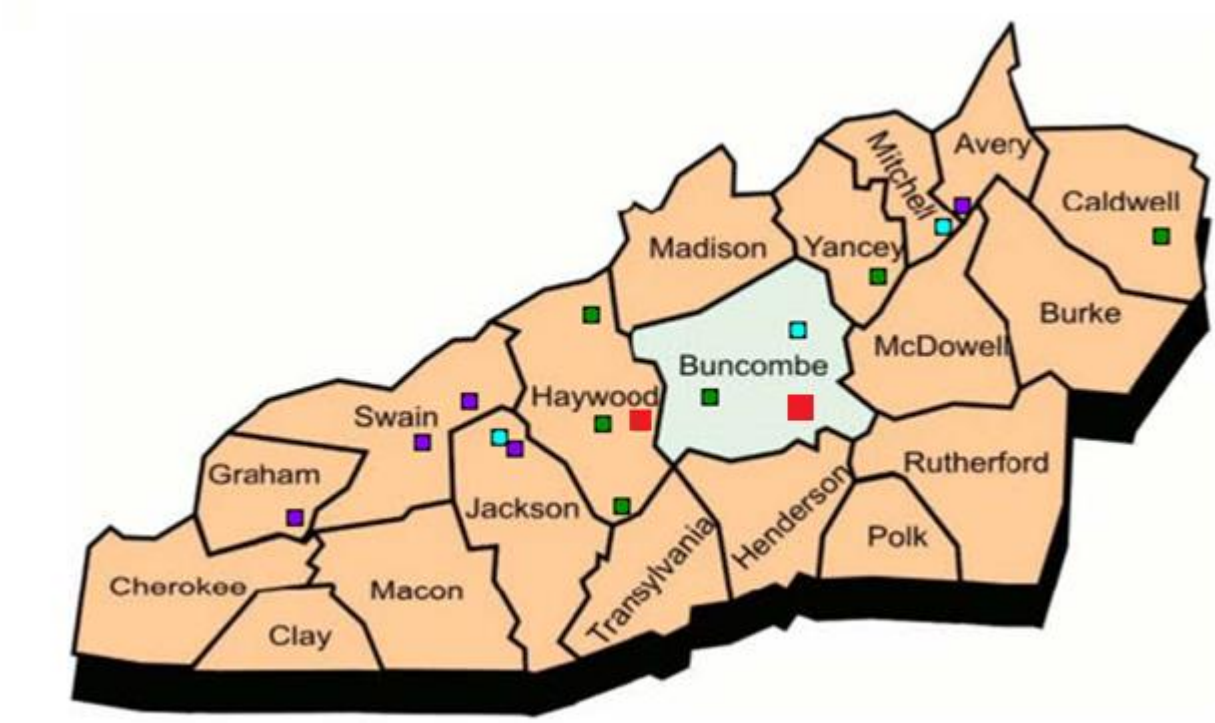
ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
MICHAEL A. ABRACZINSKAS
Director

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

Volume 2

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

A. The Asheville Monitoring Region



June 30, 2017

Nothing Compares℠

State of North Carolina | Department of Environmental Quality | Division of Air Quality
1641 Mail Service Center | 217 W. Jones Street, Suite 4000 | Raleigh, NC 27699-1641
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A. The Asheville Monitoring Region

The Asheville monitoring region, shown in Figure A-1, consists of four sections: (1) the mountain-top areas, those areas above 1.2 kilometers, Km, or 4,000 feet in elevation in Avery, Buncombe, Burke, Caldwell, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Madison, Macon, McDowell, Mitchell, Swain, Transylvania and Yancey counties, (2) the Asheville metropolitan statistical area, MSA, i.e., valley sites below 1.2 Km in Buncombe, Haywood, Henderson and Madison counties, (3) the non-MSA valley areas, those areas below 1.2 Km in elevation in Avery, Cherokee, Clay, Graham, Jackson, Macon, McDowell, Mitchell, Polk, Rutherford, Swain, Transylvania and Yancey counties and (4) the western portion of the Hickory-Lenoir-Morganton MSA, i.e., valley sites in Burke and Caldwell counties. This section of the monitoring plan focuses on the first three sections. Monitoring in Burke and Caldwell is covered in Section C, the Mooresville Monitoring Region.

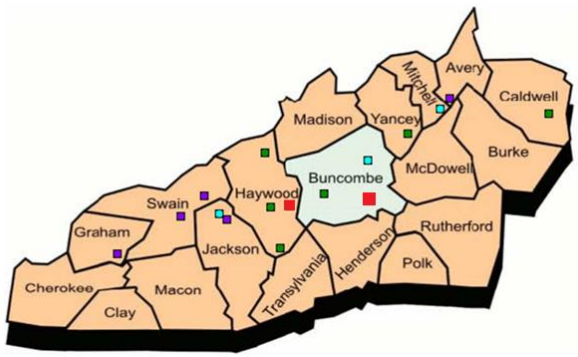

Figure A-1. The Asheville monitoring region
The squares show the approximate locations of the monitoring sites in this region.

(1) The Mountain Top Areas

The mountain top areas consist of elevations at or above 1.2 kilometers or 4,000 feet in 17 counties in western North Carolina: Avery, Buncombe, Burke, Caldwell, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Madison, Macon, McDowell, Mitchell, Swain, Transylvania and Yancey. There are no metropolitan or micropolitan statistical areas at these elevations. The DAQ currently operates four monitoring sites and the Eastern Band of Cherokee Indians, EBCI, operates one monitoring site on mountain tops at elevations greater than 1.2 kilometers. The United States Environmental Protection Agency, EPA, also operates a Clean Air Status and Trends Network, CASTNET, site at an elevation of 1.2 kilometers. The Barnett Knob tribal monitor is discussed further in the EBCI network plan. The Cranberry CASTNET site is discussed further in the CASTNET network plan.[1] One of the DAQ sites is an ozone-monitoring site located on Joanna Bald Mountain in the Joyce Kilmer National Wilderness Area. In addition to this site, the DAQ operates two high-elevation sites in Haywood County located in or near class 1 areas: Frying Pan in the Shining Rock Wilderness Area and Purchase Knob in the Great Smoky Mountains National Park. Another DAQ site is in Mount Mitchell State Park. The locations of the four DAQ and the tribal monitors are shown in Figure A-2.

[1] 2017 CASTNET Annual Network Plan, April 10, 2017, available on the worldwide web at https://www.epa.gov/sites/production/files/2017-04/documents/draft_castnet_2017_annual_network_plan.pdf, accessed May 1, 2017.

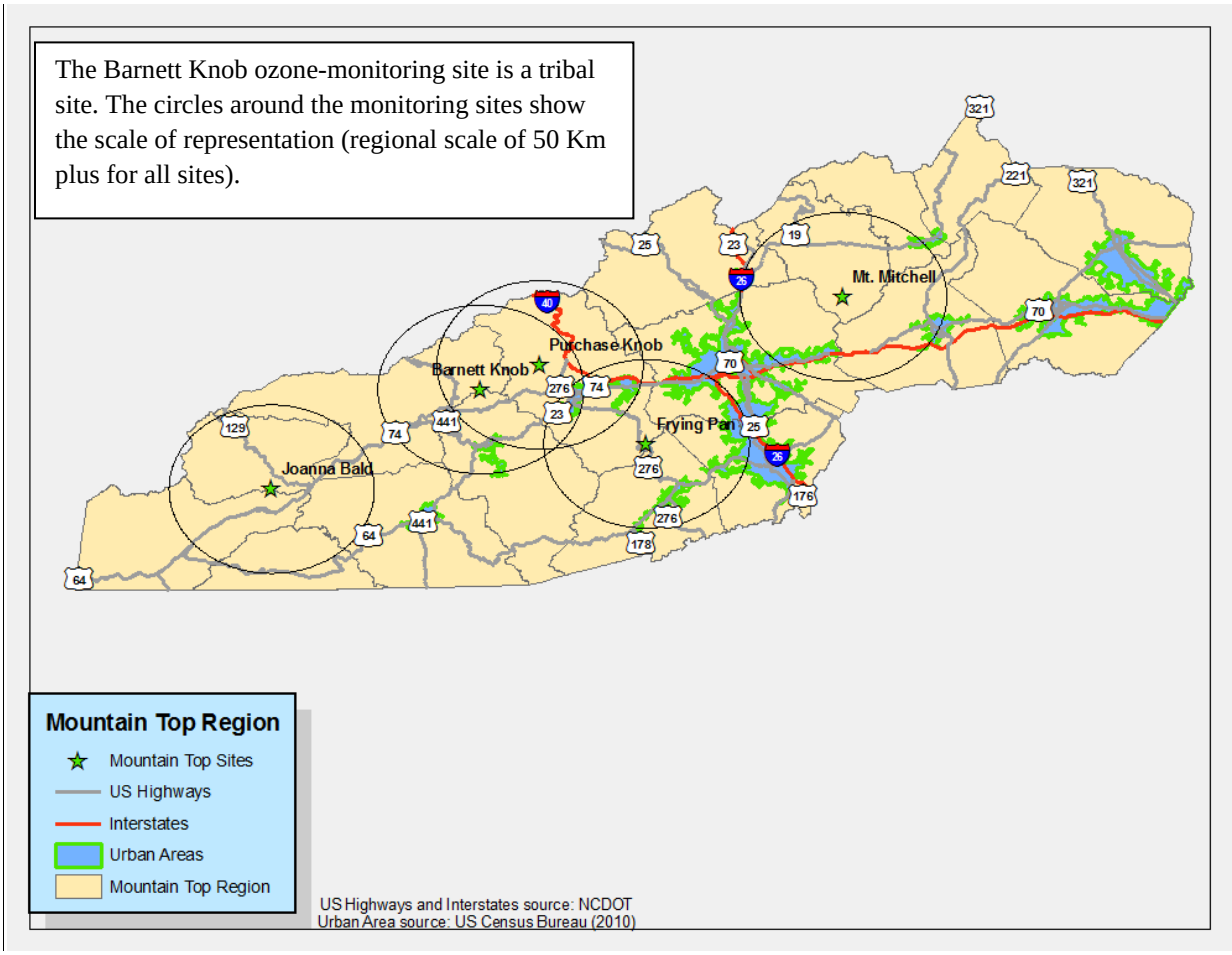

Figure A-2. Location of mountain top monitoring sites

At the **Joanna Bald** site in Graham County, the DAQ operates an ozone monitor that belongs to the United States Department of Agriculture Forest Service. The relative humidity and air temperature sensors that were installed in 2005 were shut down on Oct. 8, 2014. A picture of the site as well as views looking north, east, south and west are provided in Figure A-4 through Figure A-11. Table A1 summarizes monitoring information for the site. This monitoring site is in the Joyce Kilmer-Slickrock Wilderness Area, a class I area. This monitor is a rural monitor. The location of the monitor with regards to the flood plain is shown in Figure A-12.

Figure A-3. Joanna Bald ozone monitoring site

Figure A-4. The Joanna Bald site looking north

Figure A-5. Looking northwest from the Joanna Bald site

Figure A-6. The Joanna Bald site looking west

Figure A-7. Looking southwest from the Joanna Bald site

Figure A-8. Looking northeast from the Joanna Bald site

Figure A-9. The Joanna Bald site looking east

Figure A-10. Looking southeast from the Joanna Bald site

Figure A-11. The Joanna Bald site looking south

Table A1. Site Information Table for Joanna Bald

Site Name:	Joanna Bald			**AQS Site Identification Number:**	37-075-0001
Location:	National Forest Road 423 Spur, Robbinsville, North Carolina				
CBSA:	None			**CBSA #:**	00000
Latitude	35.257930	**Longitude**	-83.795620	**Datum:**	WGS84
Elevation	1429 meters				

Parameter Name	**Method**	**Method Reference ID**	**Sample Duration**	**Sampling Schedule**
Ozone	Instrumental with ultra violet photometry (047)	EQOA-0880-047	1-Hour	April 1 to Oct. 31

Date Monitor Established:	Ozone				April 3, 2003
Nearest Road:	National Forest Road	**Traffic Count:**	< 10	**Year of Count:**	Estimate

Parameter Name	**Distance to Road**	**Direction to Road**	**Monitor Type**	**Statement of Purpose**
Ozone	14,323 meters	Northwest	Special purpose	Real-time AQI reporting and forecasting. Compliance w/NAAQS.

Parameter Name	**Monitoring Objective**	**Scale**	**Suitable for Comparison to NAAQS**	**Proposal to Move or Change**
Ozone	General background	Regional	Yes	None

	Meets Part 58 Requirements for:			
Parameter Name	**Appendix A**	**Appendix C**	**Appendix D**	**Appendix E**
Ozone	Yes	Yes	Yes	Yes

Parameter Name	**Probe Height (m)**	**Distance to Support**	**Distance to Trees**	**Obstacles**
Ozone	4.22 meters	1.7 meters	10.97 meters to northwest	None

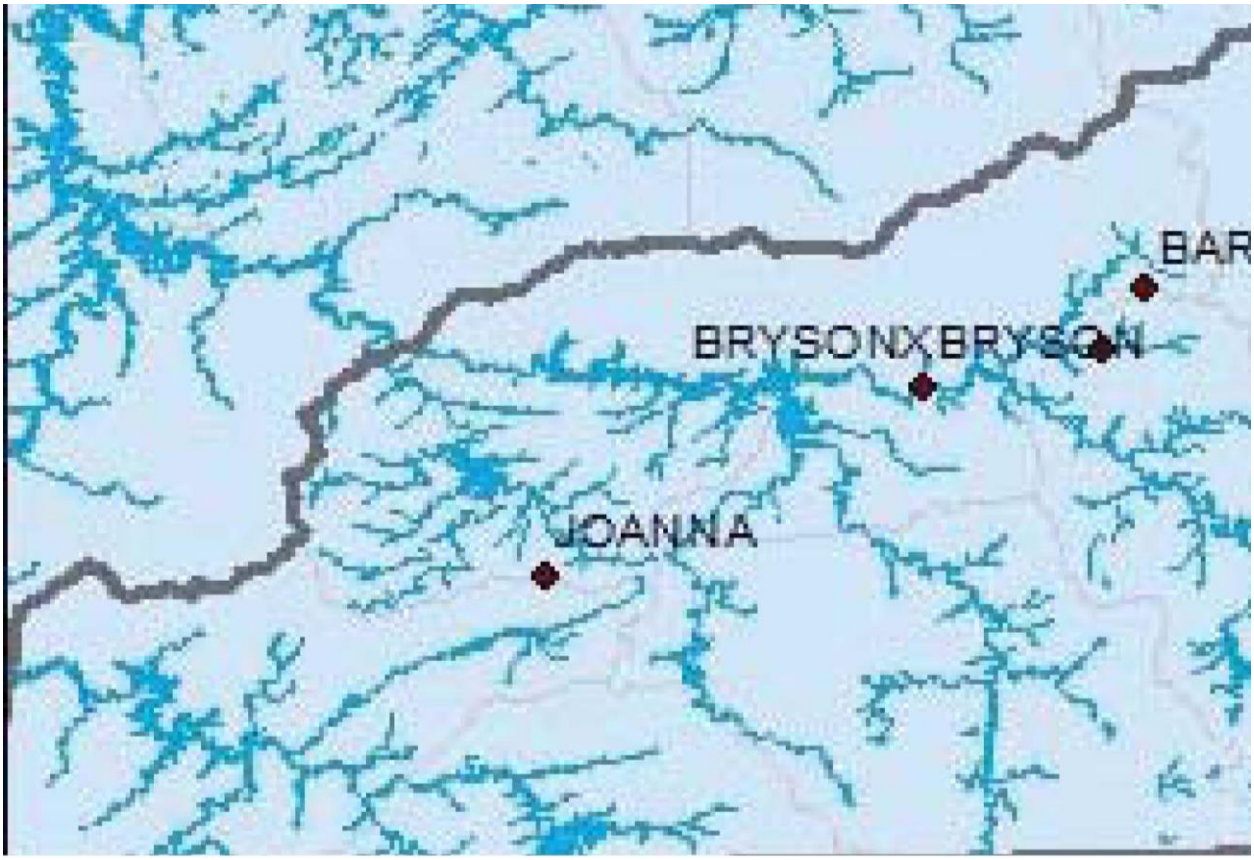

Figure A-12. Location of Joanna Bald relative to the flood plain

At the **Frying Pan Mountain** monitoring site, 37-087-0035, the DAQ operates a seasonal ozone monitor. At the end of the 2011 ozone season, a new monitoring shelter was constructed at the site. A picture of the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest are provided in Figure A-13 through Figure A-21. Table A2 provides information on the site. This site is in a class 1 area (the Shining Rock Wilderness Area) and is collocated with an Interagency Monitoring of Protected Visual Environments (IMPROVE) monitor. This monitor is a rural monitor. The location of the monitor with regards to the flood plain is shown in Figure A-22.

Figure A-13. Frying Pan Mountain ozone and IMPROVE monitoring site, 37-087-0035

Figure A-14. Looking north from the Frying Pan site

Figure A-16. Looking northeast from the Frying Pan site

Figure A-15. Looking northwest from the Frying Pan site

Figure A-17. Looking east from the Frying Pan site

Figure A-18. Looking west from the Frying Pan site

Figure A-20. Looking southeast from the Frying Pan site

Figure A-19. Looking southwest from the Frying Pan site

Figure A-21. Looking south from the Frying Pan site

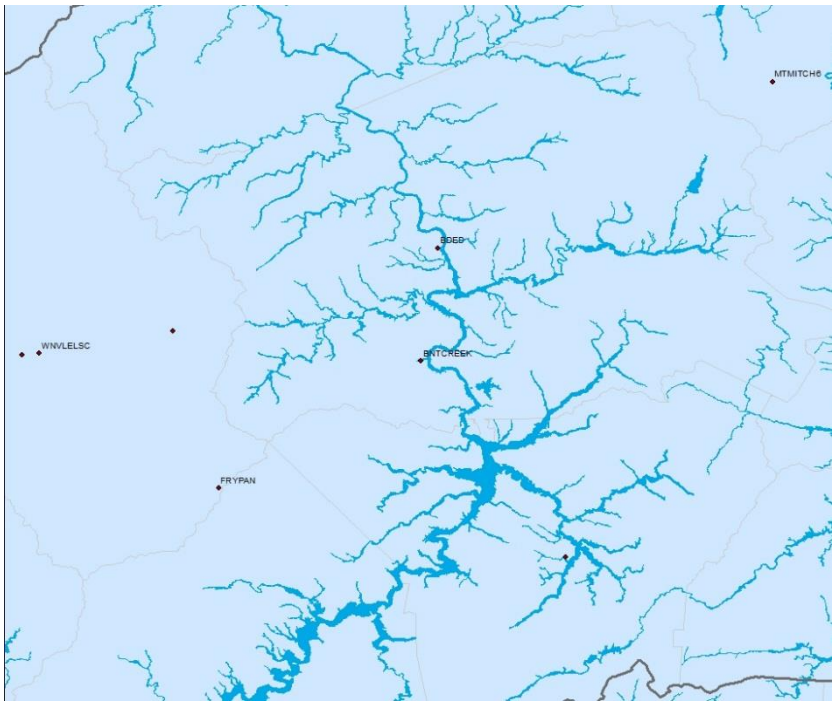

Figure A-22 Asheville area monitors in relation to the flood plain

Table A2. Site Information Table for Frying Pan Mountain

Site Name:	Frying Pan Mountain		**AQS Site Identification Number:**		37-087-0035
Location:	Tower Blue Ridge Pkwy Mile Marker 410, Canton, North Carolina				
CBSA:	None		**CBSA #:**		00000
Latitude	35.393719	**Longitude**	-82.774386	**Datum:**	WGS84
Elevation	1617.88 meters				

Parameter Name	**Method**	**Method Reference ID**	**Sample Duration**	**Sampling Schedule**
Ozone	Instrumental with ultra violet photometry, 047	EQOA-0880-047	1-Hour	April 1 to Oct. 31

Date Monitor Established:	Ozone		May 8, 1990
Nearest Road:	Blue Ridge Parkway	**Traffic Count:** 300	**Year of Count:** Estimated

Parameter Name	**Distance to Road**	**Direction to Road**	**Monitor Type**	**Statement of Purpose**
Ozone	315 meters	Southeast	Special purpose	Compliance w/NAAQS. Real-time AQI reporting & forecasting.

Parameter Name	**Monitoring Objective**	**Scale**	**Suitable for Comparison to NAAQS**	**Proposal to Move or Change**
Ozone	General background	Regional	Yes	None

Parameter Name	**Meets 40 CFR Part 58 Requirements for:**			
	Appendix A	**Appendix C**	**Appendix D**	**Appendix E**
Ozone	Yes	Yes	Yes	Yes

Parameter Name	**Probe Height (m)**	**Distance to Support**	**Distance to Trees**	**Obstacles**
Ozone	4.5	1.1 meter	> 20 meters	None

At the **Purchase Knob** monitoring site, 37-087-0036, the DAQ operates a seasonal ozone monitor. Figure A-23 shows the site. The location of the monitor with regards to the flood plain is shown in Figure A-24. Views looking north, northeast, east, southeast, south, southwest, west and northwest are provided in Figure A-25 through Figure A-32. This site is in a class 1 area (Great Smokey Mountains National Park). This monitor is a rural monitor.

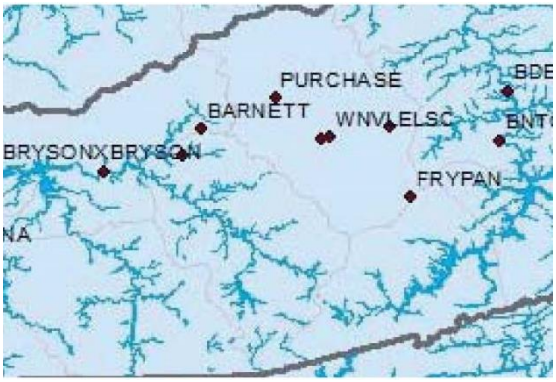

Figure A-24. Location of Purchase Knob relative to the flood plain

Figure A-23. The Purchase Knob seasonal ozone monitoring site

Figure A-25. Looking north from the Purchase Knob site

Figure A-29. Purchase Knob site looking northeast

Figure A-26. Purchase Knob site looking northwest

Figure A-30. Looking east from the Purchase Knob site

Figure A-27. Looking west from the Purchase Knob site

Figure A-31. Looking southeast from the Purchase Knob site

Figure A-28. Purchase Knob site looking southwest

Figure A-32. Looking south from the Purchase Knob site

At **Mount Mitchell,** 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 A-33 through Figure A-40. This site is located at the Mount Mitchell State Park visitor center. The location of the monitor with regards to the flood plain is shown in Figure A-41.

