at the Millbrook NCore site starting on June 1, 2021.

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. To comply with the December 2010 changes to the **lead monitoring** requirements,[8] DAQ began lead monitoring at the Raleigh Millbrook NCore 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.[9] The Raleigh MSA does not have any permitted facilities located within its bounds that emit 0.5 ton or more of lead per year so no other lead monitoring is required.

(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. DAQ currently operates one monitoring site in the Rocky Mount MSA, located in Edgecombe County at Leggett as shown in Figure D64.

[8] Revisions to the Lead Ambient Air Monitoring Requirements, Federal Register, Vol. 75, No. 247, Monday, Dec. 27, 2010, available on the worldwide web at https://www.gpo.gov/fdsys/pkg/FR-2010-12-27/pdf/2010-32153.pdf#page=1.

[9] 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 https://www.gpo.gov/fdsys/pkg/FR-2016-03-28/pdf/2016-06226.pdf.

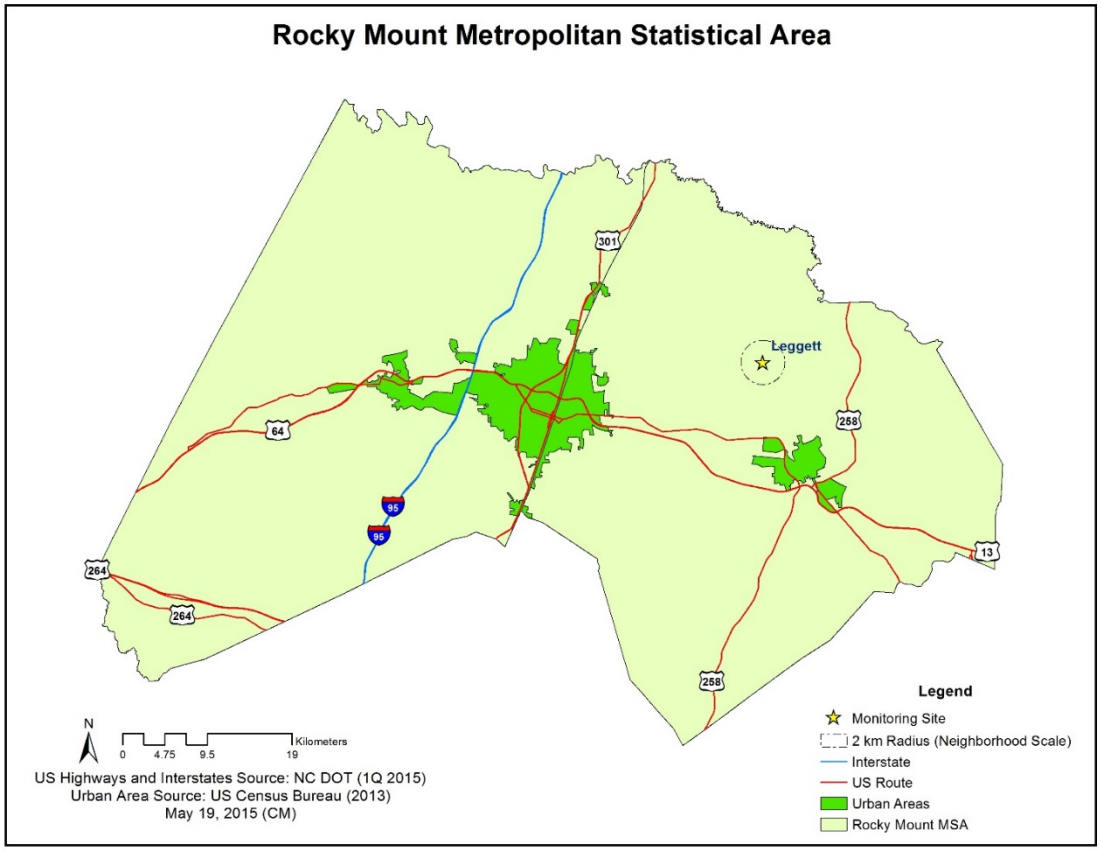


Figure D59. Monitoring site location in the Rocky Mount MSA

At the **Leggett** site, DAQ operates a seasonal ozone monitor and a non-regulatory continuous fine particle monitor. The ozone monitor is no longer required for the MSA. In April 2011, the division added a continuous fine particle monitor to the site to enable real-time fine particle air quality index reporting and fine particle forecasting. Figure D65 through Figure D73 show the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest.

Figure D60. Leggett seasonal ozone and air quality index fine particle monitoring site

Figure D61. Looking north from the Leggett site

Figure D62. Looking northwest from the Leggett site

Figure D63. Looking west from the Leggett site

Figure D64. Looking southwest from the Leggett site

Figure D65. Looking northeast from the Leggett site

Figure D66. Looking east from the Leggett site

Figure D67. Looking southeast from the Leggett site

Figure D68. 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 any permitted facilities located within its bounds that emit 0.5 tons or more of lead per year. [10]

The 2015 changes to the **ozone monitoring requirements** did not require additional monitoring in the Rocky Mount MSA. The MSA already has the minimum number of monitors required by 40 CFR Part 58, Appendix D for population exposure monitoring in urban areas. Starting in 2017, the seasonal ozone monitoring begins a month earlier on March 1 instead of April 1.