Figure A-33. The Mount Mitchell ozone monitoring site

Figure A-34. Looking north from the Mount Mitchell site

Figure A-35. Mount Mitchell site looking northwest

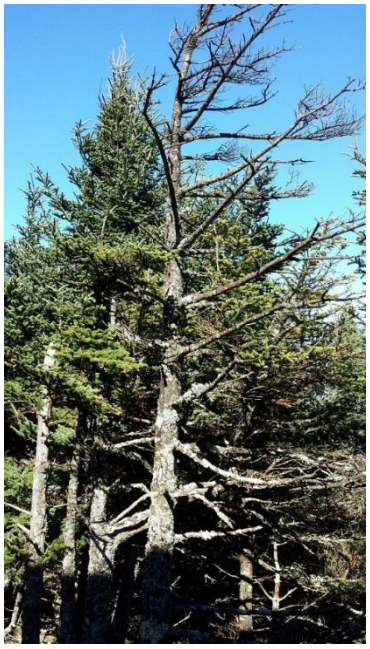

Figure A-36. Mount Mitchell looking northeast

Figure A-37. Looking west from the Mount Mitchell site

Figure A-38. Mount Mitchell looking southwest

Figure A-39. Looking east from the Mount Mitchell site

Figure A-40. Looking south from the Mount Mitchell site

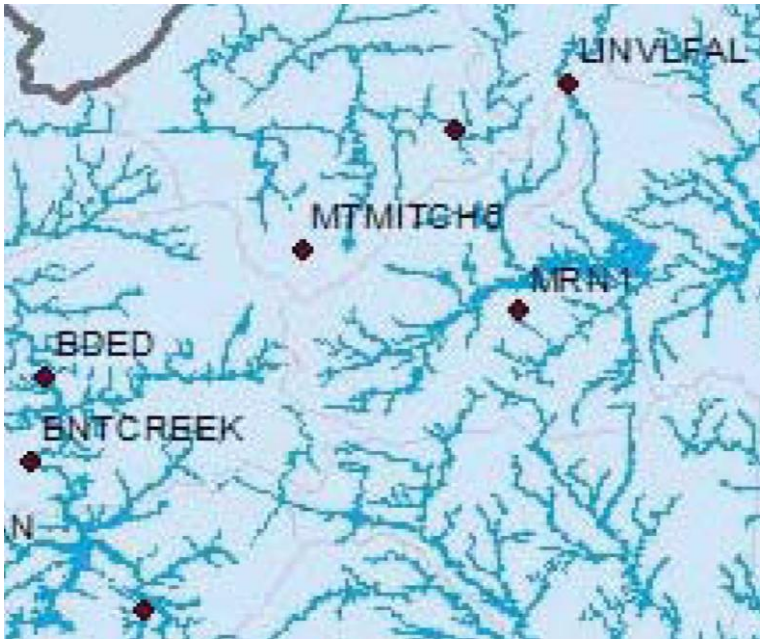

Figure A-41. Location of the Mount Mitchell site relative to the flood plain

There are no new monitoring rules that require additional monitoring in these high-elevation areas. The mountain top seasonal ozone monitors started on March 1, 2017, because the ozone monitoring season was extended to March in 2015. The DAQ requested and received a waiver

for March ozone monitoring for the Joanna Bald, Frying Pan, Purchase Knob and Mount Mitchell sites in years when the weather does not allow access to these sites. Access is often limited during the winter. Sometimes these sites remain inaccessible until early to mid-April. The waiver request approval was granted by the EPA in December 2016.

(2) The Asheville MSA

The Asheville MSA consists of the valley portions (areas under the elevation of 1.2 Km or 4,000 feet) of four counties: Buncombe, Haywood, Henderson and Madison. The major urban areas are Asheville, Waynesville and Hendersonville. The DAQ currently operates two monitoring sites in the Asheville MSA, the Western North Carolina Regional Air Quality Agency, WNC, operates two, both agencies jointly operate an urban air toxics monitoring site and DAQ and Duke Energy Progress jointly operate a sulfur dioxide data requirements rule, DRR, site. These sites are located at the Board of Education, Bent Creek, AB Tech and Skyland in Buncombe County and the Waynesville Elementary School and Canton in Haywood County. In 2013 WNC relocated its ozone monitor at Bent Creek to another location within the park. On Dec. 31, 2015, the DAQ shut down the fine particle monitor at the Waynesville Recreation Center. On Jan. 1, 2017, two new source-oriented monitoring sites began operating in this MSA. One is operated by the DAQ in Canton near the Evergreen facility. The other is operated by Duke in Skyland near the Asheville Steam Station. The locations of these six monitoring sites are shown in Figure A-42.

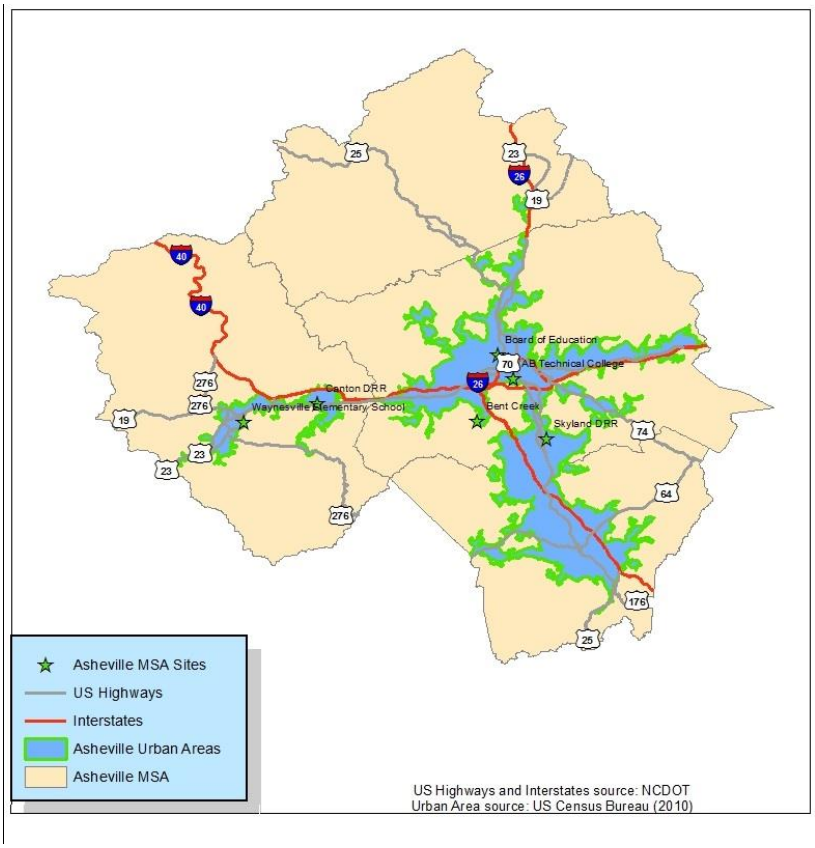

Figure A-42. Locations of Monitoring Sites in the Asheville MSA

At the **Board of Education** site, WNC operates a one-in-three-day fine particle federal reference method, FRM, monitor, a one-in-six-day collocated precision fine particle FRM monitor and a continuous fine particle monitor. The one-in-six-day SASS and URG 3000 speciation fine particle monitors were shut down in January 2015 when the EPA stopped funding them. A picture of the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest are provided in Figure A-43 through Figure A-51. On Jan. 1, 2013, WNC changed from using the well impactor ninety-six, WINS, to very sharp cut cyclones, VSCC, on the FRMs. In 2017 WNC plans to change the method for continuously measuring fine particles.

Figure A-43. WNC Board of Education fine particle monitoring site, 37-021-0024

Figure A-44. Board of Education site looking north

Figure A-45. Board of Education site looking northwest

Figure A-46. Board of Education site looking northeast

Figure A-47. Board of Education site looking east

Figure A-48. Board of Education site looking west

Figure A-50. Board of Education site looking southeast

Figure A-49. Board of Education site looking southwest

Figure A-51. Board of Education site looking south

At the **Bent Creek** site, 37-021-0030, WNC operates a seasonal ozone monitor. A picture of the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest are provided in Figure A-52 through Figure A-60. This site is one of two urban ozone-monitoring sites in the MSA. 40 CFR 58 Appendix D requires the Asheville MSA to have two ozone monitoring sites. Because of the growth of the trees at the old Bent Creek location, WNC moved the site to a new Bent Creek location that is within a mile of the old Bent Creek location on June 6, 2013.

Figure A-52. The Bent Creek ozone monitoring site, 37-021-0030

Figure A-53. Looking north from the Bent Creek site

Figure A-54. Looking northwest from the Bent Creek site

Figure A-55. Looking west from the Bent Creek site

Figure A-56. Looking southwest from the Bent Creek site

Figure A-57. Looking northeast from the Bent Creek site

Figure A-58. Looking east from the Bent Creek site

Figure A-59. Looking southeast from the Bent Creek site

Figure A-60. Looking south from the Bent Creek site

At the **AB Tech** site, 37-021-0035, WNC operates a year-round air toxics volatile organic compound sampler. Samples are collected in stainless steel canisters and sent to the Laboratory Analysis Branch, LAB, where they are analyzed for 68 compounds using the Compendium Method for Toxic Organics 15. A picture of the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest are provided in Figure A-61 through Figure A-69.

Figure A-61. AB Tech urban air toxics monitoring site

Figure A-62. Looking north from the AB Tech site

Figure A-64. Looking northeast from the AB Tech site

Figure A-63. Looking northwest from the AB Tech site

Figure A-65. Looking east from the AB Tech site

Figure A-66. Looking west from the AB Tech site

Figure A-67. Looking southwest from the AB Tech site

Figure A-68. Looking southeast from the AB Tech site

Figure A-69. Looking south from the AB Tech site

In 2015, the North Carolina Division of Air Quality, DAQ, began working with Duke Energy Progress to establish a sulfur dioxide monitoring station in Skyland, North Carolina, to characterize the ambient sulfur dioxide concentrations near the Asheville steam station as required by the DRR for sulfur dioxide.[2] The area chosen for placement of the monitor was selected using the results of modeling done as described in the technical assistance document and is reported in Appendix A-3. Duke Progress Energy Skyland Siting Analysis and Additional Site Information. An aerial view of the monitoring location in Figure A-70.

[2] Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide Primary National Ambient Air Quality Standard, Federal Register of Aug. 21, 2015, (80 FR 51052)(FRL-9928-18-OAR), 2015-20367.

Figure A-70. Aerial view showing the location of the Skyland DRR monitoring station

The Air Quality System identification number for this monitor is 37-021-0036-42401-1. DAQ operates this monitor in collaboration with Duke Energy Progress to ensure the air in the Asheville area complies with the national ambient air quality standards for sulfur dioxide. Duke Energy Progress operates the monitor following the DAQ quality assurance project plan and the monitor is part of the DAQ primary quality assurance organization. Figure A-71 through Figure A-78 show views from the site looking north, east, southeast, south, west and northwest.

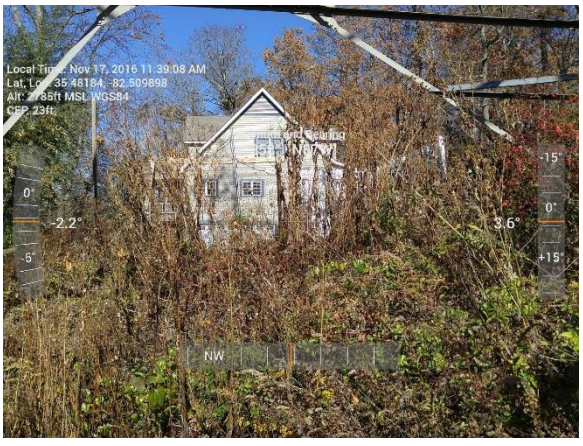

Figure A-71. Looking north from the Skyland DRR site

Figure A-72. Looking northeast from the Skyland DRR site

Figure A-73. Looking northwest from the Skyland DRR site

Figure A-74. Looking west from the Skyland DRR site

Figure A-75. Looking southwest from the Skyland DRR site

Figure A-76. Looking east from the Skyland DRR site

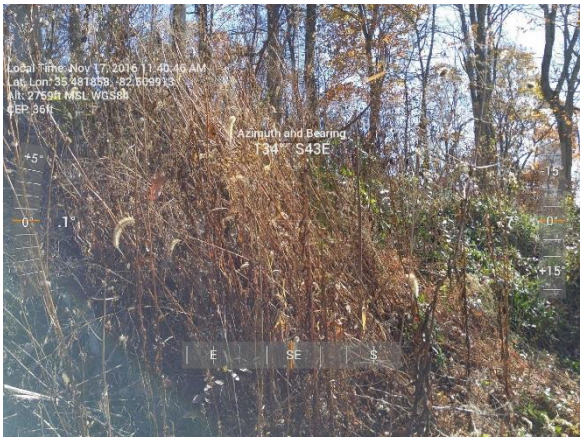

Figure A-77. Looking southeast from the Skyland DRR site

Figure A-78. Looking south from the Skyland DRR site

Figure A-79. The Waynesville elementary school ozone monitoring site

At the **Waynesville Elementary School** site, 37-087-0008, the DAQ operates a seasonal ozone monitor, one of two urban ozone monitoring sites in the MSA. 40 CFR 58 Appendix D requires the Asheville MSA to have two ozone monitoring sites. The site is shown in Figure A-79. Table A3 provides information on the site. This site started at the beginning of the 2011 ozone monitoring season and is across the street from the Haywood County Health Department where the previous site was located.

Table A3. Site Information Table for Waynesville Elementary School

Site Name:	Waynesville Elementary School			**AQS Site Identification Number:**			37-087-0008		
Location:	2236 Asheville Road, Waynesville, North Carolina			**CBSA:**	Asheville, NC		**MSA #:**	11700	
Latitude	35.507160	**Longitude**	-82.963370	**Datum:**	WGS84	**Elevation**	793 meters		
Parameter Name	**Method**				**Method Reference ID**	**Sample Duration**	**Sampling Schedule**		
Ozone	Instrumental with ultra violet photometry (047)				EQOA-0880-047	1-Hour	March 1 to Oct. 31		
Date Monitor Established:	Ozone						April 1, 2011		
Nearest Road:	Asheville Road		**Traffic Count:**	8600		**Year of Count:**	2014		
Parameter Name	**Distance to Road**		**Direction to Road**		**Monitor Type**	**Statement of Purpose**			
Ozone	151 meters		East northeast		SLAMS	Compliance w/NAAQS. Real-time AQI reporting & forecasting.			
Parameter Name	**Monitoring Objective**	**Scale**	**Suitable for Comparison to NAAQS**			**Proposal to Move or Change**			
Ozone	Population exposure	Regional	Yes			None			
Parameter Name	**Meets Part 58 Requirements for:**								
	Appendix A	**Appendix C**	**Appendix D**			**Appendix E**			
Ozone	Yes	Yes	Yes			Yes			
Parameter Name	**Probe Height (m)**	**Distance to Support**	**Distance to Trees**			**Obstacles**			
Ozone	3.8	1.02 meters	>20 meters			None			

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The site was relocated on April 1, 2011, to Junaluska Elementary School at 2238 Asheville Road, Waynesville, NC 28786, approximately 200 meters east of the previous Waynesville health department site. An aerial view of the area is shown in Figure A-80. Figure A-81, Figure A-83, Figure A-84 and Figure A-82 provide views looking north, east, south and west from the new site.

Figure A-80. Aerial view of the Waynesville ozone monitoring site (A is the old site location)

Figure A-81. Looking north from Waynesville ozone site

Figure A-82. Waynesville ozone site looking east

Figure A-83. Waynesville ozone site looking west

Figure A-84. Waynesville ozone site looking south

At the **Canton DRR** site, 37-087-0013, DAQ operates 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 ambient air in the proximity of the Evergreen/Blue Ridge Paper facility meets the national ambient air quality standards. DAQ operates this monitor to ensure the air in the Asheville area complies with the national ambient air quality standards for sulfur dioxide. Figure A-85 through Figure A-94 show an aerial view of the site in relationship to the Evergreen facility, the site and views from the site looking north, northeast, east, southeast, south, southwest, west and northwest.

Figure A-85. Aerial view showing the location of the Canton DRR monitoring station

Figure A-86. Canton DRR sulfur dioxide monitoring site

Figure A-87. Looking north from the Canton DRR site

FigureA- 91. Looking northeast from the Canton DRR site

Figure A-88. Looking northwest from the Canton DRR site

Figure A-92. Looking east from Canton DRR site

Figure A-89. Looking west from the Canton DRR site

Figure A-93. Looking southeast from the Canton DRR site

Figure A-90. Looking southwest from the Canton DRR site

Figure A-94. Looking south from the Canton DRR site

The December 2010 changes to the **lead monitoring** regulations[3] impacted the Asheville MSA because Evergreen/Blue Ridge Paper Products, located in Haywood County, emitted over 0.5 tons of lead to the air in 2009 and 2010.[4] In 2011, the DAQ requested and received a waiver for lead monitoring at Blue Ridge Paper based on results of modeling.[5] Model results indicate the maximum ambient lead concentration in the ambient air at and beyond the fence line is 0.006 micrograms per cubic meter, well below the 0.075 micrograms per cubic meter (50 percent of the NAAQS) threshold for monitoring. The DAQ did not renew the waiver in 2015 because the facility currently emits less than 0.5 tons of lead. [6]

The 2015 sulfur dioxide monitoring requirements required additional sulfur dioxide monitoring in this MSA.[7] The sulfur dioxide monitors required by this rule are discussed in detail in Appendix A-3. Duke Progress Energy Skyland Siting Analysis and Additional Site Information and Appendix A-4. Evergreen Packaging Canton Siting Analysis and Additional Site Information. Both sites started in January 2017.

(3) The Non-MSA Valley Areas

The non-MSA valley areas consist of those areas below 1.2 Km (4,000 feet) in 13 counties: Avery, Cherokee, Clay, Graham, Jackson, Macon, McDowell, Mitchell, Polk, Rutherford, Swain, Transylvania and Yancey. There are no major metropolitan areas. The Brevard micropolitan statistical area is in Transylvania County and the Forest City micropolitan statistical area is in Rutherford County. The DAQ currently operates three monitoring sites in this area and the EBCI operates two monitoring sites. The EBCI operates a fine-particle monitoring site in Cherokee, North Carolina and an ozone-monitoring site in Swain County at the old high school. Both sites are tribal monitors and not part of the DAQ monitoring network. This section focuses on the three monitoring sites operated by DAQ. These sites are located at Bryson City in Swain County, Linville Falls in Avery County and Spruce Pine in Mitchell County. The locations of these five monitoring sites are shown in Figure A-95. The Marion particle monitoring station in McDowell County was shut down on Dec. 31, 2015.

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[3] 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.

[4] **North Carolina Criteria and Toxic Air Pollutant Point Source Emissions Report, a**vailable on the worldwide web at https://xapps.ncdenr.org/aq/ToxicsReport/ToxicsReportFacility.jsp?ibeam=true&year=2009&pollutant=153&county_code=087.

[5] 2011 State of North Carolina Ambient Air Monitoring Network Plan, The U. S. EPA Region 4 Comments and Recommendations, p3-4, available at http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=7843.

[6] 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=2015&pollutant=153&county_code=087, accessed on May 12, 2017

[7] Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide Primary National Ambient Air Quality Standard, Federal Register of Aug. 21, 2015, (80 FR 51052) (FRL-9928-18-OAR), 2015-20367.

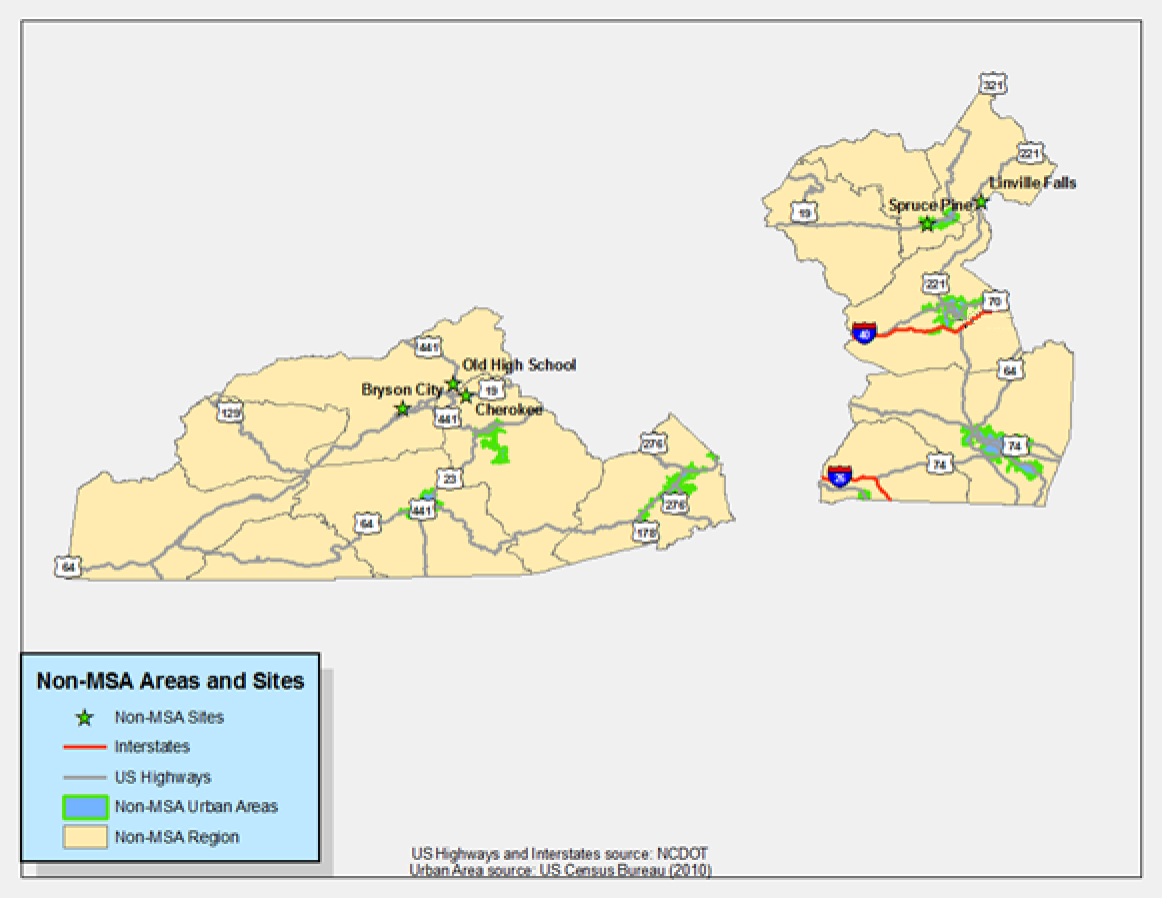

Figure A-95. Monitoring sites in the non-MSA valley areas of the Asheville monitoring region

At **Bryson City** in Swain County, 37-173-0002, DAQ operates a seasonal ozone monitor and a federal equivalent method, FEM, beta attenuation, BAM, continuous fine particle monitor. In April 2014, the Tennessee Valley Authority added a hydrologic gauging station. A 12-month special purpose sulfur dioxide monitor collected background data for modeling attainment demonstrations for the Asheville power plant from August 2014 to August 2015. Figure A-96 through Figure A-104 shows the site and views looking north, northeast, east, southeast, south, southwest, west and northwest. The site is collocated with a meteorological tower measuring wind speed, wind direction, two-meter and 10-meter ambient temperature, relative humidity, ultraviolet radiation and rain fall.

Figure A-96. The Bryson City ozone, particle and meteorological monitoring station, 37-173-0002

Figure A-97. Looking north from the Bryson site

Figure A-101. The Bryson site looking northeast

Figure A-98. The Bryson site looking northwest

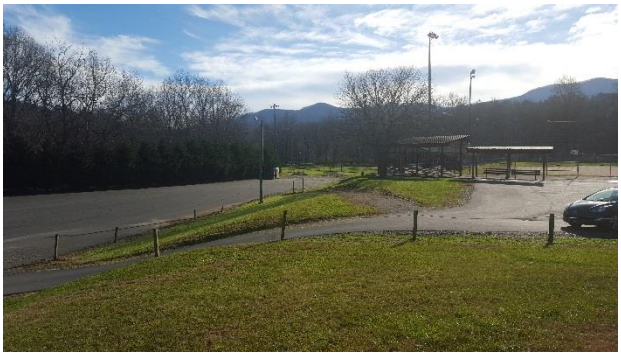

Figure A-102. Looking east from the Bryson site

Figure A-99. Looking west from the Bryson site

Figure A-103. The Bryson site looking southeast

Figure A-100. The Bryson site looking southwest

Figure A-104. Looking south from the Bryson site

Table A4 summarizes monitoring information for the Bryson City site.

Table A4. Site Information Table for Bryson City

Site Name:	Bryson City			**AQS Site Identification Number**	37-173-0002
Location:	30 Recreation Park Drive, Bryson City, North Carolina				
CBSA:	Not in a CBSA			**CBSA #:**	00000
Latitude	35.434767	**Longitude**	-83.442133	**Datum:**	WGS84
Elevation	560 meters				

Parameter Name	**Method**	**Method Reference ID**	**Sample Duration**	**Sampling Schedule**
Ozone	Instrumental with ultra violet photometry (047)	EQOA-0880-047	1-Hour	March 1 to Oct. 31
PM 2.5 local conditions	Met One BAM-1020 Mass Monitor w/VSCC - beta attenuation	EQPM-0308-170	1-Hour	Year round
Outdoor temperature & temperature difference	Instrumental - electronic or machine avg. (041)	Not a reference method	1-Hour	Year round
Rain/melt precipitation	Bucket - continuous or incremental	Not a reference method	1-Hour	Year round
Relative humidity	Instrumental - hygrothermograph elec or mach avg (011)	Not a reference method	1-Hour	Year round
Solar radiation	Instrumental – pyranometer (011)	Not a reference method	1-Hour	Year round
Wind direction/speed	Instrumental - electronic or machine avg. (050)	Not a reference method	1-Hour	Year round

Date Monitor Established:	Ozone	April 1, 1995
	PM 2.5 local conditions	June 17, 2009
	Outdoor temperature & temperature difference	April 25, 2001
	Rain/melt precipitation	April 25, 2001
	Relative humidity	April 25, 2001
	Solar radiation	April 25, 2001
	Wind direction/speed	April 25, 2001

Nearest Road:	Recreation Park Drive	**Traffic Count:**	100	**Year of Count:**	2010

Parameter Name	**Distance to Road**	**Direction to Road**	**Monitor Type**	**Statement of Purpose**
Ozone	20 meters	Northwest	SLAMS	Compliance w/NAAQS. Real-time AQI reporting & forecasting.
PM 2.5 local conditions	25 meters	Northeast	SLAMS	Compliance w/NAAQS. Real-time AQI reporting & forecasting.
Outdoor temperature & temperature difference	25 meters	Northeast	Non-regulatory	Real-time information & modeling
Rain/melt precipitation	25 meters	Northeast	Non-regulatory	Real-time information & modeling
Relative humidity	25 meters	Northeast	Non-regulatory	Real-time information & modeling
Solar radiation	25 meters	Northeast	Non-regulatory	Real-time information & modeling
Wind direction/speed	25 meters	Northeast	Non-regulatory	Real-time information & modeling

Parameter Name	**Monitoring Objective**	**Scale**	**Suitable for NAAQS Comparison**	**Proposal to Move or Change**
Ozone	General background	Neighborhood	Yes	None
PM 2.5 local conditions	Regional transport	Regional	Yes	None
Outdoor temperature & temperature difference	Not applicable	Not applicable	Not applicable	None
Rain/melt precipitation	Not applicable	Not applicable	Not applicable	None
Relative humidity	Not applicable	Not applicable	Not applicable	None
Solar radiation	Not applicable	Not applicable	Not applicable	None
Wind direction/speed	Not applicable	Not applicable	Not applicable	None

Table A4. Site Information Table for Bryson City

Parameter Name	Meets Part 58 Requirements for:			
	Appendix A	**Appendix C**	**Appendix D**	**Appendix E**
Ozone	Yes	Yes	Yes	Yes
PM 2.5 local conditions	Yes	Yes	Yes	Yes
Outdoor temperature & temperature difference	Not applicable	Not applicable	Not applicable	Not applicable
Rain/melt precipitation	Not applicable	Not applicable	Not applicable	Not applicable
Relative humidity	Not applicable	Not applicable	Not applicable	Not applicable
Solar radiation	Not applicable	Not applicable	Not applicable	Not applicable
Wind direction/speed	Not applicable	Not applicable	Not applicable	Not applicable

Parameter Name	**Probe Height (m)**	**Distance to Support**	**Distance to Trees**	**Obstacles**
Ozone	4.57	1.82 meters	15.54 meters southwest	None
PM 2.5 local conditions	2.286	2.0574 meters	10.97 meters	None
Outdoor temperature & temperature difference	2 & 10	> 1 meters	>20 meters	None
Rain/melt precipitation	Ground level	Not applicable	>20 meters	None
Relative humidity	2	> 1 meters	>20 meters	None
Solar radiation	2	> 1 meters	>20 meters	None
Wind direction/speed	10	> 1 meters	>20 meters	None

At the **Linville Falls** site, the DAQ operates a seasonal ozone monitor. A picture of the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest are provided in Figure A-105 through Figure A-113. This monitoring site is in the Linville Gorge Wilderness Area class 1 area and is collocated with an IMPROVE monitor. This monitor is a rural monitor. The collocated relative humidity and ambient temperature sensor was shut down on Oct. 30, 2014.

Figure A-105. Linville Falls ozone and IMPROVE monitoring site

Figure A-106. Looking north from the Linville site

Figure A-107. The Linville site looking northwest

Figure A-108. Looking west from the Linville site

Figure A-111. Looking east from the Linville site

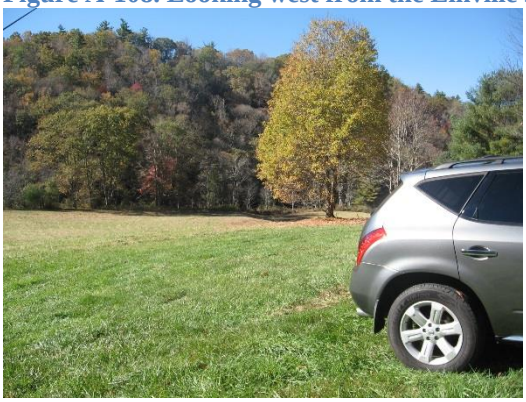

Figure A-109. The Linville site looking southwest

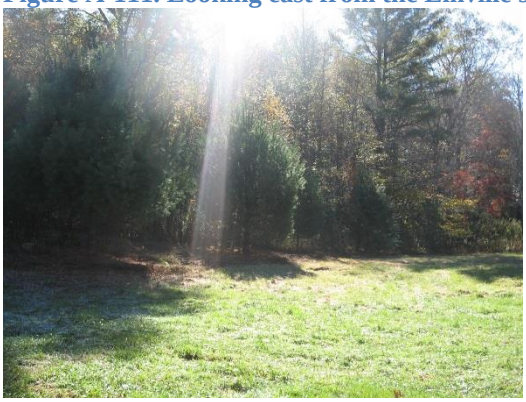

Figure A-112. The Linville site looking southeast

Figure A-110. The Linville site looking northeast

Figure A-113. Looking south from the Linville site

Table A5. Site Information Table for Linville Falls

Site Name:	Linville Falls			**AQS Site Identification Number:**	37-011-0002
Location:	100 Linville Falls Road, Linville Falls				
CBSA:	None			**CBSA #:**	00000
Latitude	35.972347	**Longitude**	-81.933072	**Datum:**	WGS84
Elevation	987 meters				

Parameter Name	**Method**	**Method Reference ID**	**Sample Duration**	**Sampling Schedule**
Ozone	Instrumental with ultra violet photometry (047)	EQOA-0880-047	1-Hour	March 1 to Oct. 31

Date Monitor Established:	Ozone				Aug. 1, 1999
Nearest Road:	Linville Falls Road	**Traffic Count:**	< 10	**Year of Count:**	Estimate

Parameter Name	**Distance to Road**	**Direction to Road**	**Monitor Type**	**Statement of Purpose**

Table A5. Site Information Table for Linville Falls

Ozone	86 meters	East	SLAMS	Compliance w/NAAQS. Real-time AQI reporting and forecasting.

Parameter Name	Monitoring Objective	Scale	Suitable for Comparison to NAAQS	Proposal to Move or Change
Ozone	General background	Urban	Yes	None

	Meets Part 58 Requirements for:			
Parameter Name	**Appendix A**	**Appendix C**	**Appendix D**	**Appendix E**
Ozone	Yes	Yes	Yes	Yes

Parameter Name	Probe Height (m)	Distance to Support	Distance to Trees	Obstacles
Ozone	3.66 meters	1.295 meters	> 20 meters	None

In the fall of 2013, DAQ was evicted from the monitoring site located in Spruce Pine on the top of town hall, 37-121-0001. Figure A-114 provides the eviction notice from the Town of Spruce Pine. The Town of Spruce Pine purchased a building and relocated their offices at the end of 2013. Thus, DAQ shut down the Spruce Pine site at the end of 2013 and established a new site at the Blue Ridge Regional Hospital, 37-121-0004. Because of the timing of the notice, DAQ was unable to include this network modification in the July 2013 network monitoring plan. Thus, the DAQ requested emergency approval from the EPA Region IV for shutting down the old site and establishing the new site. Details on the new site are provided below.

Spruce Pine is in the mountains where there are very few flat open spaces to locate a monitor. The DAQ prefers to keep the monitors on the ground for safety reasons and for ease of access. After searching around Spruce Pine within a mile of the city hall location, a new location at Blue Ridge Regional Hospital, 272 Hospital Dr., Spruce Pine, NC, was identified. As shown in Figure A-115, the hospital location is approximately 1 kilometer east southeast of the city hall site. It is approximately 75 meters southeast of Highway U.S. 19 East, which had an average annual daily traffic count of 9,500 in 2012. Based on Figure E-1 in 40 CFR 58 Appendix E, the monitor is on the edge of the neighborhood-urban scale boundary. The site is located at latitude 35.912487 and longitude -82.062082. A picture of the site and pictures taken from the site looking in 8 compass directions are provided in Figure A-116 through Figure A-124.

Town of Spruce Pine, North Carolina

Paul
Steve
FYI

RECEIVED
SEP 23 2013
DIVISION OF AIR QUALITY
ASHEVILLE REGIONAL OFFICE

September 19, 2013

Mr. Steve D. Ensley
Division of Air Quality, NCDENR
2090 US Highway 70
Swannanoa, NC 28778

Dear Mr. Ensley:

Air Quality Equipment Atop the Spruce Pine Town Hall

As you may be aware, the Town of Spruce Pine has purchased a building and plans to relocate our town hall. If all goes as anticipated, the closing on the property will be on September 27, 2013. We hope to have our offices moved by the end of the current calendar year.

No decision has been made as to the use or disposition of the existing building. I wanted to give you ample time to make your decisions regarding the location of the air quality equipment currently located on top of our building. Please feel free to contact me with questions or comments.

Sincerely,

Richard Canipe

Richard Canipe
Manager, Town of Spruce Pine

cc: Terri Davis, NCDENR Division of Air Quality

Post Office Box 189, Spruce Pine, North Carolina 28777-0189
Telephone: (828) 765-3000 Fax: (828) 765-3014 Website: www.sprucepine-nc.gov

Figure A-114. Eviction notice from the Town of Spruce Pine

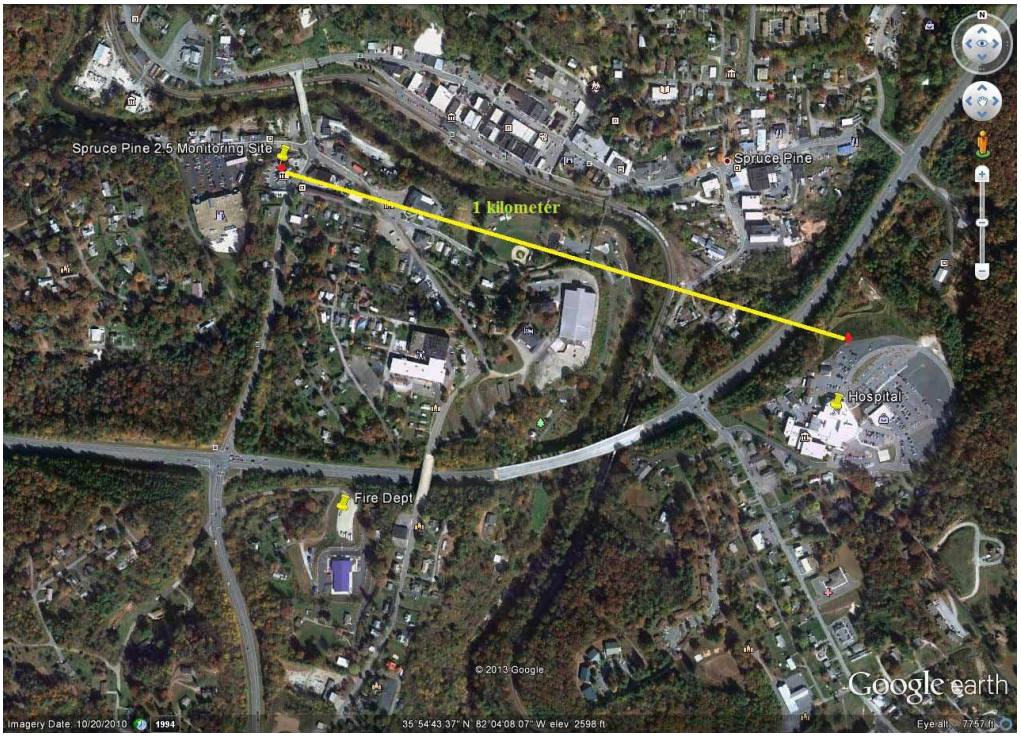

Figure A-115. Arial view of city hall and hospital monitoring sites

Figure A-116. Spruce Pine hospital, 37-121-0004, fine particle monitoring site

Figure A-117. Spruce Pine hospital site looking north

Figure A-118. Spruce Pine hospital site looking northwest

Figure A-119. Spruce Pine hospital site looking west

Figure A-120. Spruce Pine hospital site looking northeast

Figure A-121. Spruce Pine hospital site looking east

Figure A-122. Spruce Pine hospital site looking southeast

Figure A-123. Spruce Pine hospital site looking southwest

Figure A-124. Spruce Pine hospital site looking south

The hospital has a boiler house and emergency generators but the monitor is at least 200 meters northeast from them. The trees to the northeast are about 32 meters high and 80 meters from the site. The trees to the east are about 33 meters high and 86 meters away. The trees to the southeast are 60 meters tall and 140 meters away. The building to the southwest is about 11 meters high and 130 meters from the site. The trees to the west are about 38 meters tall and 90 meters away. All the trees and buildings are far enough away as to not be obstacles to the flow of the air. In 2015 the hospital expanded the parking lot. The monitor was moved 9 meters to the north on March 31, 2015.

There are no new monitoring rules that require additional monitoring in these non-MSA valley areas.

Appendix A.1 Annual Network Site Review Forms for 2016

Joanna Bald in Joyce Kilmer-Slickrock Wilderness Area

Frying Pan in the Shining Rock Wilderness Area

Purchase Knob in the Great Smoky Mountains National Park

Mount Mitchell in the Mount Mitchell State Park

Bent Creek in Asheville, operated by the WNCRAQA

Board of Education in Asheville, operated by the WNCRAQA

AB Tech Air Toxics Site, operated by WNCRAQA & the Laboratory Analysis Branch

Waynesville Health Center in Waynesville

Canton DRR in Canton

Bryson City

Linville Falls in the Linville Gorge Wilderness Area

Spruce Pine

Site Review Form Calendar Year 2016

Site Information

Region ARO	**Site Name** JOANNA	**AQS Site # 37-075-0001**
Street Address-National Forest Road 423 Spur		**City Robbinsville**
Urban Area Not in an Urban Area	**Core-based Statistical Area** None	
Enter Exact		
Longitude -83.7955	**Latitude** 35.2578	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	___ **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		**1436.00**

Name of nearest road to inlet probe National Forest Road ADT _____ Year _____ ____

Distance of ozone probe to nearest traffic lane (m) _____ Direction from ozone probe to nearest traffic lane ___

Comments: No count available. Estimate less than 10 cars per day

Name of nearest major road Snow Bird Road (#1115) ADT 930 Year 2013

Distance of site to nearest major road (m) 6200.00 Direction from site to nearest major road NW

Comments: Used google earth for distance

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) 4.22

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) 1.7

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) 10.97 Direction from probe to tree NW *Height of tree (m) 9.30

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 2016

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 12, 2016 New Pictures Submitted? Yes ☐ No ☒

Reviewer Terri Davis Date: December 13, 2016

Ambient Monitoring Coordinator Steve Ensley Date: January 19, 2017

Instructions:

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

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

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

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

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

Site Review Form Calendar Year 2016

Site Information

Region ARO	**Site Name** FRYPAN	**AQS Site # 37-2087-0035**
Street Address-750 Frying Pan Road		**City Canton**
Urban Area Not in an Urban Area	**Core-based Statistical Area** None	
Enter Exact		
Longitude -82.7742	**Latitude** 35.3937	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	___ **Explanation: Google earth**
Elevation Above/below Mean Sea Level (in meters)		**1617.88**

Name of nearest road to inlet probe Blue Ridge Parkway ADT 300 Year estimated ____

Distance of ozone probe to nearest traffic lane (m) 315 Direction from ozone probe to nearest traffic lane SE

Comments: _____

Name of nearest major road Blue Ridge Parkway ADT 300 Year 2014

Distance of site to nearest major road (m) 315.00 Direction from site to nearest major road SE

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) 4.50

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) 1.1

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) _____ 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 ☐

Site Review Form Calendar Year 2016

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: March 13, 2015 New Pictures Submitted? Yes ☐ No ☒

Reviewer Terri Davis Date: December 13, 2016

Ambient Monitoring Coordinator Steve Ensley Date: 1/19/17

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.

Site Review Form Calendar Year 2016

Site Information

Region ARO	**Site Name** Purchase Knob	**AQS Site # 37-087-0036**
Street Address-6905 Purchase Road		**City Waynesville**
Urban Area Not in an Urban Area	**Core-based Statistical Area** None	
Enter Exact		
Longitude -83.0741	**Latitude** 35.5871	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Other (explain)** **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		1504.49

Name of nearest road to inlet probe Purchase Road ADT 20 Year estimated ____

Distance of ozone probe to nearest traffic lane (m) 103 Direction from ozone probe to nearest traffic lane SE

Comments: _____

Name of nearest major road US-276 Jonathan Creek Road ADT 8100 Year 2015

Distance of site to nearest major road (m) 5418.00 Direction from site to nearest major road ESE

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) 3.81

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) 1.07

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) 16.40 Direction from probe to tree WNW *Height of tree (m) 2.49

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

*Identify obstacle Tree 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 2016

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: 2/4/15 New Pictures Submitted? Yes ☒ No ☐

Reviewer Steve Ensley Date: October 21, 2016

Ambient Monitoring Coordinator Steve Ensley Date: October 21, 2016

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.

Site Review Form Calendar Year 2016

Site Information

Region ARO	**Site Name** Mt. Mitchell	**AQS Site # 37-199-0004**
Street Address-2388 State Hwy 128		**City Burnsville**
Urban Area Not in an Urban Area	**Core-based Statistical Area** None	
Enter Exact		
Longitude -82.2649	**Latitude** 35.765453	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	___ **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		2022.00

Name of nearest road to inlet probe State Hwy 128 ADT 670 Year latest available 2014

Distance of ozone probe to nearest traffic lane (m) 151 Direction from ozone probe to nearest traffic lane W

Comments: _____

Name of nearest major road State Hwy 128 ADT 670 Year 2014

Distance of site to nearest major road (m) 151.00 Direction from site to nearest major road W

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) see comments

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) see comments

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) _____ 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 ☐

Site Review Form Calendar Year 2016

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: Unable to measure probe distance due to height from ground. Probe measurements taken from prior site review when site was installed and measrured. Probe is actually within 20m of tree dripline but probe height is higher than the trees so it is recorded as not being within 20m of tree dripline.

Date of Last Site Pictures: November 6, 2014 New Pictures Submitted? Yes ☐ No ☒

Reviewer Bob Graves Date: October 17, 2016

Ambient Monitoring Coordinator Steve Ensley Date: January 19, 2017

Instructions:

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

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

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

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

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

Site Review Form Calendar Year 2016

Site Information

Region WNC	**Site Name** Bent Creek	**AQS Site # 37-021-0030**
Street Address 125 Idlwood Drive		**City**
Urban Area ASHEVILLE	**Core-based Statistical Area** Asheville, NC	
Enter Exact		
Longitude -82.6133	**Latitude** 35.5083	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	___ **Explanation:** ____
Elevation Above/below Mean Sea Level (in meters)		____

Name of nearest road to inlet probe ____ ADT 880 Year latest available ____

Distance of ozone probe to nearest traffic lane (m) 337 Direction from ozone probe to nearest traffic lane NE

Comments: ____

Name of nearest major road Brevard Road (Hwy. 191) ADT 12000 Year 2012

Distance of site to nearest major road (m) 1157.64 Direction from site to nearest major road NE

Comments: ____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) 5371 Direction to RR NE ☐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.