The 2010 **nitrogen dioxide monitoring** requirements did not add any monitors to the Rocky Mount MSA because its population is less than 500,000. The 2010 sulfur dioxide monitoring requirements also did not require additional monitors in this area 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 MiSA consists of Wilson County. There currently is no Metropolitan Statistical Area in Wilson County; however, the Wilson MiSA is located here. The Wilson area population is staying about the same or shrinking somewhat. The North Carolina Office of State Budget and Management estimates it lost 113 or 0.2 percent of its population between July 1, 2018 and April 1, 2010.[11] DAQ currently does not operate any monitoring sites in the Wilson MiSA.

The **lead monitoring** requirements in December 2010 affected the Wilson MiSA because it had a permitted facility located within its bounds that emitted more than 0.5 tons per year of lead.[12] Saint-Gobain Containers, LLC, reported 2009 lead emissions of 0.84 tons. 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 fenceline is 0.015 micrograms per cubic meter, well below the 0.075 micrograms per cubic meter or 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 was good until 2020.[13] The division requested a renewal of the waiver in 2020. The EPA declined to renew the waiver because in 2018, Ardagh Glass, the former Saint Gobain Containers,

[10]United States Environmental Protection Agency. (2018). *TRI Explorer* (2018 Updated Dataset (released April 2020)) [Internet database]. Retrieved from https://enviro.epa.gov/triexplorer/tri_release.facility, (April 11, 2020).
[11] North Carolina Office of State Budget and Management, Aspects of Municipal Population Change, April 1, 2010 to July 1, 2018, last updated Sept. 16, 2019, available on the worldwide web at https://files.nc.gov/ncosbm/demog/municipalfastgrowth_2018.html, accessed May 19, 2020.
[12] Data obtained from the DAQ emission inventory database available online at https://xapps.ncdenr.org/aq/ToxicsReport/ToxicsReportFacility.jsp?ibeam=true&county_code=195&year=2009&sorting=103&overridetype=All&pollutant=153.
[13] 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.

reported 427.1 pounds of lead emissions,[14] which is less than the 0.5 ton threshold requiring a waiver. In 2019, Ardagh Glass reported 460.2 pounds of lead emissions. [15]

Changes to the **ozone monitoring** requirements in 2015 did not require additional monitoring in the Wilson MiSA. Until it becomes an MSA, it does not have to meet population exposure monitoring requirements for urban areas. The Office of Management and Budget did not reclassify the Wilson MiSA as an MSA in February 2013 when it revised the MSA classifications. The next scheduled revision for MSA classifications is in 2023; however, sometimes the Office of Management and Budget adjusts classifications between the scheduled revisions. Currently, the Wilson municipality is almost one thousand people short of meeting the classification requirements for a metropolitan statistical area.

The 2010 **nitrogen dioxide monitoring** rule did not require the Wilson MiSA 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 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 MiSA consists of Lee County. DAQ started a monitoring site in the Sanford MiSA in November 2013. The Blackstone monitoring station supported a special study to monitor baseline ambient air near potential shale-gas development areas in Lee County.[16] Ozone monitoring started on Nov. 1, 2013 and a continuous fine particle monitor started Jan. 1, 2014. In December 2014, DAQ added a sulfur dioxide monitor and nitrogen dioxide monitor. The site also monitored for volatile organic and carbonyl toxic compounds and hydrocarbons. DAQ shut down this monitoring station on July 31, 2018. Figure D74 shows where the site was located. For more information on this site, see the report: Baseline Air Quality Assessment: Deep River Basin, Lee County North Carolina[17] or the 2018-2019 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.[18]

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[14] United States Environmental Protection Agency. (2018). *TRI Explorer* (2018 Updated Dataset (released April 2020)) [Internet database]. Retrieved from https://enviro.epa.gov/triexplorer/tri_release.facility, (April 11, 2020)
[15] United States Environmental Protection Agency. (2021). *TRI Explorer* (2019 Updated Dataset (released March 2021)) [Internet database]. Retrieved from https://enviro.epa.gov/triexplorer/tri_release.facility, (May 1, 2021)
[16] 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, Updated Nov. 8, 2013. Available online at https://files.nc.gov/ncdeq/Air%20Quality/monitor/specialstudies/DAQ_Project_Plan.pdf, accessed on May 19, 2019.
[17] Department of Environmental Quality, Division of Air Quality, Baseline Air Quality Assessment: Deep River Basin, Lee County North Carolina, July 12, 2018. Available on the worldwide web at https://files.nc.gov/ncdeq/Air+Quality/monitor/specialstudies/blackstone_report/Baseline_Air_Quality_Assessment_Deep_River_Basin_Final_Report.pdf.
[18] Department of Environmental Quality, Division of Air Quality, 2018-2019 Annual Monitoring Network Plan for the North Carolina Division of Air Quality, Volume 2, Site Descriptions by Division of Air Quality Regional Office