0

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) 5.00

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) 2.00

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) ____ 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 ☐

Site Review Form Calendar Year 2016

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: 2016 New Pictures Submitted? Yes ☐ No ☒

Reviewer _____ Date: _____

Ambient Monitoring Coordinator Kevin Lance Date: May 3, 2017

Instructions:

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

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

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

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

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

Site Review Form Calendar Year 2016

Site Information

Region WNC	**Site Name** Board of Education		**AQS Site # 37-021-0034**
Street Address-175 Bingham Road			**City Asheville, NC**
Urban Area ASHEVILLE		**Core-based Statistical Area**	Asheville, NC
Enter Exact			
Longitude -82.5844	**Latitude** 35.6062		**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	___	**Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)			**662.94**

Name of nearest road to inlet probe Bingham ADT Choose an Item2200 Year 2012

Distance of ozone probe to nearest traffic lane (m) _____ Direction from inlet to nearest traffic lane ___

Comments: _____

Name of nearest major road Bingham ADT 2200 Year Choose an item 2012

Distance of site to nearest major road (m) 130.56 Direction from site to nearest major road W

Comments: _____

Site located near electrical substation/high voltage power lines?		Yes ☐ No ☒
Distance of site to nearest railroad track	(m) 208 Direction to RR E	☐NA
OPTIONAL Distance of site to nearest power pole w/transformer	(m) 138	Direction W
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.

_____

Instructions:

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

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

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

Longitude and Latitude: The longitude and latitude should be entered in decimal degrees. Use a conversion program, such as http://transition.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html, to convert to decimal degrees.

Road Information: For the nearest road to the inlet probe, list whatever roadway that carries vehicles that is closest to the probe, whether or not it is a named or public road and even if the road has very little traffic. Use the comments space if necessary to describe the road or the source of the annual average daily traffic (AADT) counts. If the monitor is located near an unnamed, little used, private road, use the nearest major road space to list the closest named public road to the site. Include the distance and direction of the nearest major road from the site as well as the AADT if it is available. If the closest road is a small public road but there is a large major roadway such as an interstate highway, divided highway, major thoroughfare, etc., near the monitoring station use the nearest major road space to list the information about this major roadway. Include the distance and direction of the major road from the site as well as the AADT. The AADT for state roads can be obtained from the North Carolina Division of Transportation at http://www.ncdot.gov/travel/statemapping/trafficvolumemaps/default.html. For AADT values for local roadways contact the appropriate local governments.

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

Site Review Form Calendar Year 2016

Parameters	Monitoring Objective	Scale	Monitor Type
Air flow < 200 L/min ☒ PM2.5 FRM ☐ PM10 FRM ☐ PM10 Cont. (BAM) ☐ PM10-2.5 FRM ☐ PM10-2.5 BAM ☐ PM10 Lead (PB) ☒ PM2.5 Cont. (BAM) ☐ PM2.5 Spec. (SASS) ☐ PM2.5 Spec. (URG) ☐ PM2.5 Cont. Spec.	☐ General/Background_____ ☐ Highest Concentration_____ ☒ Population Exposure_____ ☐ Source Oriented_____ ☐ Transport_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☒ Neighborhood_____ ☐ Urban_____ ☐ Regional_____	☒ SLAMS _____ ☐ SPM_____ ☐ Nonregulatory_____ ☐ Supplemental Speciation _____

Probe inlet height (from ground) ☐ < 2 m _____ ☐ 2-7m _____ ☒ 7-15 m _____ ☐ > 15 m_____
Actual measured distance from probe inlet to ground (meters) 8

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

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 ☐
Distance (Y) between outer edge of all low volume monitor inlets and any Hi-Volume PM-10 or TSP inlet = 2 m or greater?	Yes ☐ No ☐ NA ☒

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, FRM & TEOM, BAM & TEOM) 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): 3
*Are collocated PM2.5 sampler inlets within 1 m vertically of each other?	Yes ☒ No ☐ Give actual (meters): 1

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 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 ☐
*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 ☐

Site Review Form Calendar Year 2016

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: 2015 New Pictures Submitted? Yes ☐ No ☒

Reviewer _____ Date: May 3, 2017

Ambient Monitoring Coordinator Kevin Lance Date: May 3, 2017

Instructions (continued):

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 2016

Site Information

Region WNC	**Site Name** AB Tech	**AQS Site # 37-021-0035**
Street Address-AB Technical Community College		**City** Asheville
Urban Area ASHEVILLE	**Core-based Statistical Area** Asheville, NC	
Enter Exact		
Longitude -82.58611	**Latitude** 35.572222	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	___ **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		647.39

Name of nearest road to inlet probe Victoria Road ADT 2200 Year Choose an item 2010

Comments: Cul-de-sac 73 m from probe

Distance of site to nearest major road (m) 359.00 Direction from site to nearest major road E

Name of nearest major road Victoria Road ADT 2200 Year 2010

Comments: _____

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

Distance of site to nearest railroad track (m) 341 Direction to RR WSW ☐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/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) _____

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) 1.00

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 ☐

*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 tree Distance from probe inlet (m) 30 Direction from probe inlet to obstacle ENE

*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) 359 Direction from probe to nearest traffic lane E

Site Review Form Calendar Year 2016

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 ☐ PM10 Lead (PB) ☐ PM2.5 Cont. (BAM) ☐ PM2.5 Spec. (SASS) ☐ PM2.5 Spec. (URG) ☐ PM2.5 Cont. Spec.	☐ General/Background _____ ☐ Highest Concentration _____ ☐ Population Exposure _____ ☐ Source Oriented _____ ☐ Transport _____ ☐ Welfare Related Impacts _____	☐ Micro _____ ☐ Middle _____ ☐ Neighborhood _____ ☐ Urban _____ ☐ Regional _____	☐ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE _____ ☐ SUPPLEMENTAL SPECIATION_____ **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) _____

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 ☐

Distance (Y) between outer edge of all low volume monitor inlets and any Hi-Volume PM-10 or TSP inlet = 2 m or greater? Yes ☐ No ☐ NA ☐

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, FRM & TEOM, BAM & TEOM) 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 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 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 ☐
*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) _____ 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 2016_____ New Pictures Submitted? Yes ☐ No ☒

Reviewer _____ Date May 3, 2017

Ambient Monitoring Coordinator Kevin Lance _____ DateMay 3, 2017_____

Site Review Form Calendar Year 2016

Site Information

Region ARO	**Site Name** Waynesville School	**AQS Site # 37-087-0008**
Street Address 2236 Asheville Road		**City** Waynesville
Urban Area Not in an Urban Area	**Core-based Statistical Area** Asheville, NC	
Enter Exact		
Longitude -82.9636	**Latitude** 35.5072	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Other (explain)** **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		793.00

Name of nearest road to inlet probe Asheville Road ADT 8600 Year latest available 2014

Distance of ozone probe to nearest traffic lane (m) 151 Direction from ozone probe to nearest traffic lane SW

Comments: _____

Name of nearest major road Hwy 74 (Great Smoky Mountains Expressway) ADT 29000 Year 2014

Distance of site to nearest major road (m) 1056.35 Direction from site to nearest major road NW

Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) 771 Direction to RR NW ☐ 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) 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) 1.02

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) _____ 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 ☐

Site Review Form Calendar Year 2016

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: January 28, 2015 New Pictures Submitted? Yes ☐ No ☒

Reviewer Steve Ensley Date: October 21, 2016

Ambient Monitoring Coordinator Steve Ensley Date: 10/21/16

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.

Site Review Form Calendar Year 2016

Site Information

Region ARO	**Site Name** Canton DRR	**AQS Site # 37**-087-0013
Street Address-104 Pace Street	**City** Canton	
Urban Area Choose an item.	**Core-based Statistical Area** Asheville, NC	

Enter Exact		**Method of Measuring**	
Longitude -82.848764	**Latitude** 35.535039		
In Decimal Degrees	In Decimal Degrees	Other (explain)	**Explanation:** Google Earth
Elevation Above/below Mean Sea Level (in meters)		813.5112	

Name of nearest road to inlet probe Blackwell Drive (Hwy 215) ADT 9500 Year latest available 2014

Comments: _____

Distance of site to nearest major road (m) 331 Direction from site to nearest major road SSW

Name of nearest major road New Clyde Highway (23) ADT 17000 Year latest available 2014

Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) 297 Direction to RR SSW ☐ 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
☒ SO_2 (NAAQS) ☐ SO_2 (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 ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 4.67

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) 1.88

Distance of outer edge of probe inlet from other gas 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) _____ 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) 10 Direction from probe to nearest traffic lane NW

Site Review Form Calendar Year 2016

SULFUR DIOXIDE MONITOR RECOMMENDATIONS:

1) Maintain current monitor status? Yes ☒ *No ☐ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective _____) No ☐-

*3) Change scale of representativeness? Yes ☐ (enter new scale _) No ☐

*4) Relocate monitor? Yes ☐ No ☐

Comments: _____

Date of Last Site Pictures 11/3/16 New Pictures Submitted? Yes ☒ No ☐

Reviewer Steve Ensley Date October 21, 2016

Ambient Monitoring Coordinator Steve Ensley Date December 8, 2016

Revised 2016-12-08

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.

Site Review Form Calendar Year 2016

Site Information

Region ARO	**Site Name** Bryson City	**AQS Site # 37-173-0002**
Street Address 30 Recreation Park Drive		**City** Bryson City
Urban Area Choose an item.	**Core-based Statistical Area** Choose an item.	
Enter Exact		
Longitude -83.442228	**Latitude** 35.434846	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Other (explain)** **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		559

Name of nearest road to inlet probe Recreation Park Drive ADT 100 Year Choose an item 2010

Comments: _____

Distance of site to nearest major road (m) 416.00 Direction from site to nearest major road SSE

Name of nearest major road US 19 ADT 6800 Year 2015

Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) 240 Direction to RR SSE ☐ 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/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) 4.57

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) 1.82

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 ☐

*Distance from probe to tree (m) 15.54 Direction from probe to tree SW *Height of tree (m) 3.15

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) 20 Direction from probe to nearest traffic lane NW

Site Review Form Calendar Year 2016

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 ☐ PM10 Lead (PB) ☒ PM2.5 Cont. (BAM) ☐ PM2.5 Spec. (SASS) ☐ PM2.5 Spec. (URG) ☐ PM2.5 Cont. Spec.	☐ General/Background _____ ☐ Highest Concentration _____ ☐ Population Exposure _____ ☐ Source Oriented _____ ☒ Transport _____ ☐ Welfare Related Impacts _____	☐ Micro _____ ☐ Middle _____ ☒ Neighborhood _____ ☐ Urban _____ ☐ Regional _____	☒ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE _____ ☐ SUPPLEMENTAL SPECIATION_____ **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) 2.286
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) 2.0574 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 ☒
Distance (Y) between outer edge of all low volume monitor inlets and any Hi-Volume PM-10 or TSP inlet = 2 m or greater? Yes ☐ No ☐ NA ☒

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, FRM & TEOM, BAM & TEOM) 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 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 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 ☐
*Distance from probe to tree (m) 10.97 Direction from probe to tree ___ *Height of tree (m) 3.15

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) 25 Direction from probe to nearest traffic lane NE

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 Steve Ensley Date October 26, 2016

Ambient Monitoring Coordinator Steve Ensley DateOctober 26, 2016

Site Review Form Calendar Year 2016

Site Information

Region ARO	**Site Name** Linville Falls	**AQS Site # 37-011-0002**
Street Address-Linville Falls Road		**City Linville Falls**
Urban Area Not in an Urban Area	**Core-based Statistical Area** None	
Enter Exact		
Longitude 81.9330	**Latitude** 35.9723	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	___ **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		988.00

Name of nearest road to inlet probe Blue Ridge Parkway ADT 0 Year estimated ____

Distance of ozone probe to nearest traffic lane (m) 270 Direction from ozone probe to nearest traffic lane NNW

Comments: _____

Name of nearest major road Hwy 221 ADT 410 Year 2014

Distance of site to nearest major road (m) 1600.00 Direction from site to nearest major road SW

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) 3.66

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) 1.295

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) _____ 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 ☐

Site Review Form Calendar Year 2016

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: October 19, 2015 New Pictures Submitted? Yes ☐ No ☒

Reviewer Terri Davis Date: December 13, 2016

Ambient Monitoring Coordinator Steve Ensley Date: 1/19/17

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.

Site Review Form Calendar Year 2016

Site Information

Region ARO	**Site Name** Spruce Pine Hospital	**AQS Site # 37-121-0004**
Street Address 272 Hospital Drive		**City** Spruce Pine
Urban Area SPRUCE PINE	**Core-based Statistical Area** None	

Enter Exact		
Longitude -82.0343	**Latitude** 35.5444	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Other (explain)** **Explanation: Google earth**
Elevation Above/below Mean Sea Level (in meters)		787

Name of nearest road to inlet probe Hospital Drive ADT NA Year Choose an item 0

Comments: _____

Distance of site to nearest major road (m) 90.00 Direction from site to nearest major road NW

Name of nearest major road US 19 ADT 10000 Year 2014

Comments: NCDOT Traffic Volume Map

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) 327 Direction to RR W ☐ 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/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) _____

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 ☐ 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) _____ 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) _____ Direction from probe to nearest traffic lane ___

Site Review Form Calendar Year 2016

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 ☐ PM10 Lead (PB) ☐ PM2.5 Cont. (BAM) ☐ PM2.5 Spec. (SASS) ☐ PM2.5 Spec. (URG) ☐ PM2.5 Cont. Spec.	☐ General/Background _____ ☐ Highest Concentration _____ ☒ Population Exposure _____ ☐ Source Oriented _____ ☐ Transport _____ ☐ Welfare Related Impacts _____	☐ Micro _____ ☐ Middle _____ ☒ Neighborhood _____ ☐ Urban _____ ☐ Regional _____	☒ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE _____ ☐ SUPPLEMENTAL SPECIATION_____ **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) BAM-2.44m FRM- 2.31m

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) BAM-2.26 FRM-2.18 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 ☐

Distance (Y) between outer edge of all low volume monitor inlets and any Hi-Volume PM-10 or TSP inlet = 2 m or greater? Yes ☐ No ☐ NA ☒

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, FRM & TEOM, BAM & TEOM) 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) 1.778

*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 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 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 ☐
*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) 89 Direction from probe to nearest traffic lane WNW

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 10/31/16 New Pictures Submitted? Yes ☒ No ☐

Reviewer Terri Davis Date December 13, 2016

Ambient Monitoring Coordinator Steve Ensley DateJanuary 19, 2017

Appendix A-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 welfare-based impacts and in support of secondary standards.

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

Table A6. 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

Appendix A-3. Duke Progress Energy Skyland Siting Analysis and Additional Site Information

Duke Energy Asheville SO_2 Modeling for Monitor Placement

Introduction

On June 22, 2010, the United States Environmental Protection Agency, EPA, revised the primary sulfur dioxide, SO_2, national ambient air quality standard, NAAQS, (75 FR 35520). The EPA promulgated a new 1-hour daily maximum primary SO_2 standard at a level of 75 parts per billion, ppb, based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations.

On May 13, 2014, the EPA proposed the data requirements rule, DRR, for the 1-Hour SO_2 NAAQS (79 FR 27445). The final DRR was promulgated on Aug. 21, 2015 (80 FR 51051) [8] and requires states to gather and submit to the EPA additional information characterizing SO_2 air quality in areas with larger sources of SO_2 emissions. In the DRR, air agencies have the choice to use either monitoring or modeling to characterize SO_2 air quality near priority SO_2 sources and submit the modeling and/or monitoring to the EPA on a schedule specified by the rule.

This analysis was conducted to identify a suitable 1-hour SO_2 source-oriented monitoring site location for the 2017-2019 monitoring period intended to satisfy the DRR for Duke Energy Asheville should the facility and North Carolina Department of Environmental Quality decide to use monitoring instead of modeling to comply with the DRR. Currently, the closest SO_2 monitor is about 80 kilometers west of Duke Energy Asheville, located at 30 Recreation Park Drive, Bryson City, NC. The 1-hour background monitored air concentration for the area based on 2014 data from that monitor is 1.1 ppb or 2.9 $\mu g/m^3$.

Duke Energy Asheville

Duke Energy's Asheville Plant is a coal-fired electric generating facility located at 200 CP&L Drive in Arden, NC. The facility produces steam in two coal-fired combustion units (Units 1 and 2) and the steam is routed to steam turbines that produce electricity to sell to residential or industrial consumers. The facility is not a significant source of SO_2 emissions since it emits less than the 2,000 tons per year threshold specified in the DRR for determining which sources need to be evaluated in determining area NAAQS compliance designations. However, this facility was modeled and shown to potentially violate the SO2 NAAQS by a third-party, The Sierra Club.

A part of the requirements for the DRR is the consideration of other sources of SO_2 emissions in the vicinity of the facility. The only other large source of SO_2 emissions in the region, Evergreen Packaging in Canton, NC, is over 25 kilometers away from Duke Energy Asheville. This facility

[8] Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide Primary National Ambient Air Quality Standard, Federal Register of Aug. 21, 2015, (80 FR 51052)(FRL-9928-18-OAR), 2015-20367.

is a significant source of SO_2 emissions since it emits more than the 2,000 tons per year threshold specified in the DRR and is being examined in a different exercise. However, the facilities are far enough apart to not impact the same areas.

AERMOD Modeling

As described in the EPA SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document, or the Monitoring TAD, [9] the Division of Air Quality's, DAQ's, modeling followed the recommendations of the SO_2 NAAQS Designations Modeling Technical Assistance Document, also known as the Modeling TAD. Based on the Modeling TAD, given the source-oriented nature of SO_2, dispersion models are appropriate air quality modeling tools to predict the near-field concentrations. The AMS/EPA Regulatory Model, AERMOD, was used, as suggested in the Monitoring TAD. AERMOD is the preferred air dispersion model because it is capable of handling rural and urban areas, flat and complex terrain, surface and elevated releases and multiple sources, including, point, area and volume sources, to address ambient impacts for the designations process.

Three years of hourly SO_2 Continuous Emissions Monitor, CEM, data for each of the two stacks at the Duke Energy Asheville facility were used in the modeling. Following the example in Appendix A of the Monitoring TAD, normalized emission rates were used as input to the model. Because of the linear scalability of emissions to modeled concentrations, the relative model results using normalized emissions can be used to predict the location of maximum concentration gradients. The CEM emissions rates were normalized by dividing each hour's rate by the highest overall rate over all stacks throughout the period. Building locations, sizes and orientations relative to stacks were input into BPIP-PRIME to calculate building parameters for AERMOD. Table 7 provides the stack parameters used in the modeling analysis.

Table 7. Parameters for Duke Energy Asheville SO2 Modeling for Monitor Placement

Source ID	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temperature	Exit Velocity	Stack Diameter
	(m)	(m)	(m)	(m)	(K)	(m/s)	(m)
UNIT1	359,957.5	3,926,328.5	662	99.7	324	17.3	5.0
UNIT2	359,963.9	3,926,328.5	662	99.7	322	17.1	5.0

Receptors were spaced 100 meters apart along the fence line. A set of nested Cartesian grid receptors were generated extending outward from the fence line. The receptors were spaced 100 meters apart out to 3 km from the facility center, 500 meters apart from 3 to 5 km out and 1000 meters apart from 5 to 10 km out. Receptors were removed from the model if they were within the fence line of the facility or in areas not suitable for the placement of a permanent monitor

[9] SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document, U.S. EPA, Office of Air and Radiation, Office of Air Quality Planning and Standards, Air Quality Assessment Division, December 2013, Draft.

such as open water. The following figures are included to show the facility and modeling inputs. Figure A-125 is an aerial photo of the facility, Figure A-126 shows the emissions point and building locations and Figure A-127 shows the receptor placement.

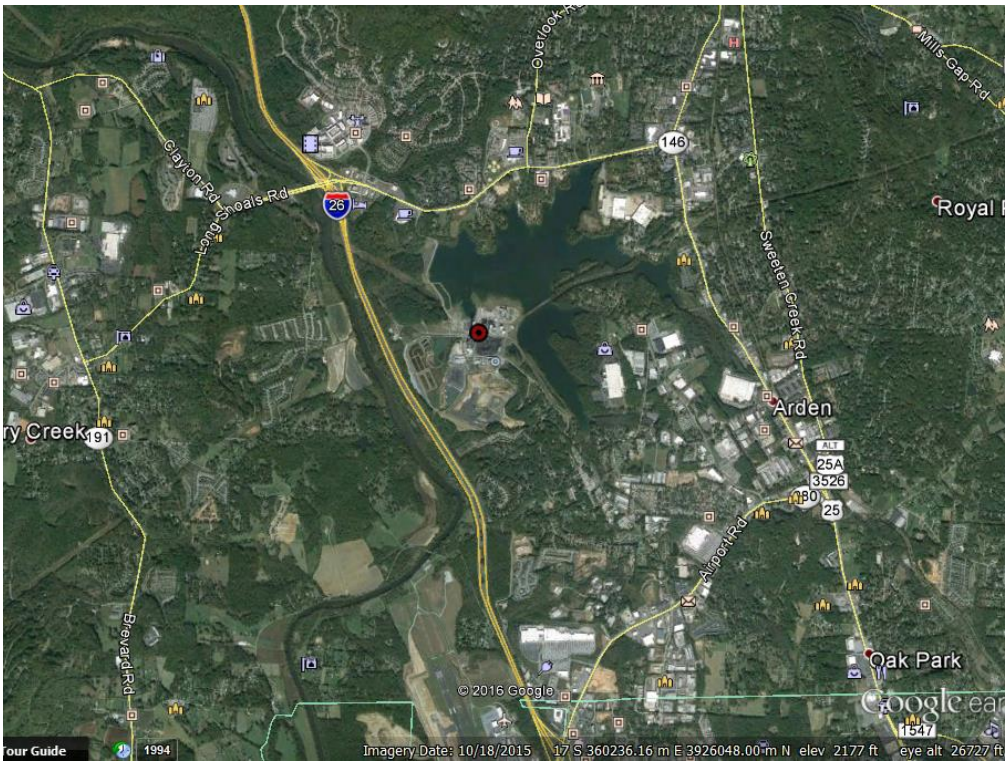

Figure A-125. Aerial View of Duke Energy Asheville and Surrounding Areas

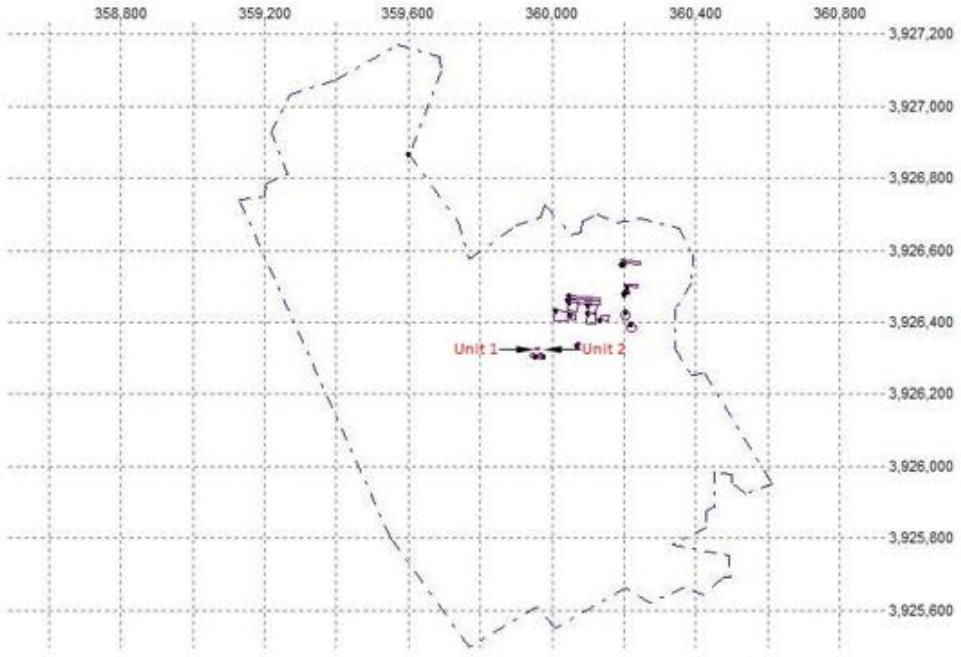

Figure A-126. Locations in Duke Energy Asheville SO2 Modeling for Monitor Placement
(UTM NAD 83 Coordinates in Meters, Zone 17)

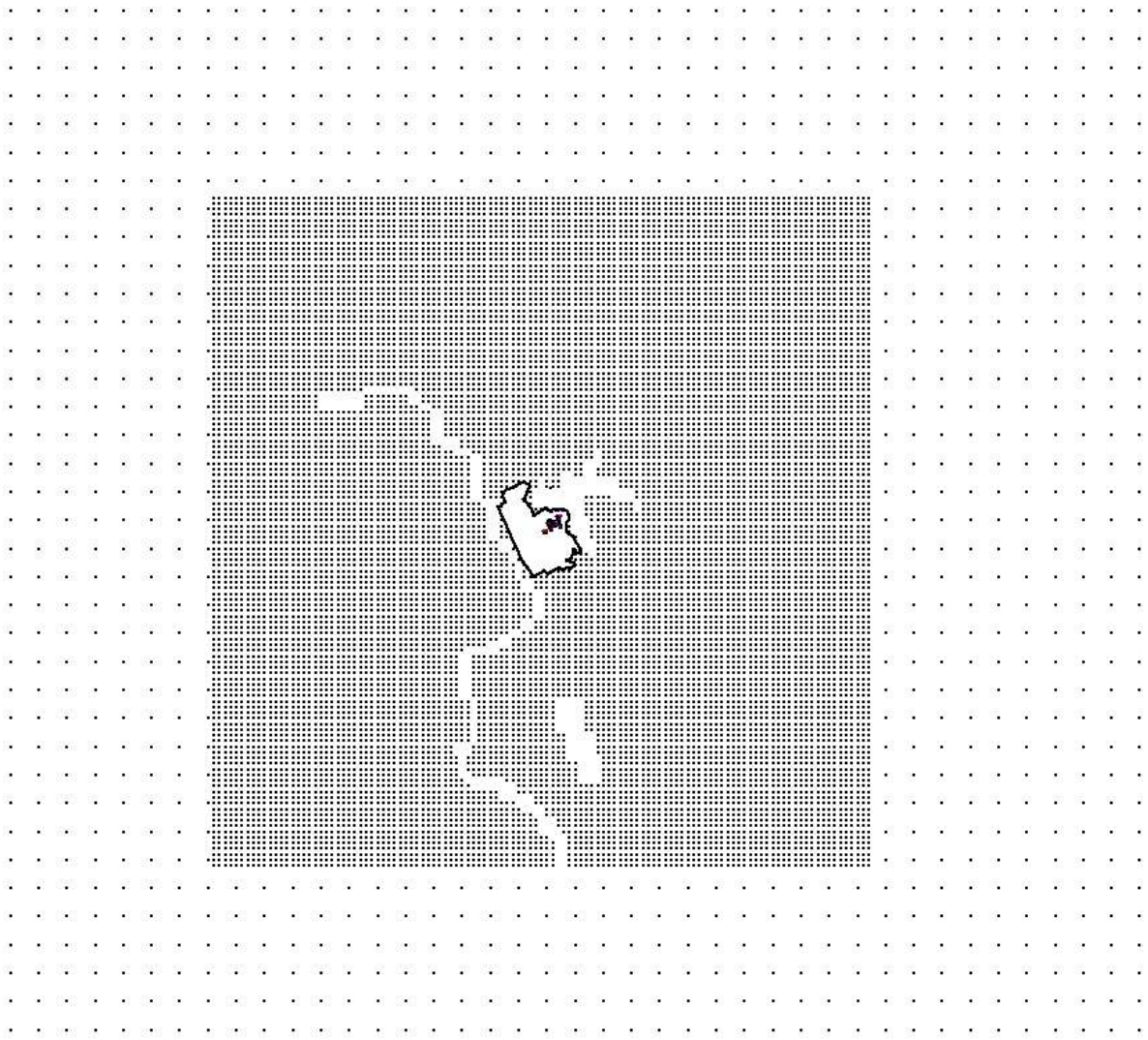

Figure A-127. Receptor Grids in Duke Energy Asheville SO2 Modeling for Monitor Placement Receptor

Terrain data used in the analysis were obtained from the USGS Seamless Data Server at http://viewer.nationalmap.gov/viewer/. The 1 arc-second NED data were obtained in the GeoTIFF format and used in determining receptor elevations and hill heights using AERMAP. National Weather Service, NWS, Automated Surface Observation Station, ASOS, data for 2012 to 2014 for the station located at Asheville, NC were processed using AERMET together with upper air data for the same period from Greensboro, NC. AERMinute was also used in processing the data to incorporate additional wind data.

Modeling Results and Ranking Methodology

Following the guidance outlined in Appendix A of the Monitoring TAD, normalized modeled impacts were used to determine suitable locations for installing an SO_2 monitor near Duke Energy Asheville. The three-year average of each year's 4th daily highest 1-hour maximum concentration (99th percentile of daily 1-hour maximum concentrations) was calculated for each receptor. This value is commonly referred to as the design value (DV). Because normalized emissions were used to calculate these values, the results are referred to as normalized design values or NDVs in this analysis.

Figure A-128 shows a contour plot of the NDVs for the receptors near Duke Energy Asheville. Individual NDV's for the higher areas are also presented. The pushpin represents the Skyland DRR monitor location.

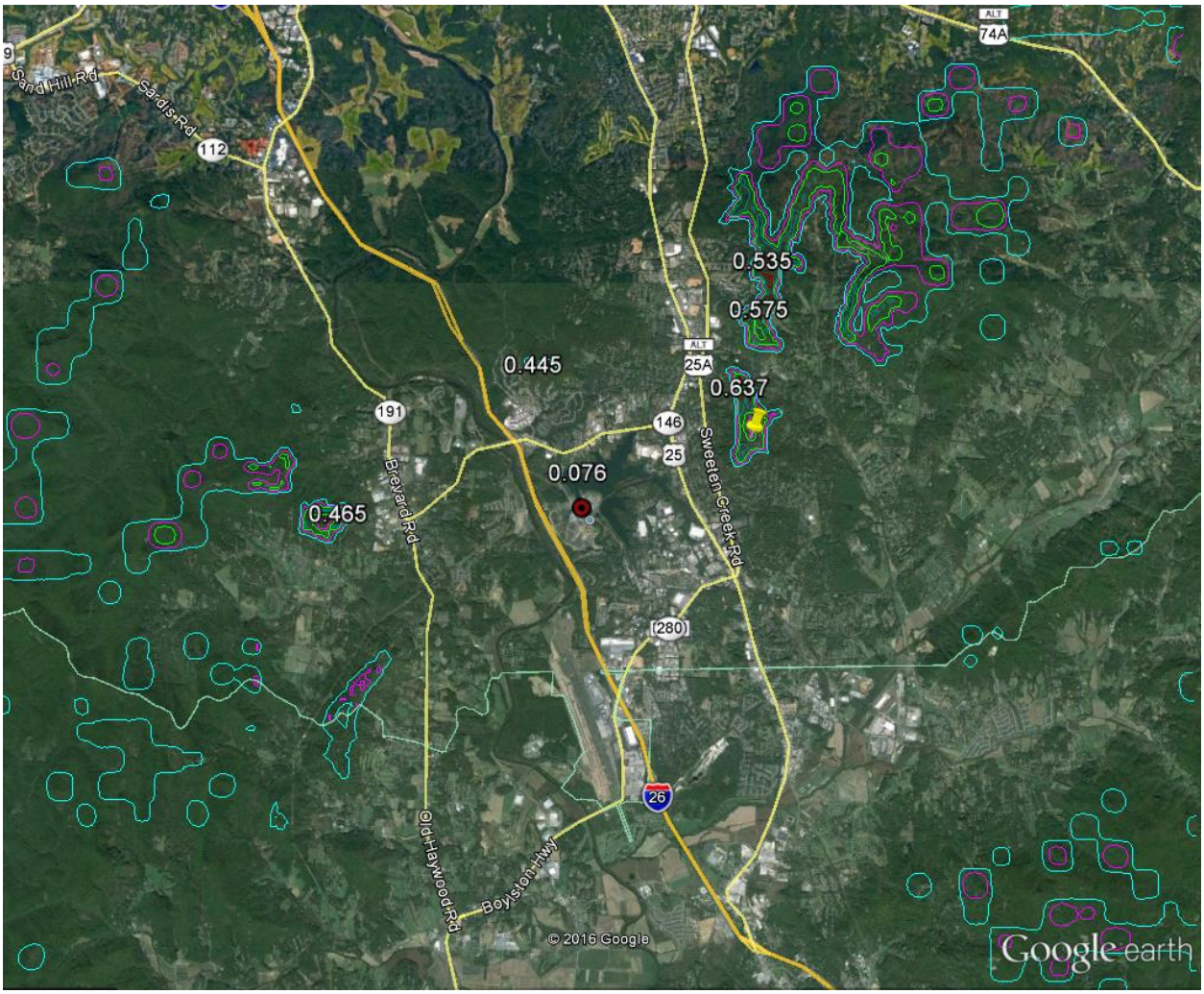

Figure A-128. Modeled NDVs for Duke Energy Asheville

Based on Appendix A of the Monitoring TAD, the site selection process also needs to account for the frequency in which a receptor has the daily maximum concentrations. The frequency is the number of times each receptor was estimated to have the maximum daily 1-hour concentration. Figure A-129 shows the results of the frequency analysis. The pushpin represents the Skyland DRR monitor location.

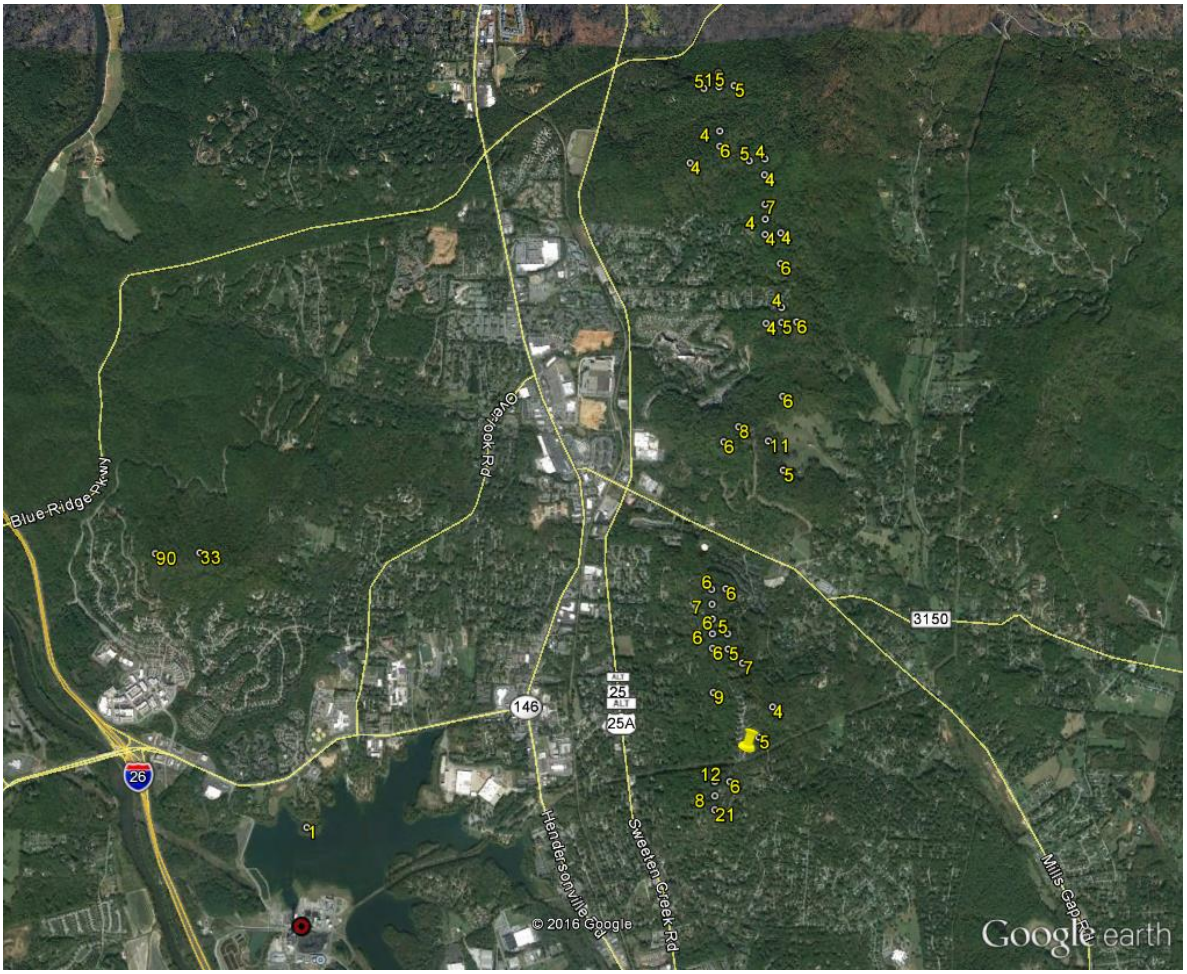

Figure A-129. Frequency of Daily Maximum Concentrations for Duke Energy Asheville

Each receptor's frequency value was used with its NDV to create a relative prioritized list of receptor locations. This process is referred to in Appendix A of the Monitoring TAD as a scoring strategy. The list of receptors was developed through the following steps:

1. The NDVs were ranked from highest to lowest. Rank 1 means the highest NDV.
2. The frequencies for the 200 receptors were ranked from the highest to lowest. Rank 1 means the highest number of days having the daily maximum value.
3. The NDV rank and the frequency rank were added together to obtain a score.

4. The scores were ranked from lowest to highest. The receptors with the lowest scores were identified as the most favorable locations for the monitor.

Ranking Results and Discussion of the Skyland DRR Monitor Site

Figure A-130 shows the receptor locations that ranked in the top 30, note that there were several ties in rankings. DAQ staff, in conjunction with Duke Energy staff and a representative from EPA Region 4, conducted an in-situ survey near the Duke Energy Asheville area to select a suitable location for SO_2 monitor placement. The survey focused on the areas to the northeast of the Asheville facility where the higher-ranking receptors are located. See Figure A-130. When selecting adequate locations for the Skyland DRR monitor, considerations were made regarding the availability of electrical power, security of the monitor, accessibility, proper instrument exposure and assurance of long-term use of the site. This last point was especially important, given the tight timelines in the rule. Most of the nearby clear area is privately-owned and there was no guarantee that we could keep the monitor there for at least three years to get a design value.

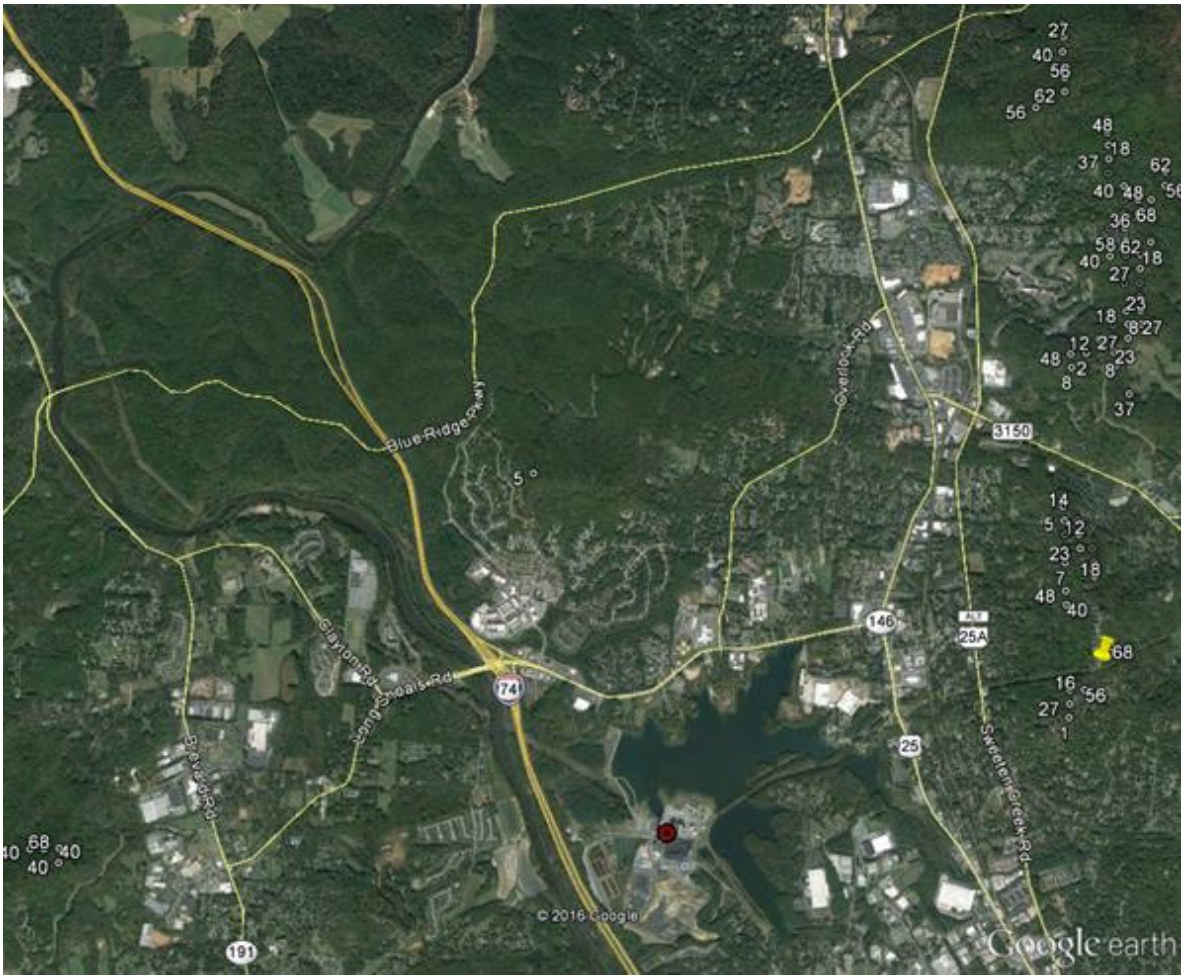

Figure A-130. Locations of Top Ranked Receptors for Duke Energy Asheville

Table 8 shows a summary of the ranking results for the top receptors and the Skyland DRR monitor location resulting from the site visit conducted using information from the scoring strategy.