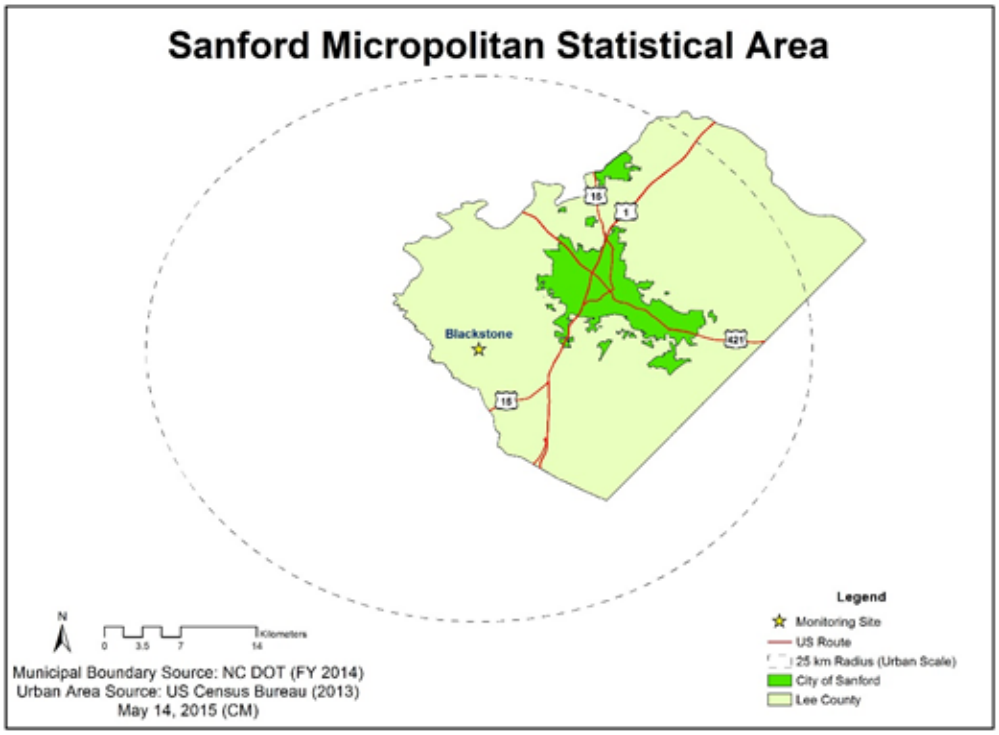

Figure D69. Monitoring site location in the Sanford MiSA

The Sanford MiSA was not required to do any lead monitoring to comply with 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.[19]

Changes to the **ozone monitoring** requirements in 2015 did not require additional ozone monitoring in the Sanford MiSA. Until the Sanford municipality grows large enough for the Office of Management and Budget to classify it as an MSA, it does not have to meet population exposure monitoring requirements for urban areas.

The 2010 **nitrogen dioxide monitoring** rule did not require the Sanford MiSA 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. The 2010 **sulfur dioxide monitoring** rule also did not require any sulfur dioxide monitoring in this area 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.

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and Metropolitan Statistical Area, D. the Raleigh Monitoring Region, June 29, 2018. Available on the worldwide web at http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=10637.

[19] Data obtained from the DAQ emission inventory database, available on the worldwide web at https://xapps.ncdenr.org/aq/ToxicsReport/ToxicsReportFacility.jsp?ibeam=true&year=2016&pollutant=153&county_code=105, accessed April 23, 2018.

Appendix D.1 Annual Network Site Review Forms for 2020

Durham Armory in Durham

Bushy Fork

Butner

Northampton County

West Johnston in Johnston County

Millbrook in Raleigh

Triple Oak Road in Cary

Leggett

Site Review Form Calendar Year 2020

Site Information

Region RRO	**Site Name** Durham Armory	**AQS Site # 37-063-0015**
Street Address 801 Stadium Drive		**City** Durham, NC
Urban Area Choose an item.	**Core-based Statistical Area** Choose an item.	

Enter Exact		
Latitude 36.032977	**Longitude** -78.904025	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**GPS** **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		**106**

Name of nearest road to inlet probe Stadium Drive ADT _____ Year Choose an item _____

Comments: As of 2020 Stadium Drive has no ADT data available. Stadium Dr. is 37 m from shelter

Distance of site to nearest major road (m) 132.00 Direction from site to nearest major road W

Name of nearest major road Duke St./US 501 ADT 34500 Year 2019

Comments: _____

Site located near electrical substation/high voltage power lines? Yes ☐ No ☒

Distance of site to nearest railroad track (m) _____ Direction to RR ___ ☒NA

OPTIONAL 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 is located on NC National Guard property. On occasion, the Guard will sponser events (internal and external) that lead to overflow parking around the monitoring site (<2m). These events are sporadic. Also, the Armory has a stack associated with a boiler. It is used infrequently but is in operation.

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA ☒ SO_2 (NAAQS) ☐ SO_2 (trace-level) ☐ NO_2 (NAAQS) ☐ $HSNO_y$ ☒ O_3 ☐ NH_3 ☐ Hydrocarbon ☐ Air Toxics ☐ CO (trace-level)	☐ General/Background_____ ☐ Highest Concentration_____ ☐ Max O3 Concentration_____ ☒ Population ExposureSO2 & O3 ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☒ UrbanSO2 & O3 ☐ Regional_____	☒ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE_____ ☐ Unofficial PAMS_____

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 3.90

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐

Actual measured distance from outer edge of probe to supporting structure (meters) 1.20

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 ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐ *Number of trees within 10 meters _____

*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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) 40 Direction from probe to nearest traffic lane N

Site Review Form Calendar Year 2020

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min ☐ PM2.5 FRM ☐ PM10 FRM ☐ PM10 Cont. (BAM) ☐ PM10-2.5 FRM ☒ PM10-2.5 BAM ☐ PM2.5 Cont. (BAM)	☐ General/Background _____ ☐ Highest Concentration _____ ☒ Population Exposure _____ ☐ Source Oriented _____ ☐ Transport _____ ☐ Welfare Related Impacts _____	☐ Micro _____ ☐ Middle _____ ☒ Neighborhood _____ ☐ Urban _____ ☐ Regional _____	☒ SLAMS _____ ☐ SPM_____ **Monitor NAAQS Exclusion** ☐ NONREGULATORY_____