Table 8. Selected Ranking Results from the Duke Energy Asheville SO2 Modeling for Monitor Placement

Easting, in meters	Northing, in meters	Normalized Design Value, NDV	NDV Ratio	NDV Rank	Freq. Count	Freq. Rank	Score	Score Rank
362,900	3,927,200	0.49	0.78	11	21	3	14	1
362,900	3,928,500	0.63	1.00	**1**	6	14	15	2
363,100	3,929,800	0.58	0.92	3	8	12	15	2
362,900	3,928,400	0.62	0.98	2	6	14	16	4
359,100	3,929,000	0.44	0.70	16	90	**1**	17	5
362,900	3,928,600	0.57	0.90	4	7	13	17	5
362,900	3,928,300	0.56	0.89	5	6	14	19	7
363,000	3,929,700	0.54	0.86	6	6	14	20	8
363,300	3,929,700	0.50	0.79	10	11	10	20	8
363,400	3,930,000	0.54	0.86	6	6	14	20	8
363,000	3,932,200	0.47	0.75	13	14	8	21	11
363,000	3,928,500	0.62	0.98	2	0	20	22	12
363,200	3,929,900	0.56	0.89	5	3	17	22	12
362,900	3,928,700	0.51	0.81	9	6	14	23	14
363,400	3,930,500	0.52	0.83	8	5	15	23	14
362,900	3,927,400	0.45	0.71	15	12	9	24	16
363,300	3,929,900	0.57	0.90	4	0	20	24	16
363,100	3,928,200	0.48	0.76	12	7	13	25	18
363,300	3,930,600	0.52	0.83	8	3	17	25	18
363,300	3,931,300	0.48	0.76	12	7	13	25	18
363,400	3,930,100	0.56	0.89	5	0	20	25	18
363,500	3,930,500	0.49	0.78	11	6	14	25	18
363,000	3,928,400	0.49	0.78	11	5	15	26	23
363,300	3,929,800	0.54	0.86	6	0	20	26	23
363,400	3,930,800	0.53	0.84	7	1	19	26	23
363,500	3,930,100	0.54	0.86	6	0	20	26	23
362,900	3,927,300	0.45	0.71	15	8	12	27	27
363,000	3,932,100	0.40	0.63	20	15	7	27	27
363,300	3,930,000	0.53	0.84	7	0	20	27	27
363,300	3,931,100	0.49	0.78	11	4	16	27	27
363,400	3,929,900	0.52	0.83	8	1	19	27	27

Table 8. Selected Ranking Results from the Duke Energy Asheville SO2 Modeling for Monitor Placement

Easting, in meters	Northing, in meters	Normalized Design Value, NDV	NDV Ratio	NDV Rank	Freq. Count	Freq. Rank	Score	Score Rank
363,400	3,930,900	0.47	0.75	13	6	14	27	27
363,500	3,930,000	0.53	0.84	7	0	20	27	27
363,500	3,930,300	0.53	0.84	7	0	20	27	27
363,500	3,930,400	0.51	0.81	9	2	18	27	27
363,400	3,930,700	0.52	0.83	8	0	20	28	36
363,100	3,928,300	0.51	0.81	9	0	20	29	37
363,300	3,931,200	0.47	0.75	13	4	16	29	37
363,400	3,929,500	0.46	0.73	14	5	15	29	37
355,500	3,926,400	0.45	0.71	15	5	15	30	40
355,700	3,926,300	0.46	0.73	14	4	16	30	40
355,700	3,926,400	0.44	0.70	16	6	14	30	40
362,900	3,928,000	0.41	0.65	19	9	11	30	40
363,000	3,932,000	0.50	0.79	10	0	20	30	40
363,300	3,930,500	0.46	0.73	14	4	16	30	40
363,300	3,930,700	0.47	0.75	13	3	17	30	40
363,400	3,931,000	0.50	0.79	10	0	20	30	40
362,900	3,928,100	0.47	0.75	13	2	18	31	48
363,000	3,929,800	0.47	0.75	13	2	18	31	48
363,100	3,928,400	0.49	0.78	11	0	20	31	48
363,300	3,931,400	0.47	0.75	13	2	18	31	48
363,300	3,931,500	0.45	0.71	15	4	16	31	48
363,400	3,929,800	0.49	0.78	11	0	20	31	48
363,500	3,930,900	0.49	0.78	11	0	20	31	48
364,900	3,929,900	0.49	0.78	11	0	20	31	48
362,800	3,931,600	0.44	0.70	16	4	16	32	56
363,000	3,927,400	0.42	0.67	18	6	14	32	56
363,000	3,931,800	0.44	0.70	16	4	16	32	56
363,400	3,930,300	0.48	0.76	12	0	20	32	56
363,500	3,930,800	0.48	0.76	12	0	20	32	56
363,700	3,931,000	0.48	0.76	12	0	20	32	56
354,100	3,927,200	0.41	0.65	19	6	14	33	62
363,000	3,931,700	0.41	0.65	19	6	14	33	62
363,600	3,930,600	0.47	0.75	13	0	20	33	62
363,700	3,931,100	0.47	0.75	13	0	20	33	62
364,800	3,929,600	0.47	0.75	13	0	20	33	62

Table 8. Selected Ranking Results from the Duke Energy Asheville SO2 Modeling for Monitor Placement

Easting, in meters	Northing, in meters	Normalized Design Value, NDV	NDV Ratio	NDV Rank	Freq. Count	Freq. Rank	Score	Score Rank
364,800	3,929,800	0.47	0.75	13	0	20	33	62
355,600	3,926,400	0.46	0.73	14	0	20	34	68
Skyland DRR Monitor Location								
362,900	**3,931,700**	**0.46**	**0.73**	**14**	**0**	**20**	**34**	**68**
363,000	3,928,600	0.44	0.70	16	2	18	34	68
363,200	3,927,700	0.41	0.65	19	5	15	34	68
363,400	3,930,400	0.44	0.70	16	2	18	34	68
363,400	3,930,600	0.42	0.67	18	4	16	34	58
363,500	3,930,200	0.46	0.73	14	0	20	34	68
363,600	3,930,900	0.46	0.73	14	0	20	34	68
364,800	3,929,700	0.46	0.73	14	0	20	34	68

The Skyland DRR location, denoted by the pushpin in Figure A-128 through Figure A-130, was selected that is approximately 3.4 km northeast of the property line of the Asheville facility. This location is underneath the high-tension line tower, in an open location free of trees or other vegetation. The selected location has a score ranking of #68 as indicated in Table 2. The location is the highest of the ranked receptors not located in densely wooded areas. Figure A-131 shows the view of the Asheville plant from near the Skyland DRR monitor location. Based on this information, DAQ believes that the Skyland DRR location is highly suitable for operating an SO_2 monitor.

Figure A-131. View of Asheville Plant from near the Skyland DRR Monitor Location

Region 4 Requested Information for Chosen Sites

In 2015, the DAQ began working with Duke Energy Progress to establish a sulfur dioxide monitoring station in Skyland, North Carolina, to characterize the ambient sulfur dioxide concentrations near the Asheville steam station as required by the data requirements rule for sulfur dioxide.[10] The area chosen for placement of the monitor was selected using the results of modeling done as described in the technical assistance document[11] and reported earlier in this appendix. An aerial view of the Skyland DRR monitoring station identified based on the earlier reported considerations is shown in Figure A-70.

The Air Quality System, AQS, identification number for this monitor is 37-021-0036-42401-1. DAQ operates this monitor in collaboration with Duke Energy Progress to ensure the air in the Asheville area complies with the national ambient air quality standards for sulfur dioxide. Duke Energy Progress operates the monitor following the DAQ quality assurance project plan and the monitor is part of the DAQ primary quality assurance organization. Figure A-71 through Figure A-78 show views from the Skyland DRR site looking north, east, southeast, south, west and northwest.

[10] Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide Primary National Ambient Air Quality Standard, Federal Register of Aug. 21, 2015, (80 FR 51052) (FRL-9928-18-OAR), 2015-20367.

[11] SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document, U.S. EPA, Office of Air and Radiation, Office of Air Quality Planning and Standards, Air Quality Assessment Division, December 2013, Draft.

The Skyland DRR monitoring site is located at least 10 meters from trees in all directions. The tallest trees are estimated to be 15.2 meters in height. The monitoring site is located approximately 30 meters from the two-story house to the north. The land slopes down to the west and up toward the east. The nearest road is Crestwood Drive located approximately 19 meters to the southeast. This road does not have traffic count data; however, as shown in Figure A-132, Royal Pines Road, had an average annual daily traffic count of 1,700 in 2014. The probe height is 3.6 meters.

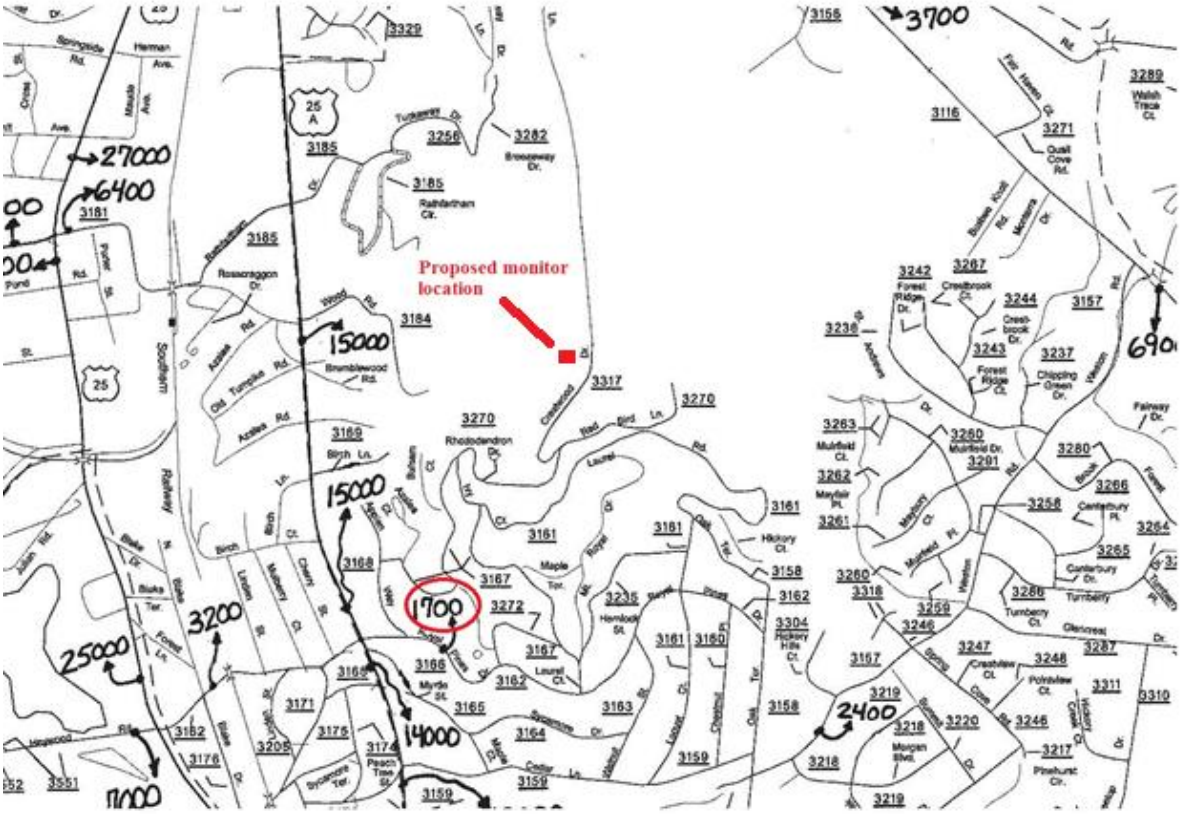

Figure A-132. 2014 Traffic count map near the Skyland DRR site (from NC DOT)

The AQS identification number and street address for the site is: 37-021-0036 and Crestwood Drive Air Monitor, Asheville Plant, Arden, North Carolina. The latitude and longitude is 35.481861 and -82.509861. The sampling and analysis method is AQS code 560, Thermo Electron 43i TLE pulsed fluorescent instrument, EQSA-0486-060, and the operating schedule is hourly. The monitoring objective is source oriented. Figure A-133 shows the location of the monitoring station relative to the population center of Buncombe County in the Arden area. Based on the wind roses in Figure A-134, the Skyland DRR monitoring station is not located downwind of the Asheville plant. However, the concentrations are higher at the Skyland DRR location than downwind from the plant because the chosen location is at a higher elevation and in the pathway of the plume. The spatial scale of representativeness for the monitor is

neighborhood scale based on the distance of the monitor from the source. The monitor is located approximately 3.4 kilometers east northeast of the property line for the facility.

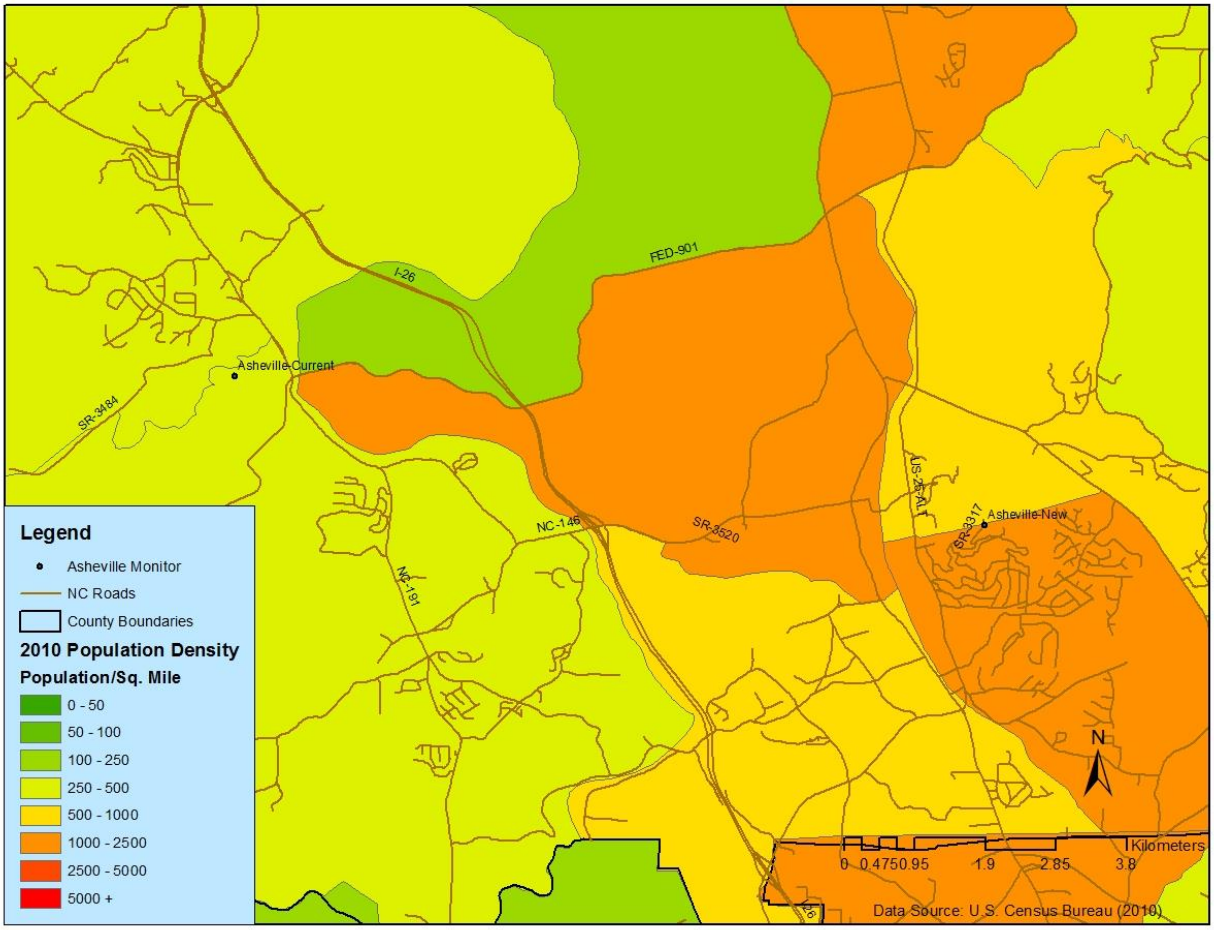

Figure A-133. Location of the Skyland DRR monitoring station relative to the population of the Arden area in Buncombe County

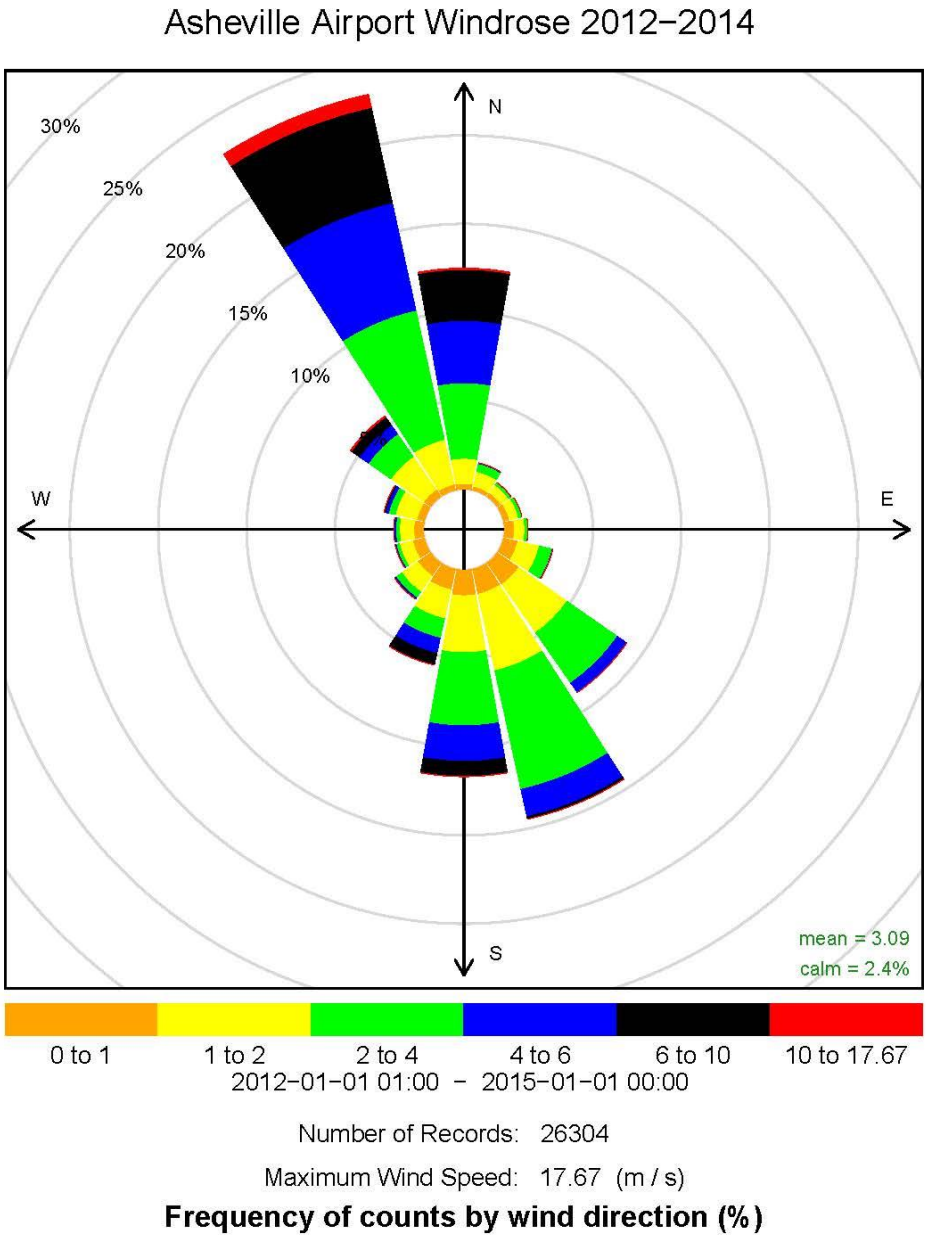

Figure A-134. Wind rose for the Asheville Airport

This monitor is in the Asheville metropolitan statistical area and is representative of the air quality downwind from the fence line of the Asheville Steam Station.

The proposed monitoring site was provided to the public for comment during 30 days in November and December as an addendum to the 2016-207 network monitoring plan.

Table 9 summarizes other factors DAQ evaluated when choosing the location for the Skyland DRR monitoring station. Table 10 summarizes the EPA-required information for the chosen Skyland DRR site.

Table 9. Other considerations in site selection

Factor	Evaluation
Long-term Site Commitment	The chosen location is on land to which Duke has obtained a lease and already has access for maintenance of power transmission lines. Because the area is needed for the power transmission lines it will not be developed any time in the next three years
Sufficient Operating Space	20-meter by 35-meter open area free of trees and buildings.
Access and Security	The building is on the right of way for the power transmission lines and underneath the tower.
Safety	Appropriate electrical permits were obtained.
Power	Location is approximately 15 meters from transformer.
Environmental Control	The monitoring shelter is a 6 foot by 6-foot trailer with the tongue of the trailer facing south.
Exposure	The monitoring station is at least 10 meters from the driplines of trees and there are no trees or buildings between the monitor and the source.
Distance from Nearby Emitters	There are no other permitted facilities within 0.5 miles of the chosen location.
Proximity to Other Measurements	The Skyland DRR monitoring station is located about 7-kilometers northeast of the Asheville Regional Airport and 11 kilometers east southeast of the Bent Creek ozone monitoring station.

Table 10. The 2016-2017 Sulfur Dioxide Monitoring Network for the Asheville MSA [a]

AQS Site Id Number:	37-021-0036
Site Name:	Skyland DRR
Street Address:	Crestwood Drive Air Monitor, Asheville Plant
City:	Arden
Latitude:	35.481861
Longitude:	-82.509861
MSA, CSA or CBSA represented:	Asheville
Monitor Type:	Industrial
Operating Schedule:	Hourly – every year
Statement of Purpose:	Maximum concentration site in the vicinity of the Duke Progress Energy Asheville Plant. Compliance w/NAAQS.
Monitoring Objective:	Source-oriented
Scale:	Neighborhood
Suitable for Comparison to NAAQS:	Yes
Meets Requirements of Part 58 Appendix A:	Yes
Meets Requirements of Part 58 Appendix C:	Yes: EQSA-0486-060
Meets Requirements of Part 58 Appendix D:	No – Data Requirements Rule
Meets Requirements of Part 58 Appendix E:	Yes
Proposal to Move or Change:	Monitoring started Jan. 6, 2017

[a] The monitor uses an instrumental pulsed fluorescence method using a Thermo Electron 43i-TLE, Air Quality System, AQS, method code 560.

Appendix A-4. Evergreen Packaging Canton Siting Analysis and Additional Site Information

Siting Analysis for the Canton DRR Site (Evergreen Packaging -- Canton)

FINAL REPORT

SO_2 DATA REQUIREMENTS RULE MONITOR SITING ANALYSIS

Evergreen Packaging – Canton Mill
Permit No. 08961T17
Facility ID No. 4400159
Canton, North Carolina

Prepared for:

Evergreen Packaging
P.O. Box 4000
Canton, NC 28716

Prepared by:

AECOM

AECOM Technical Services of North Carolina, Inc.
1600 Perimeter Park Drive, Suite 400
Morrisville, NC 27560

March 2016

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1.0 INTRODUCTION

On June 22, 2010, the EPA revised the primary sulfur dioxide (SO_2) National Ambient Air Quality Standard (NAAQS) (75 FR 35520). The EPA promulgated a new 1-hour daily maximum primary SO_2 standard at a level of 75 parts per billion (ppb), based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations.

On May 13, 2014, the EPA proposed the Data Requirements Rule (DRR) for the 1-Hour SO_2 NAAQS (79 FR 27445). The final DRR was promulgated on August 21, 2015 (80 FR 51051) and requires states to gather and submit to the EPA additional information characterizing SO_2 air quality in areas with larger sources of SO_2 emissions. In the DRR, air agencies have the choice to use either monitoring or modeling to characterize SO_2 air quality in the vicinity of priority SO_2 sources, and submit the modeling and/or monitoring to the EPA on a schedule specified by the rule.

This analysis was conducted to identify a suitable 1-hour SO_2 source-oriented monitoring site location for the 2017-2019 monitoring period intended to satisfy the DRR for Evergreen Packaging Canton (EP Canton). Currently, the two closest SO_2 monitors with valid design values are about 90 kilometers southwest and 90 kilometers southeast of EP Canton, located at 133 Perry Avenue, Greenville, SC and on Round Mountain Tower Road, Long Creek, SC. The 1-hour background monitored air concentrations for these monitors, based on 2012-2014 data are 7 ppb (18.29 µg/m^3) at the Greenville, SC monitor and 3 ppb (7.84 µg/m^3) at the Long Creek, SC monitor.

The purpose of this report is to provide a summary of modeling that was performed to estimate locations for a future SO_2 monitor near the EP Canton Mill.

2.0 FACILITY INFORMATION

2.1 Facility Description and Location

Evergreen Packaging owns and operates an integrated bleached Kraft pulp and paper mill in Canton, North Carolina. Primary operations at the mill include 5 solid fuel-fired industrial boilers, wood pulping operations, chemical recovery operations, bleaching operations, papermaking, and additional operations and equipment necessary to support these operations. The Mill started up in 1908 and produces a nominal 600,000 tons per year of uncoated fine paper and bleached paperboard.

The Canton Mill is located in Haywood County. The Mill site is located approximately 25 kilometers (km) west of Asheville, North Carolina. Figure 2-1 shows the site location and current SO_2 monitors within 200 km of the Mill.