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____
Actual measured distance from probe inlet to ground (meters) 2.7

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from outer edge of probe inlet to supporting structure (meters) .8 Yes ☐ No ☒

Distance (Y) between outer edge of probe inlets of any low volume monitor and any other low volume monitor at the site = 1 m or greater? Yes ☒ No ☐ NA ☐

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, BAM & BAM) Located at Site? *Yes ☐ (answer *'d questions) No ☒ NA ☐

* Entire inlet opening of collocated PM 2.5 samplers (X) within 2 to 4 m of each other? Yes ☐ No ☐ Give actual (meters) _____
*Are collocated PM2.5 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 site to measure PM10-2.5? *Yes ☒ (answer *'d questions) No ☐ NA ☐

* Entire inlet opening of collocated PM10 and PM2.5samplers for PM10-2.5 (X) within 2 to 4 m of each other? Yes ☒ No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other? Yes ☒ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐ *Number of trees within 10 meters _____
*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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) 33 Direction from probe to nearest traffic lane N

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:

Date of Last Site Pictures 11/2/2020 New Pictures Submitted? Yes ☒ No ☐

Reviewer KLT Date 11/2/2020

Ambient Monitoring Coordinator TTSkelding DateJune 28, 2021

Site Review Form Calendar Year 2020

Site Information

Region RRO	**Site Name** Bushy Fork	**AQS Site # 37-145-0003**
Street Address-7901 Burlington Rd		**City Hurdle Mills**
Urban Area ROXBORO	**Core-based Statistical Area** Durham, NC	
Enter Exact		
Latitude 36.3069	**Longitude** -79.0920	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** | **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		205.00

Name of nearest road to inlet probe Nc Hwy 49 ADT 3000 Year latest available 2018

Distance of ozone probe to nearest traffic lane (m) 123 Direction from ozone probe to nearest traffic lane SSE

Comments: N/A

Name of nearest major road NC Hwy 49 ADT 3000 Year 2018

Distance of site to nearest major road (m) 123.00 Direction from site to nearest major road SSE

Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track (m) _____ Direction to RR ___	☒NA
OPTIONAL 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.

_____

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Site Type
☒ O_3	☒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 (from ground) 2-15 m? Yes ☒ No ☐

Give actual measured height from ground (meters) 4.20

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) _____

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐ *Number of trees within 10 meters _____

*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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 ☐

Site Review Form Calendar Year 2020

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: _____

Date of Last Site Pictures: December 30, 2019 New Pictures Submitted? Yes ☐ No ☒

Reviewer _____ Date: _____

Ambient Monitoring Coordinator TT Skelding Date: June 28, 2021

Instructions:

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

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

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

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

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

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

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

Site Review Form Calendar Year 2020

Site Information

Region RRO	**Site Name** Butner	**AQS Site # 37-077-0001**
Street Address-800 Central Ave		**City Butner**
Urban Area BUTNER	**Core-based Statistical Area** None	
Enter Exact		
Latitude 36.1413	**Longitude** -78.7681	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** | **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		121.00

Name of nearest road to inlet probe West G St ADT 0 Year latest available ____

Distance of ozone probe to nearest traffic lane (m) 85 Direction from ozone probe to nearest traffic lane SE

Comments: Traffic count unavailable for G street

Name of nearest major road Central Ave ADT 9200 Year 2018

Distance of site to nearest major road (m) 197.00 Direction from site to nearest major road ENE

Comments: _____

Site located near electrical substation/high voltage power lines?		Yes ☐ No ☒
Distance of site to nearest railroad track	(m) _____ Direction to RR ___	☒NA
OPTIONAL Distance of site to nearest power pole w/transformer	(m) _____	Direction ___

Distance between site and drip line of water tower (m) **241** Direction from site to water tower **NE** ☐**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.

_____

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Site Type
☒ O_3	☒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 (from ground) 2-15 m? Yes ☒ No ☐

Give actual measured height from ground (meters) 4.00

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) _____

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐ *Number of trees within 10 meters _____

*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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 ☐

Site Review Form Calendar Year 2020

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: _____

Date of Last Site Pictures: November 4, 2019 New Pictures Submitted? Yes ☐ No ☒

Reviewer _____ Date: _____

Ambient Monitoring Coordinator TT Skelding Date: June 28, 2021

Instructions:

Trees: The probe or inlet must be at least 10 meters or further from the drip line of trees. A distance of at least 20 meters between the probe and any tree or trees is preferred.
Obstacles: An obstacle is anything that restricts air flow. A tree can be an obstacle because it has branches and leaves that restrict the flow of air but a pole is not considered to be an obstacle. To avoid interference from obstacles, the probe or inlet must have unrestricted airflow and be located away from obstacles. The distance from the obstacle to the probe or inlet must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path.

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

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

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

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

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

Site Review Form Calendar Year 2020

Site Information

Region RRO	**Site Name** Northampton	**AQS Site # 37-131-0003**
Street Address 250 Hurricane Drive		**City** Gaston
Urban Area Not in an Urban Area	**Core-based Statistical Area** Choose an item.	
Enter Exact		
Latitude 36.511657	**Longitude** -77.655277	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** **Explanation: Google Maps**
Elevation Above/below Mean Sea Level (in meters)		**58**

Name of nearest road to inlet probe Hurricane Drive ADT _____ Year Choose an item _____

Comments: Not Available

Distance of site to nearest major road (m) 803.57 Direction from site to nearest major road E

Name of nearest major road Old E.poria Rd ADT 2000 Year 2018

Comments: ADT of 2000 is an apporximation between the 2400 and 830 readings on NCDOT ADT map. 1300m South of site. NC-46 ADT~6800

Site located near electrical substation/high voltage power lines? Yes ☐ No ☒

Distance of site to nearest railroad track (m) _____ Direction to RR ___ ☒NA

OPTIONAL 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.

_____

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA ☐ SO_2 (NAAQS) ☐ SO_2 (trace-level) ☒ NO_2 (NAAQS) ☐ $HSNO_y$ ☐ O_3 ☐ NH_3 ☐ Hydrocarbon ☐ Air Toxics ☐ CO (trace-level)	☒ General/BackgroundNO2 ☐ Highest Concentration_____ ☐ Max O3 Concentration_____ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☒ NeighborhoodNO2 ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____ ☒ SPMNO2 **Monitor Network Affiliation** ☐ NCORE_____ ☐ Unofficial PAMS_____

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 3.61

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) 1.14

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 ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐ *Number of trees within 10 meters _____

*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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) -266ht Direction from probe to nearest traffic lane SE

Site Review Form Calendar Year 2020

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min ☐ PM2.5 FRM ☐ PM10 FRM ☐ PM10 Cont. (BAM) ☐ PM10-2.5 FRM ☐ PM10-2.5 BAM ☒ PM2.5 Cont. (BAM)	☒ General/Background _____ ☐ Highest Concentration _____ ☐ Population Exposure _____ ☐ Source Oriented _____ ☐ Transport _____ ☐ Welfare Related Impacts _____	☐ Micro _____ ☐ Middle _____ ☒ Neighborhood _____ ☐ Urban _____ ☐ Regional _____	☐ SLAMS _____ ☒ SPM_____ **Monitor NAAQS Exclusion** ☐ NONREGULATORY_____

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____
Actual measured distance from probe inlet to ground (meters) 2.44

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from outer edge of probe inlet to supporting structure (meters) _____ Yes ☒ No ☐

Distance (Y) between outer edge of probe inlets of any low volume monitor and any other low volume monitor at the site = 1 m or greater? Yes ☒ No ☐ NA ☐

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, BAM & BAM) Located at Site? *Yes ☐ (answer *'d questions) No ☒ NA ☐

* Entire inlet opening of collocated PM 2.5 samplers (X) within 2 to 4 m of each other? Yes ☐ No ☐ Give actual (meters) _____
*Are collocated PM2.5 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 site to measure PM10-2.5? *Yes ☐ (answer *'d questions) No ☒ NA ☐

* Entire inlet opening of collocated PM10 and PM2.5samplers for PM10-2.5 (X) within 2 to 4 m of each other? Yes ☐ No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐ *Number of trees within 10 meters _____
*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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) _____ Direction from probe to nearest traffic lane ___

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:

Date of Last Site Pictures _____ New Pictures Submitted? Yes ☐ No ☒

Reviewer _____Date _____

Ambient Monitoring Coordinator TT Skelding _____DateJune 28, 2021_____

Site Review Form Calendar Year 2020

Site Information

Region RRO	**Site Name** West Johnston	**AQS Site # 37-101-0002**
Street Address-1338 Jack Road		**City** Clayton
Urban Area Choose an item.	**Core-based Statistical Area** Rocky Mount, NC	
Enter Exact		
Latitude 35.590966	**Longitude** -78.462213	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** **Explanation: Google Maps**
Elevation Above/below Mean Sea Level (in meters)		**82**

Name of nearest road to inlet probe Jack Rd 19m SW of shelter ADT 1900 Year Choose an item 2017

Comments: NA

Distance of site to nearest major road (m) 2020.00 Direction from site to nearest major road NE

Name of nearest major road US Bypass 70 ADT 28500 Year 2018

Comments: Interpolated ADT 26k - 32k

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track (m) _____ Direction to RR ___	☒NA
OPTIONAL 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.

hhhttttththt

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA ☐ SO_2 (NAAQS) ☐ SO_2 (trace-level) ☐ NO_2 (NAAQS) ☐ $HSNO_y$ ☒ O_3 ☐ NH_3 ☐ Hydrocarbon ☐ Air Toxics ☐ CO (trace-level)	☒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 ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 3.60

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) 1.20

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 ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐ *Number of trees within 10 meters _____

*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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) 96 Direction from probe to nearest traffic lane SSE

Site Review Form Calendar Year 2020

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min ☐ PM2.5 FRM ☐ PM10 FRM ☐ PM10 Cont. (BAM) ☐ PM10-2.5 FRM ☐ PM10-2.5 BAM ☒ PM2.5 Cont. (BAM)	☒ General/Background _____ ☐ Highest Concentration _____ ☒ Population Exposure _____ ☐ Source Oriented _____ ☐ Transport _____ ☐ Welfare Related Impacts _____	☐ Micro _____ ☐ Middle _____ ☒ Neighborhood _____ ☐ Urban _____ ☐ Regional _____	☒ SLAMS _____ ☐ SPM_____ **Monitor NAAQS Exclusion** ☐ NONREGULATORY_____

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____
Actual measured distance from probe inlet to ground (meters) 2.3

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from outer edge of probe inlet to supporting structure (meters) 2.1 Yes ☒ No ☐

Distance (Y) between outer edge of probe inlets of any low volume monitor and any other low volume monitor at the site = 1 m or greater? Yes ☐ No ☒ NA ☐