3.0 MONITOR SITING ANALYSIS

3.1 Analysis Approach and Model Selection

As described in the EPA SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document (Monitoring TAD), the modeling followed the recommendations of the SO_2 NAAQS Designations Modeling Technical Assistance Document (Modeling TAD). According to the Modeling TAD, given the source-oriented nature of SO_2, dispersion models are appropriate air quality modeling tools to predict the near-field concentrations. The AMS/EPA Regulatory Model (AERMOD version 15181) was used, as suggested in the Monitoring TAD. AERMOD is the preferred air dispersion model because it is capable of handling rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including, point, area, and volume sources) to address ambient impacts for the designations process.

3.1.1 Meteorological Data

The EP Canton Mill is located in Canton, North Carolina approximately 25 kilometers west of Asheville in an area of complex terrain. Meteorological data for this area is not available for download on the NC DAQ website. AERMOD-ready meteorological data was created by processing surface data from the Asheville Regional Airport, upper air data from the Peachtree City, Georgia National Weather Service (NWS) site, and onsite meteorological data. The DRR requires modeling to be performed for the most recent three year period. Since the 2015 meteorological data has not been fully quality assured, meteorological data for the 2012-2014 period was processed.

3.1.2 Receptors

The dispersion modeling receptor grids were developed following procedures outlined in the *New Source Review Workshop Manual* (October 1990), the *North Carolina PSD Modeling Guidance* (January 2012), and the Modeling TAD. A detailed discrete receptor grid system was created to assess air quality impacts in all directions from the EP Canton Mill to a distance of up to 10 km from the property boundary.

Discrete receptors were placed along the property line at 50-meter intervals. A 100-meter grid spacing was used from the property line out to a distance of approximately 500 meters and 500-meter grid spacing from 500 m to 5,000 m. The remaining grid from 5,000 m to approximately 10,000 m used a 1,000-meter grid spacing. According to the Modeling TAD, receptors should only be placed where it is suitable for the placement of a permanent monitor; therefore receptors on Evergreen Packaging property and over water were removed. Figure 3-1 presents the full modeling receptor grid, while Figure 3-2 presents the near-field receptor grid along with the Evergreen Packaging property boundaries.

Terrain data used in the analysis was obtained from the USGS Seamless Data Server at http://viewer.nationalmap.gov/viewer/. The 1 arc-second NED data was obtained in the GeoTIFF format and used in determining receptor elevations and hill heights using AERMAP.

3.1.3 Sources

There are multiple SO_2 emissions sources present at the EP Canton Mill, all of which were modeled as point sources. Intermittent sources such as emergency generators were not included in the modeling as they typically do not run for an hour except during emergency situations.

The AERMOD model uses a steady-state Gaussian plume equation to model emissions from point sources such as stacks and vents. All point sources were modeled using actual stack exhaust parameters. The following parameters were used for modeling the point sources: emission rates (grams/sec), stack height (m), stack diameter (m), stack exit velocity (m/sec), stack exhaust temperature (K), and direction-specific building dimensions (m). Building locations, sizes, and orientations relative to stacks were input into BPIP-PRIME to calculate building parameters for AERMOD. Table 3-1 presents a list of the modeled facility point sources and their associated parameters. The source and building layout for modeling is shown in Figure 3-3.

Table 3-1. Modeled Stack Parameters

Source ID	Source Description	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)	Normalized Emission Rate (g/s)
BLOXRTO	RTO	30.5	324.8	8.53	1.2	$2.5x10^{-4}$
#5LIME	No. 5 Lime Kiln	62.2	335.9	8.80	1.5	$1.3x10^{-4}$
#4LIME	No. 4 Lime Kiln	58.0	337.6	9.80	1.2	$5.0x10^{-4}$
#11REC	No. 11 Recovery Boiler	61.7	413.2	18.30	3.7	$1.1x10^{-1}$
#10REC	No. 10 Recovery Boiler	61.7	410.9	17.90	3.7	$1.3x10^{-1}$
#10SDT	No. 10 Smelt Dissolving Tank	61.7	341.5	8.80	1.2	$2.5x10^{-4}$
#11SDT	No. 11 Smelt Dissolving Tank	61.7	342.0	9.10	1.2	$2.5x10^{-4}$
PMNO19A	No. 19 Paper Machine Calendar Nip Heater	20.1	499.8	0.30	0.5	$2.5x10^{-6}$
PMNO19B	No. 19 Paper Machine Calendar Nip Heater	20.1	499.8	0.30	0.5	$2.5x10^{-6}$
225NGBLS	Natural Gas Package Boilers	50.3	435.9	1.46	2.4	$2.5x10^{-4}$
RLBARKCTRL	Riley Bark Boiler	34.8	332.0	17.92	2.4	$1.0x10^{-1}$
RLCOAL#4P	No. 4 Power Boiler/Riley Coal Boiler Common Stack	79.2	327.6	19.00	3.0	4.6x10-2

3.1.4 Modeled Emissions

Hourly data was not available; therefore, maximum actual emissions for each source were used in the modeling. Following the example in Appendix A of the Monitoring TAD, normalized emission rates were

used as input to the model (Table 3-1). Because of the linear scalability of emissions to modeled concentrations, the relative model results using normalized emissions can be used to predict the location of maximum concentration gradients. The emissions rates were normalized by dividing each source's emission rate by the highest overall emission rate over all stacks.

3.2 Modeling Results and Ranking Methodology

Following the guidance outlined in Appendix A of the Monitoring TAD, normalized modeled impacts were used to determine suitable locations for installing an SO_2 monitor near the EP Canton Mill. The three year average of each year's 4th daily highest 1-hour maximum concentration (99th percentile of daily 1-hour maximum concentrations) was calculated for each receptor. This value is commonly referred to as the design value (DV). Because normalized emissions were used to calculate these values, the results are referred to as normalized design values (NDVs) in this analysis.

Figure 3-4 shows the NDVs for the receptors near EP Canton. To better understand the relative difference between the NDVs, Figure 3-5 shows the ratio of the NDV at each receptor to that of the overall maximum NDV. In the figures, the receptors with the highest values are in the black area surrounded by the darker purple. From the NDV ratio results, 200 receptors with the highest values were selected for further analysis. The receptors having the top 200 and top 50 NDVs are shown in Figures 3-6 and 3-7, respectively. The highest NDVs in the figures are shown in purple.

Figures 3-6 and 3-7 show the prioritized locations that were first evaluated to select a monitor location. The primary objective of this analysis was to find a sufficient number of feasible locations with predicted peak and/or relatively high SO_2 concentrations where a permanent monitoring site could be located. However; according to Appendix A of the Monitoring TAD, the site selection process also needed to account for the frequency in which a receptor has the daily maximum concentrations. The frequency is the number of times each receptor was estimated to have the maximum daily 1-hour concentration. Figure 3-8 shows the results of the frequency analysis.

Each receptor's frequency value was used with its NDV to create a relative prioritized list of receptor locations. This process is referred to in Appendix A of the Monitoring TAD as a scoring strategy. The list of receptors was developed through the following steps:

1. The NDVs were ranked from highest to lowest. Rank 1 means the highest NDV.
2. The frequencies for the receptors were ranked from the highest to lowest. Rank 1 means the highest number of days having the daily maximum value.
3. The NDV rank and the frequency rank were added together to obtain a score.
4. The scores were ranked from lowest to highest. The receptors with the lowest scores were identified as the most favorable locations for the monitor.

3.2.1 Ranking Results

Table 3-2 shows a summary of the ranking results for the top 10 receptors. Figure 3-9 shows the receptor locations that ranked in the top 50 (note that as shown in Table 3-2 there were some ties in

rankings). Figures 10 through 12 show a pair of plots with a closer view of the three areas with the highest receptor rankings. The first plot (a), shows the frequency of the daily maximums, while the second plot (b), shows the score rankings.

To aid NCDAQ and EPA monitor siting staff, on-property receptors were added in Areas 2 and 3 on the frequency plots. The Area 2 plot (Figure 11a) shows the low frequency of daily maximums over the EP property between School Street and High Street. The Area 3 plot (Figure 12a) shows low frequencies of daily maxima along the edge of the fenced parking lot off of Bridge Street, and no daily maxima occurrences over the parking lot. It should be noted that the both of these areas are periodically patrolled by Mill security guards.

NCDAQ staff, in conjunction with Evergreen Packaging staff and a representative from EPA Region 4, conducted a survey in the vicinity of the EP Canton Mill to evaluate potential locations for SO_2 monitor placement. The survey focused on the three areas where the majority of the maximum NDVs occurred. When selecting adequate locations for the proposed monitor, considerations will be made regarding the availability of electrical power, security of the monitor, accessibility, proper instrument exposure, and assurance of long-term use of the site. This last point will be especially important, given the tight timelines in the rule. Additional consideration for frequency of impact will need to be considered for determining the need of any secondary monitors.

Table 3-2. Top 10 Ranking Receptors by Score

UTM Zone 17 (NAD83)		Normalized Design Value (NDV)	NDV Rank	Frequency Count	Frequency Rank	Score	Score Rank	Comments on Location
Easting (m)	Northing (m)							
332512.3	3933970.5	1.31	2	70	1	3	1	Edge of EP Property, east of Blackwell Drive (Area 1)
332493.3	3933945.2	1.32	1	60	3	4	2	
332474.3	3933919.8	1.29	3	31	9	12	3	
332534.3	3933998.7	1.17	8	35	6	14	4	
333387.3	3934178.5	1.14	13	15	19	32	5	Edge of EP Property, on edge of School St. (Area 2)
332417.2	3934010.6	1.02	31	48	4	35	6	Private property, west of Blackwell Drive (Area 1)
333311.7	3934353.1	1.17	10	12	26	36	7	On Blackwell Drive (Area 1)
332517.2	3934010.5	1.09	22	19	14	36	7	Edge of EP Property, on edge of High St. (Area 2)
333596.8	3933934.4	1.06	23	16	17	40	9	Corner of EP Property & private property, on edge of Plum St. (Area 3)
332317.2	3933910.6	1.13	16	13	25	41	10	Private property, west of Blackwell Drive (Area 1)

Figures

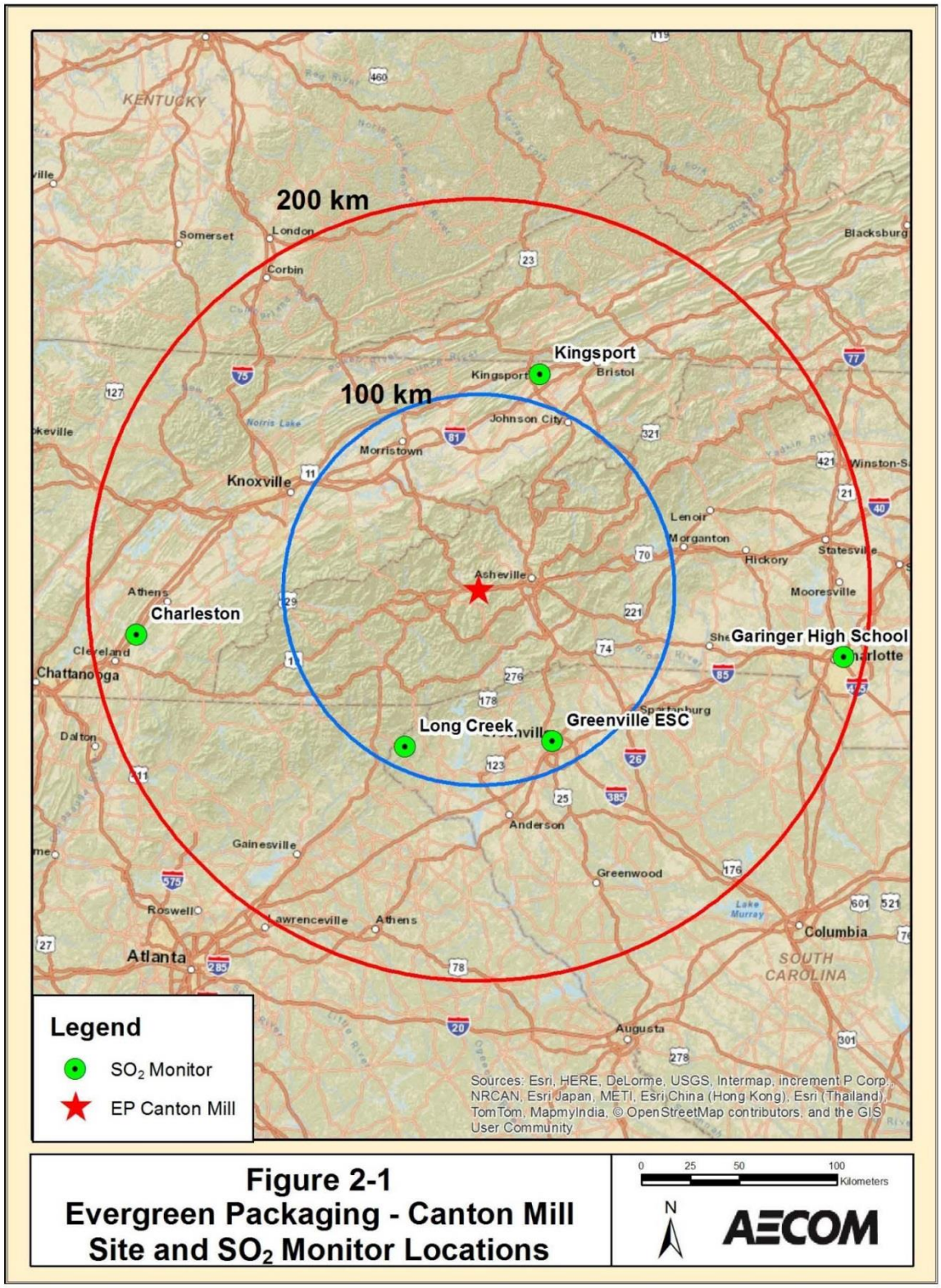


Figure 2-1
Evergreen Packaging - Canton Mill Site and SO_2 Monitor Locations

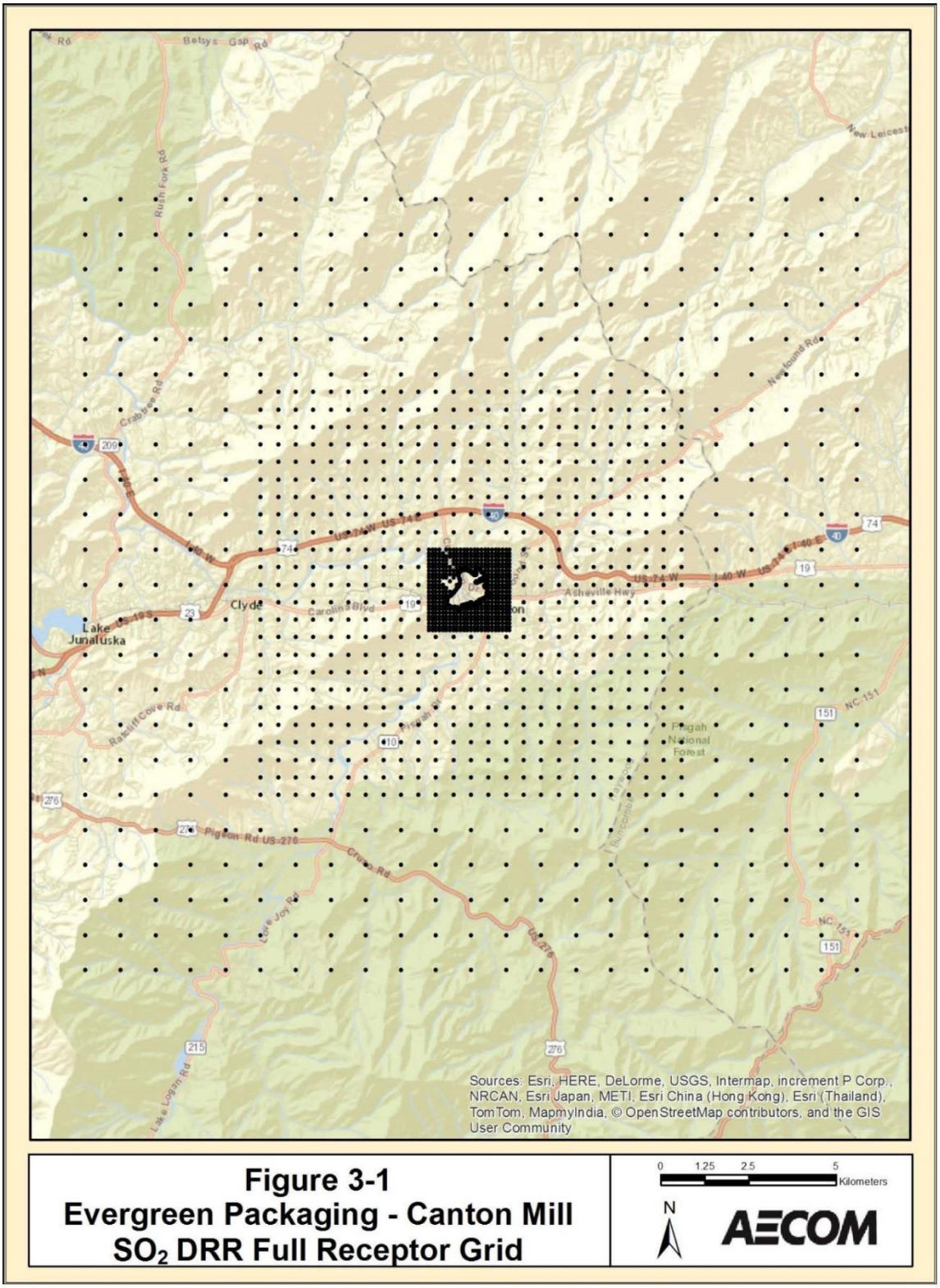


Figure 3-1
Evergreen Packaging - Canton Mill
SO_2 DRR Full Receptor Grid

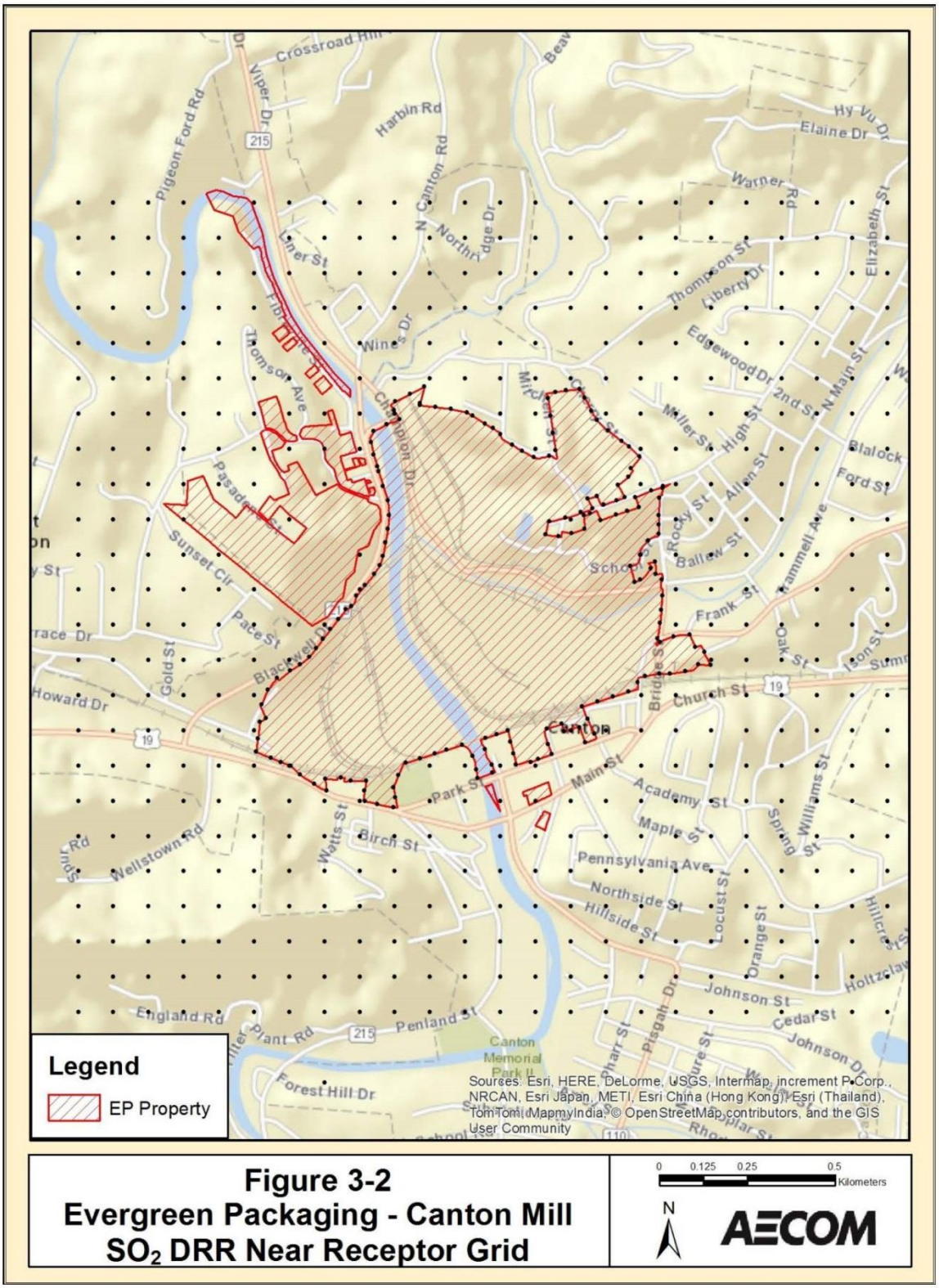
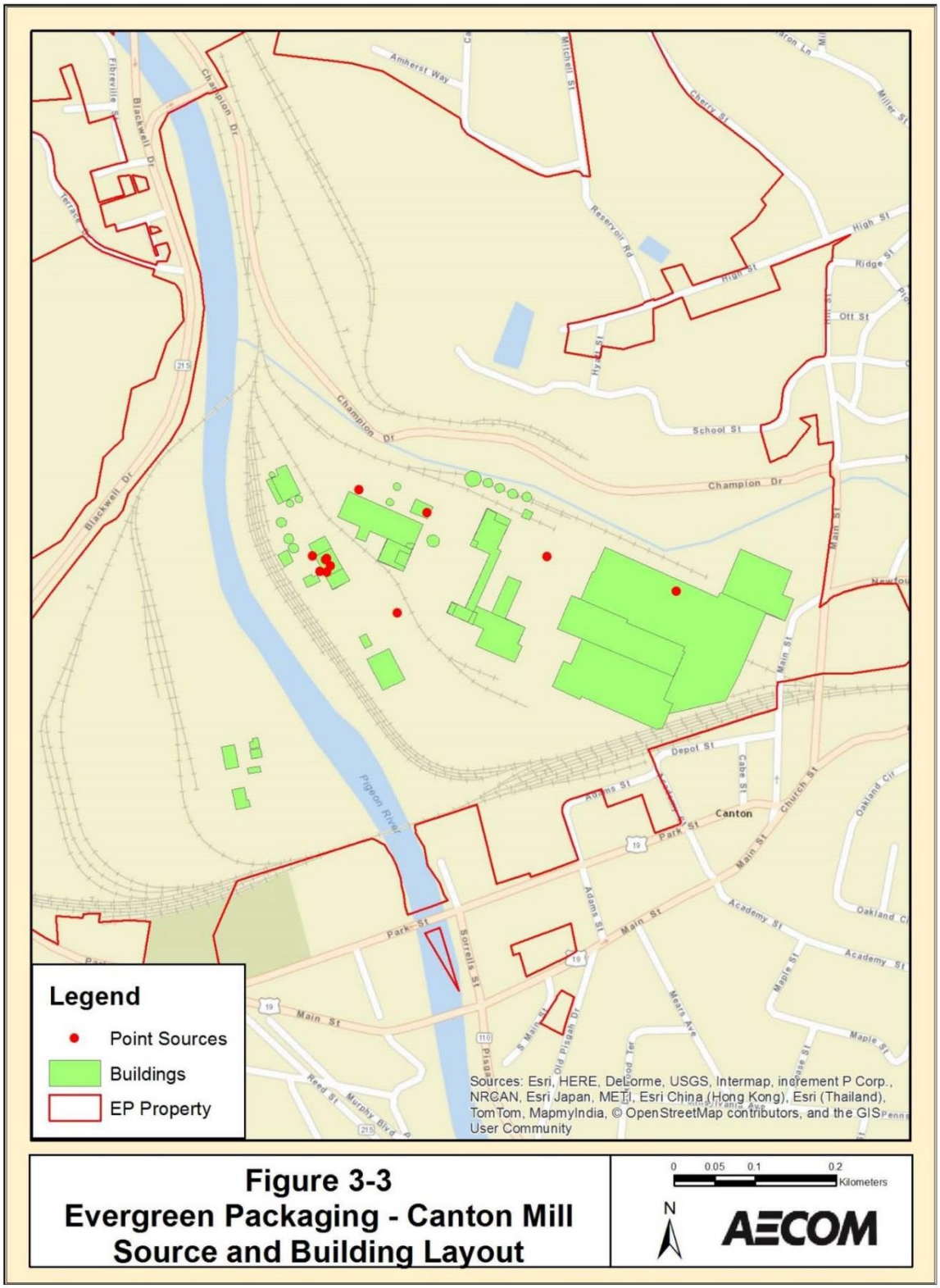