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, BAM & BAM) Located at Site? *Yes ☐ (answer *'d questions) No ☒ NA ☐

* Entire inlet opening of collocated PM 2.5 samplers (X) within 2 to 4 m of each other? Yes ☐ No ☐ Give actual (meters) _____
*Are collocated PM2.5 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 site to measure PM10-2.5? *Yes ☐ (answer *'d questions) No ☒ NA ☐

* Entire inlet opening of collocated PM10 and PM2.5samplers for PM10-2.5 (X) within 2 to 4 m of each other? Yes ☐ No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐ *Number of trees within 10 meters _____
*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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) _____ Direction from probe to nearest traffic lane ___

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:

Date of Last Site Pictures 12/3/2019 New Pictures Submitted? Yes ☐ No ☒

Reviewer _____Date _____

Ambient Monitoring Coordinator TT Skelding _____DateJune 28, 2021_____

Site Review Form Calendar Year 2020

Site Information

Region RRO	**Site Name** Millbrook NCore	**AQS Site # 37-183-0014**
Street Address-3801 Spring Forest Rd		**City** RALEIGH
Urban Area RALEIGH	**Core-based Statistical Area** Choose an item.	

Enter Exact		
Latitude 35.856214	**Longitude** -78.574147	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** / **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		**103**

Name of nearest road to inlet probe Spring Forest Rd ADT 19000 Year latest available 2017

Comments: Spring Forest Road is 44 meters south of the site

Distance of site to nearest major road (m) 632 west

Name of nearest major road US-1 / Capital Blvd ADT 51000 Year 2017 Comments: The 51000 ADT is the average of the NC DOT ADT of the N and S counts of US-1/SpringForest intersection which are 53000 and 48000, respectively

Site located near electrical substation/high voltage power lines?	Yes ☐ No X
Distance of site to nearest railroad track (m) _____ Direction to RR ___	XNA
Distance between site and drip line of water tower (m) _____ Direction from site to water tower _____	**XNA**

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

Twice a day, at the two schools adjacent to the site have carpool lanes have influenced emissions readings as the vehicles idle for 20-60 mins due west of the site (15-40m depending on the school). The housing complexes across the street have units with fireplaces. Deliveries to the daycare facility due east, can cause high emissions readings if a diesel truck idles for long.

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA X SO_2 (trace-level) X NO_2 (NAAQS) X O_3 ☐ Hydrocarbon X Air Toxics -VOC XAir Toxics - Aldehydes XCO (trace-level)	XGeneral/Background CO, VOC XHighest ConcentrationNO2 XMax O3 ConcentrationCO, O3 XPopulation Exposure SO2, NO2,O3, CO, VOC, ALDEHYDE ☐Source Oriented_____ ☐Transport_____ ☐Upwind Background_____ ☐Welfare Related Impacts _____	XMicro CO,VOC XMiddle NO2 XNeighborhood SO2, NO2, O3 ☐Urban_____ ☐Regional_____	XSLAMS SO2, NO2, O3, CO, VOC, ALDEHYDE XSPM NO2 **Monitor Network Affiliation** XNCORE SO2, NO2, O3, CO, VOC, ALDEHYDE ☐Unofficial PAMS_____

Probe inlet height (from ground) 2-15 m? Yes X No ☐ Give actual measured height from ground (meters) 4.86

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes X No☐
Actual measured distance from outer edge of probe to supporting structure (meters) 2.23

Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes X No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes X *No ☐ (answer *'d questions)
*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) NOTE: tree at 10.5 meters NNE of site was removed December 2019 Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No X

*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) 39 Direction from probe to nearest traffic lane S___

Site Review Form Calendar Year 2020

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min X PM2.5 FRM ☐ PM10 FRM X PM10 Cont. (BAM) ☐ PM10-2.5 FRM X PM10-2.5 BAM X PM2.5 Cont (T640X) X PM2.5 Cont. (BAM) X PM2.5 Spec. (SASS) X PM2.5 Spec. (URG) X PM2.5 Cont. Nitrate X PM2.5 Cont. Sulfate PM2.5 Aethalometer	☐General/Background _____ XHighest Concentration _____ XPopulation Exposure _____ ☐Source Oriented _____ ☐Transport _____ ☐Welfare Related Impacts _____	XMicro PM2.5 CONT. NO3, SO4, ☐Middle _____ ☐Neighborhood _____ ☐Urban _____ ☐Regional _____	XSLAMS PM2.5 FRM, BAM PM 2.5/PM10 XSPM_ PM2.5 Spec.(SASS), PM2.5 Spec.(URG), PM2.5 Cont., NO3, SO4, **Monitor Network Affiliation** xNCORE PM2.5 FRM, BAM PM2.5/PM10 x SUPPLEMENTAL SPECIATION PM2.5 Spec.(SASS), PM2.5 Spec.(URG), PM2.5 Cont. NO3, SO4 **Monitor NAAQS Exclusion** x NONREGULATORY PM2.5 Cont., NO3, SO4

Probe inlet height (from ground) ☐ < 2 m _____ x 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____
Actual measured distance from probe inlet to ground (meters) PM2.5 FRM (2.4),BAM (2.62),PM2.5 SASS(2.1), PM2.5 URG (2.3),PM2.5 Cont, T640X(3.14),

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from outer edge of probe inlet to supporting structure (meters) PM2.5 FRM (2.1), SASS(2.1), URG (2.07), PM2.5/10 Cont.( ), T640X(2.48), Aeth (1.15), SO4 (0.85), NO3 (0.85 Yes x No x

Distance (Y) between outer edge of probe inlets of any low volume monitor and any other low volume monitor at the site = 1 m or greater? Yes x No ☐ NA ☐

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, BAM & BAM) Located at Site? *Yes x (answer *'d questions) No ☐ NA ☐
* Entire inlet opening of collocated PM 2.5 samplers (X) within 1 to 4 m of each other? Yes x No ☐ Give actual (meters) 4
*Are collocated PM2.5 sampler inlets within 1 m vertically of each other? Yes x No ☐ Give actual (meters) 3

Is an URG 3000 monitor collocated with a SASS monitor at the site? *Yes x (answer *'d questions) No ☐ NA ☐
* Entire inlet opening of collocated speciation samplers inlets (X) within 1 to 4 m of each other? Yes x No ☐
Give actual (meters) 2.2
* Are collocated speciation sampler inlets within 1 m vertically of each other? Yes x No ☐ Give actual (meters)_____

Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the site to measure PM10-2.5? *Yes x (answer *'d questions) No ☐ NA ☐
* Entire inlet opening of collocated PM10 and PM2.5samplers for PM10-2.5 (X) within 1 to 4 m of each other? Yes x No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other? Yes x No ☐

Is probe > 20 m from the nearest tree drip line? Yes x *No ☐ (answer *'d questions)
*Is probe > 10 m from the nearest tree drip line? Yes ☐ *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 x
*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) 27 Direction from probe to nearest traffic lane s

Site Review Form Calendar Year 2020

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA XNO$_y$ (trace-level)	☐ General/Background_____ ☐ Highest Concentration_____ ☐ Max O3 Concentration_____ XPopulation Exposure_____ ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ XNeighborhood _____ ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____NOY ☐ SPM _____ **Monitor Network Affiliation** X NCORE _____

Probe inlet height (from ground) 10-15 m? Yes X No ☐
Actual measured distance from probe inlet to ground (meters) 10.50

Distance of outer edge of probe inlet from horizontal and/or vertical supporting structure > 1 m? Yes Y No ☐
Actual measured distance from outer edge of probe inlet to supporting structure (meters) 7.4

Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes X No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes X *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *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 X

*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) _____ Direction from probe to nearest traffic lane ___

RECOMMENDATIONS:

1) Maintain current site status? Yes X *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 _____ New Pictures Submitted? Yes X No ☐
Reviewer _____Date _____
Ambient Monitoring Coordinator TT SKELDING Date 06/28/2021

Site Review Form Calendar Year 2020

Site Information

Region RRO	**Site Name** Triple Oak	**AQS Site # 37-**183-0021
Street Address-2826 Triple Oak Road		**City** Cary
Urban Area RALEIGH	**Core-based Statistical Area** Raleigh, NC	
Enter Exact		
Latitude 35.865116	**Longitude** -78.819597	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** | **Explanation: Google Maps**
Elevation Above/below Mean Sea Level (in meters)		96

Name of nearest road to inlet probe US Interstate 40 ADT 162000 Year latest available2017
Comments: Nearest Road and Nearest Major Road are the same.
Distance of site to nearest major road (m) 18.25 Direction from site to nearest major road SW
Name of nearest major road Same ADT _____ Year _____
Comments: See above.

Site located near electrical substation/high voltage power lines? Yes ☐ No ☒

Distance of site to nearest railroad track (m) _____ Direction to RR ___ ☒NA

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.

1.9 km to NE-RDU airport runway. 320m to S-Triangle Factory Shops mall. 650m to N-multiple distribution warehouses. 620m to SE-I40 exit #284 (Airport Blvd) multiple hotels and restaurants. 1.3km to NW-I40 exit #283 (I-540).

Parameters	Monitoring Objective	Scale	Monitor Type
☒NO_2 (Near Road only) ☒CO (Near Road only)	☐Highest Concentration_____ ☒Population Exposure_____ ☒Source Oriented_____ ☐Transport_____ ☐Welfare Related Impacts _____	☒Micro_____	☒SLAMS _____ ☐SPM_____

Probe inlet height (from ground) 2-7 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 4.20
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 inlet to supporting structure (meters) 1.40
Distance of outer edge of probe inlet from other monitoring probe inlets > 0.25 m? Yes ☒ No ☐ NA ☐

Is probe > 20 m from 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) 11.60 Direction from probe to tree NE *Height of tree (m) 30.00

Are there any obstacles to air flow? *Yes ☒ (answer *'d questions) No ☐
*Identify obstacle Tree Line Distance from probe inlet (m) 11.60 Direction from probe inlet to obstacle NE
*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) 18 Direction from probe to nearest traffic lane SW

NO_2 and CO 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:

Date of Last Site Pictures 11/21/19New Pictures Submitted? Yes ☐ No ☒
Reviewer S Helms Date January 1, 2021
Ambient Monitoring Coordinator TTSkelding DateJune 28, 2021

Site Review Form Calendar Year 2020

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min ☐ PM2.5 FRM ☐ PM10 FRM ☐ PM10 Cont. (BAM) ☐ PM10-2.5 FRM ☐ PM10-2.5 BAM ☒ PM2.5 Cont. (BAM)	☐ General/Background _____ ☐ Highest Concentration _____ ☒ Population Exposure _____ ☒ Source Oriented _____ ☐ Transport _____ ☐ Welfare Related Impacts _____	☐ Micro _____	☒ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☒ Near Road I-40 **Monitor NAAQS Exclusion** ☐ NONREGULATORY_____

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____
Actual measured distance from probe inlet to ground (meters) 4.9

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from outer edge of probe inlet to supporting structure (meters) 2.1 Yes ☒ No ☐

Distance (Y) between outer edge of probe inlets of any low volume monitor and any other low volume monitor at the site = 1 m or greater? Yes ☐ No ☐ NA ☒

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, BAM & BAM) Located at Site? *Yes ☐ (answer *'d questions) No ☒ NA ☐

* Entire inlet opening of collocated PM 2.5 samplers (X) within 1 to 4 m of each other? Yes ☐ No ☐ Give actual (meters) _____
*Are collocated PM2.5 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 site to measure PM10-2.5? *Yes ☐ (answer *'d questions) No ☒ NA ☐

* Entire inlet opening of collocated PM10 and PM2.5 samplers for PM10-2.5 (X) within 2 to 4 m of each other? Yes ☐ No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐

Is probe > 20 m from 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) 11.00 Direction from probe to tree NE *Height of tree (m) 30.00

Are there any obstacles to air flow? *Yes ☒ (answer *'d questions) No ☐

*Identify obstacle Tree Line Distance from probe inlet (m) 11 Direction from probe inlet to obstacle NE
*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) 18.25 Direction from probe to nearest traffic lane SW

PM 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:

Reviewer Stephen Helms Date May 18, 2021

Ambient Monitoring Coordinator _____ Date_____

Site Review Form Calendar Year 2020

Site Information

Region RRO	**Site Name** Leggett	**AQS Site # 37-065-0099**
Street Address 7589 NC-33 NW		**City** Leggett
Urban Area Choose an item.	**Core-based Statistical Area** Rocky Mount, NC	
Enter Exact		
Latitude 35.988272	**Longitude** -77.584366	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** **Explanation: Google Maps**
Elevation Above/below Mean Sea Level (in meters)		20

Name of nearest road to inlet probe NC97 ADT 2600 Year Choose an item 2018

Comments: 96m to road, SSE

Distance of site to nearest major road (m) 92.20 Direction from site to nearest major road ENE

Name of nearest major road NC33 ADT 1200 Year 2018

Comments: NC33 is 400m east of site. US64(alt) and US64 are south (6.9 / 11.4 km respctv) (ADT=5000 / 17500 rspctv)

Site located near electrical substation/high voltage power lines? Yes ☐ No ☒

Distance of site to nearest railroad track (m) _____ Direction to RR ___ ☒NA

OPTIONAL 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.

hhhttttththt

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA ☐ SO_2 (NAAQS) ☐ SO_2 (trace-level) ☐ NO_2 (NAAQS) ☐ $HSNO_y$ ☒ O_3 ☐ NH_3 ☐ Hydrocarbon ☐ Air Toxics ☐ CO (trace-level)	☒ 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 ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 3.80

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) 1.20

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 ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐ *Number of trees within 10 meters _____

*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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) 96 Direction from probe to nearest traffic lane SSE

Site Review Form Calendar Year 2020

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min ☐ PM2.5 FRM ☐ PM10 FRM ☐ PM10 Cont. (BAM) ☐ PM10-2.5 FRM ☐ PM10-2.5 BAM ☒ PM2.5 Cont. (BAM)	☒ General/Background _____ ☐ Highest Concentration _____ ☒ Population Exposure _____ ☐ Source Oriented _____ ☐ Transport _____ ☐ Welfare Related Impacts _____	☐ Micro _____ ☐ Middle _____ ☒ Neighborhood _____ ☐ Urban _____ ☐ Regional _____	☒ SLAMS _____ ☐ SPM_____ **Monitor NAAQS Exclusion** ☐ NONREGULATORY_____

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____
Actual measured distance from probe inlet to ground (meters) 2.4

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from outer edge of probe inlet to supporting structure (meters) 2.1 Yes ☒ No ☐

Distance (Y) between outer edge of probe inlets of any low volume monitor and any other low volume monitor at the site = 1 m or greater? Yes ☐ No ☒ NA ☐

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, BAM & BAM) Located at Site? *Yes ☐ (answer *'d questions) No ☒ NA ☐

* Entire inlet opening of collocated PM 2.5 samplers (X) within 2 to 4 m of each other? Yes ☐ No ☐ Give actual (meters) _____
*Are collocated PM2.5 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 site to measure PM10-2.5? *Yes ☐ (answer *'d questions) No ☒ NA ☐

* Entire inlet opening of collocated PM10 and PM2.5samplers for PM10-2.5 (X) within 2 to 4 m of each other? Yes ☐ No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐ *Number of trees within 10 meters _____
*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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) _____ Direction from probe to nearest traffic lane ___

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:

Date of Last Site Pictures 12/10/2019 New Pictures Submitted? Yes ☐ No ☒

Reviewer _____Date _____

Ambient Monitoring Coordinator TT Skelding _____DateJune 28, 2021_____

Appendix D-2. Scale of Representativeness

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

a) 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 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

There are six basic exposures:

a) Sites located to determine the highest concentrations expected to occur in the area covered by the network.

b) Sites located to determine representative concentrations in areas of high population density.

c) Sites located to determine the impact on ambient pollution levels of significant sources or source categories.

d) Sites located to determine general background concentration levels.

e) Sites located to determine the extent of regional pollutant transport among populated areas.

f) Sites located to measure air-pollution impacts on visibility, vegetation damage or other welfare-based impacts and in support of secondary standards.

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

Table D-1. Site Type Appropriate Siting Scales

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