Figure 3-2
Evergreen Packaging - Canton Mill
SO_2 DRR Near Receptor Grid


Legend
Point Sources
Buildings
EP Property
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Champion Dr
Blackwell Dr
Amherst Way
Mitchell St
Cherry St
Reservoir Rd
High St
Ridge St
Ott St
School St
Main St
Depot St
Adams St
Cabe St
Church St
Oakland Cir
Canton
Park St
Academy St
Maple St
Sorrells St
Pigeon River
S Main St
Old Pisgah Dr
Meyers Ave
Reed St
Murphy Blvd
Figure 3-3
Evergreen Packaging - Canton Mill
Source and Building Layout
0 0.05 0.1 0.2
Kilometers
N
AECOM

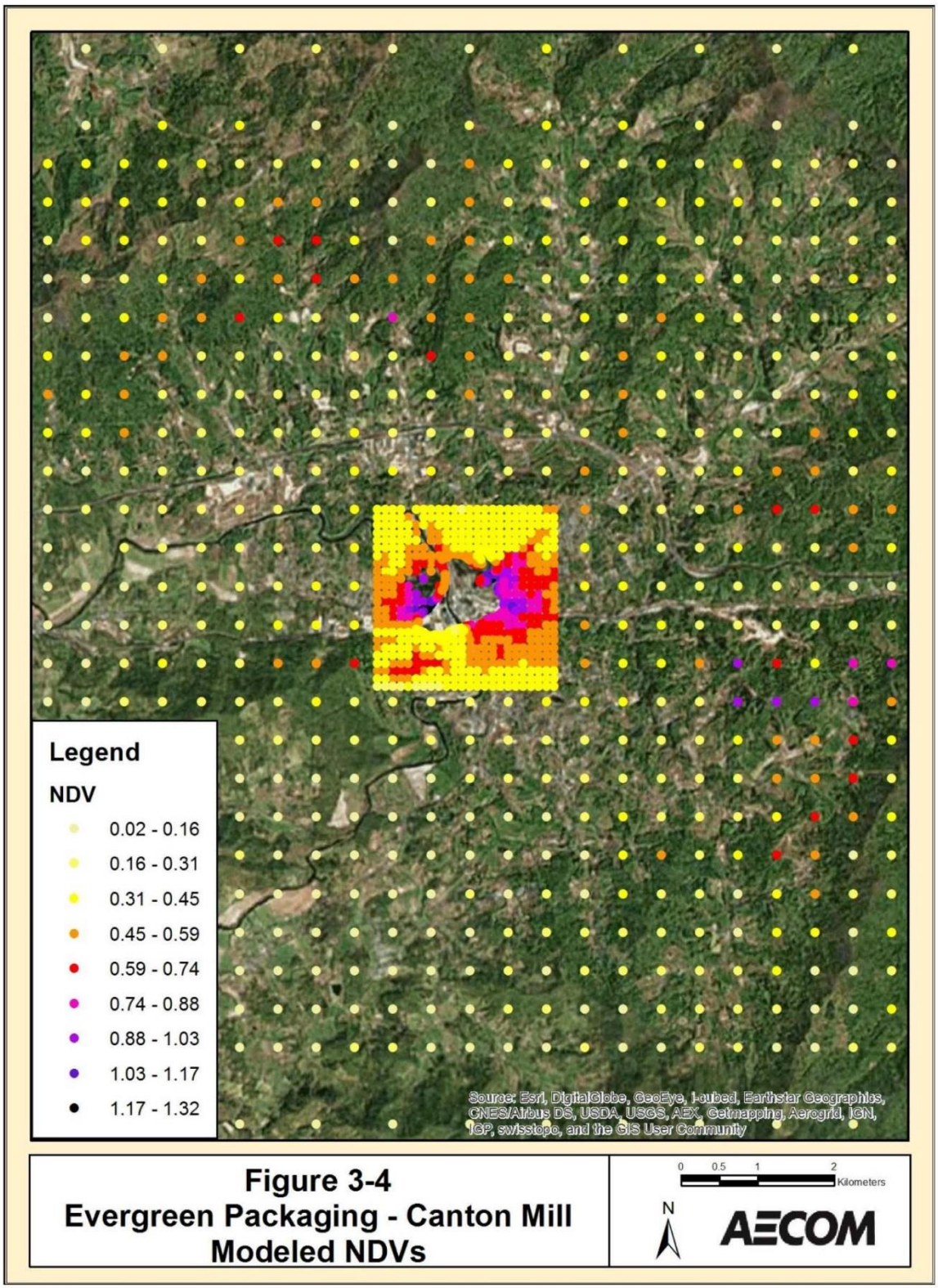


Figure 3-4
Evergreen Packaging - Canton Mill
Modeled NDVs

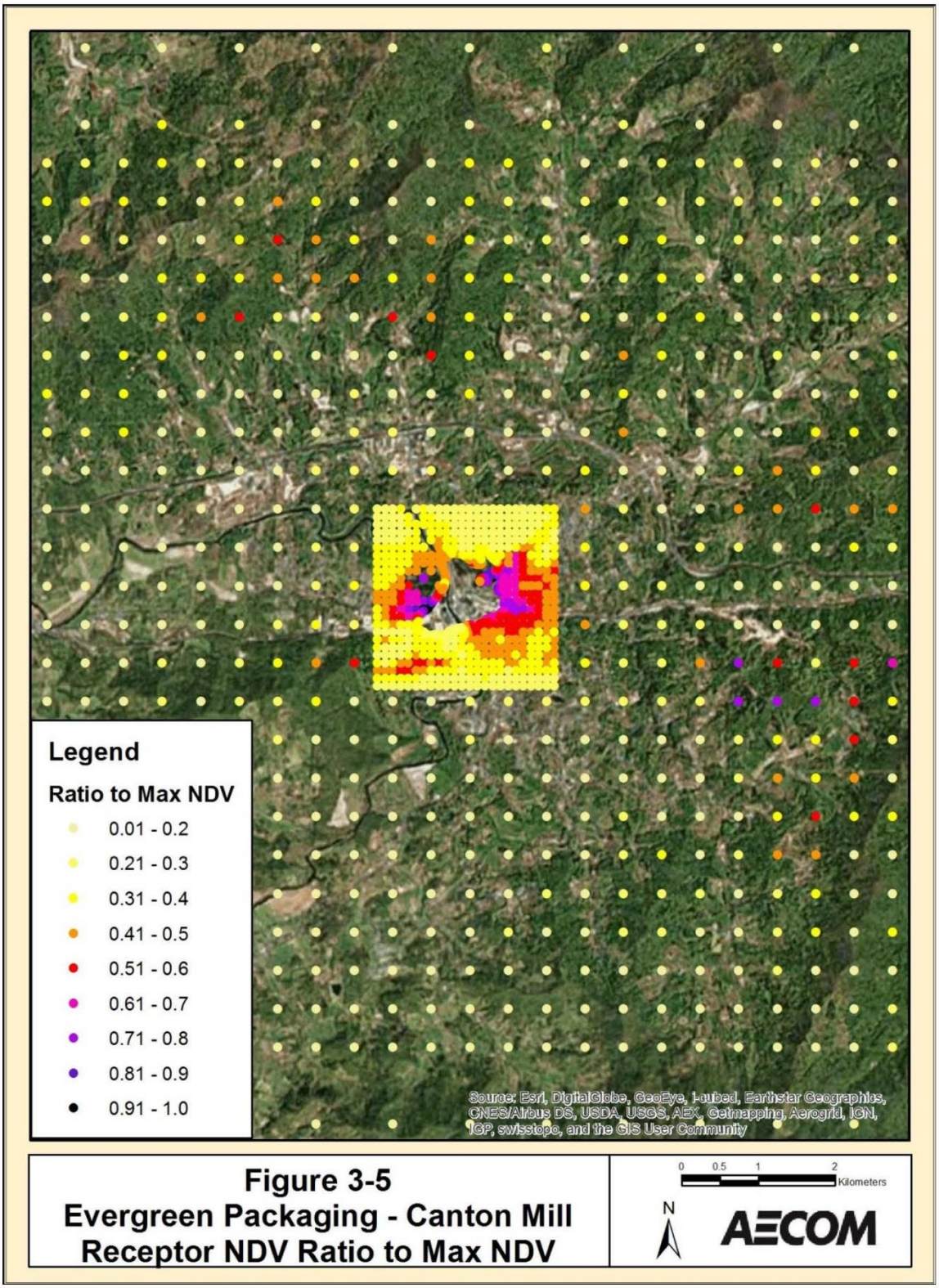


Figure 3-5
Evergreen Packaging - Canton Mill
Receptor NDV Ratio to Max NDV

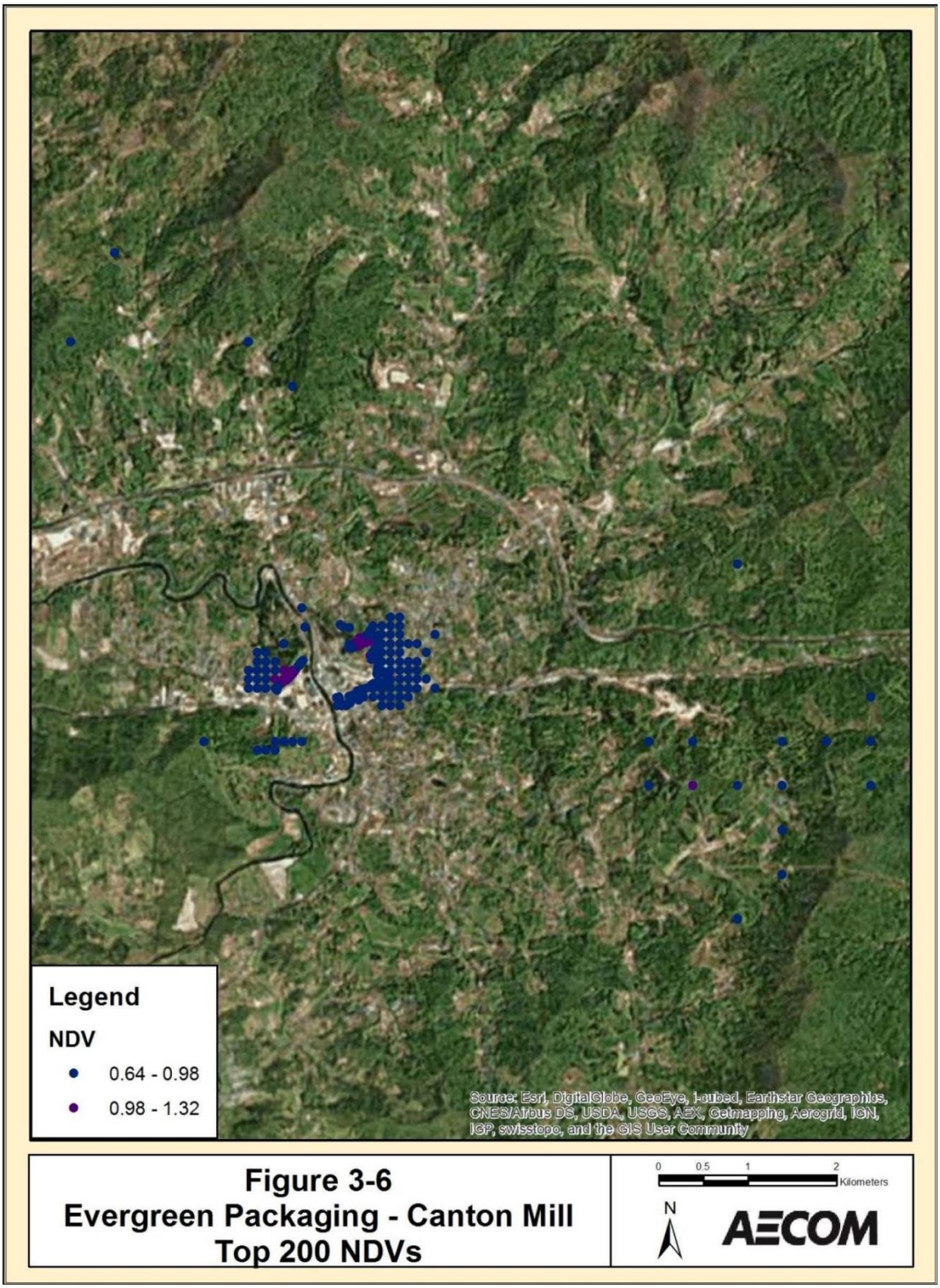


Figure 3-6
Evergreen Packaging - Canton Mill
Top 200 NDVs

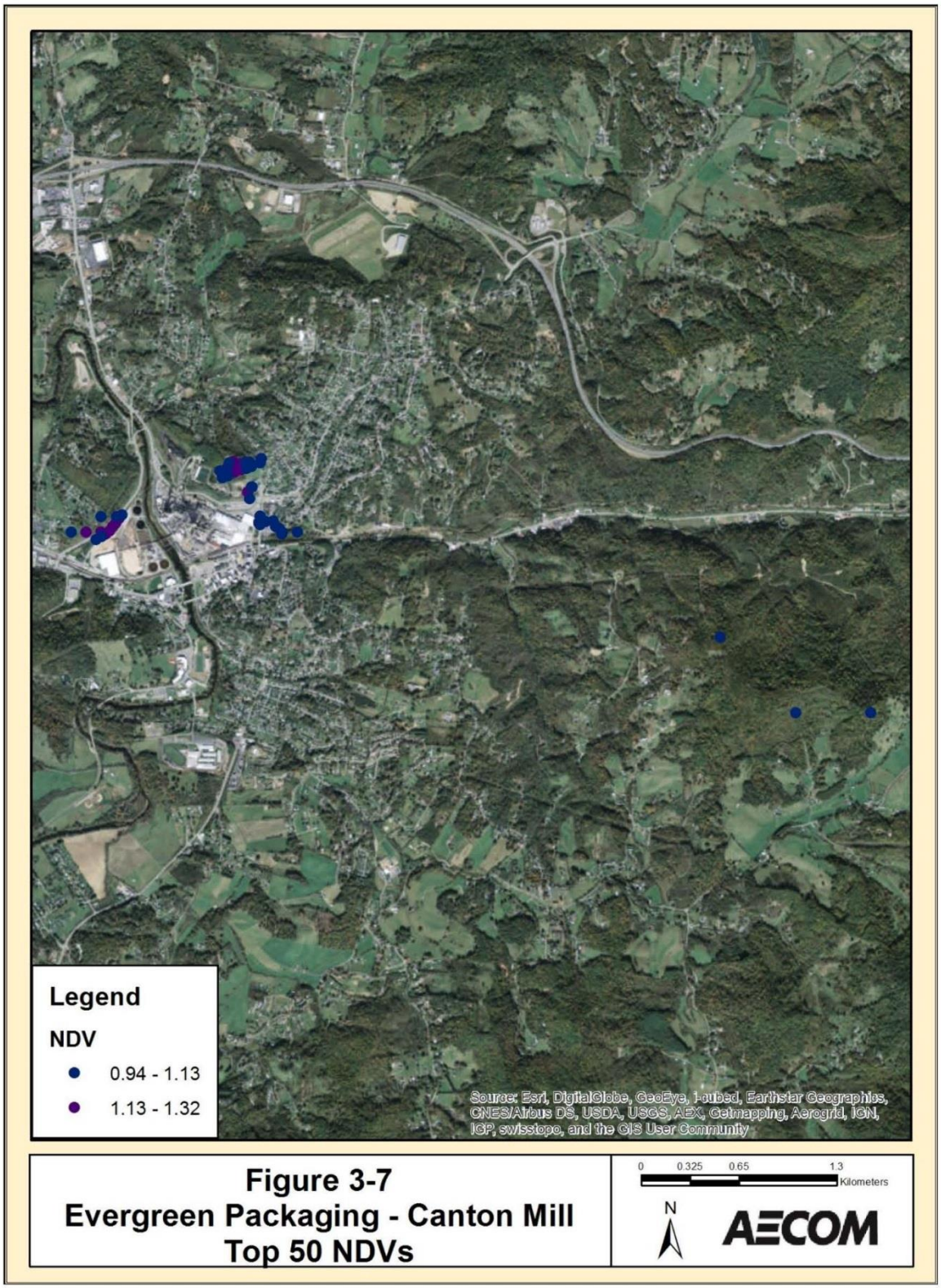


Figure 3-7
Evergreen Packaging - Canton Mill
Top 50 NDVs

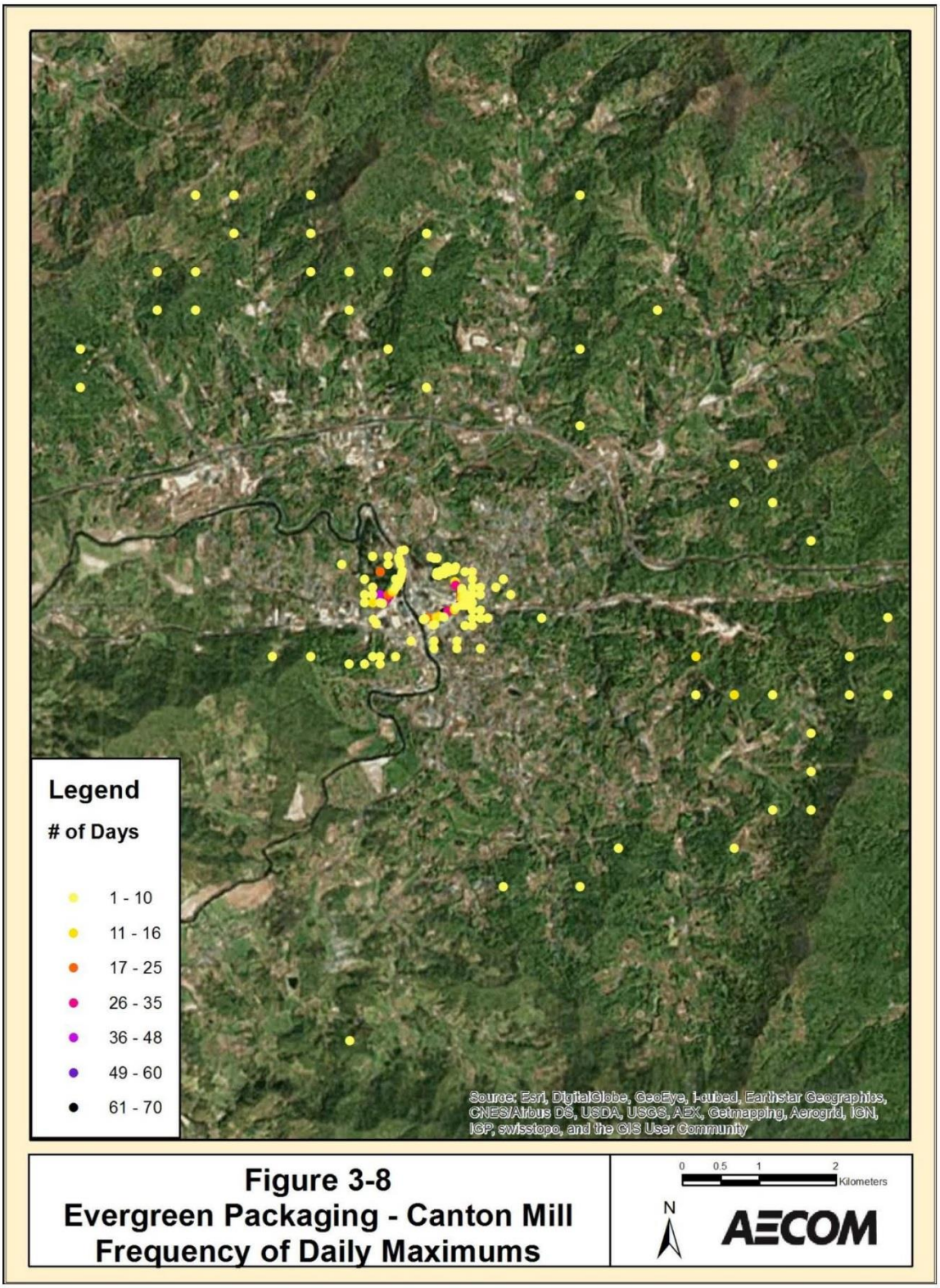


Figure 3-8
Evergreen Packaging - Canton Mill
Frequency of Daily Maximums

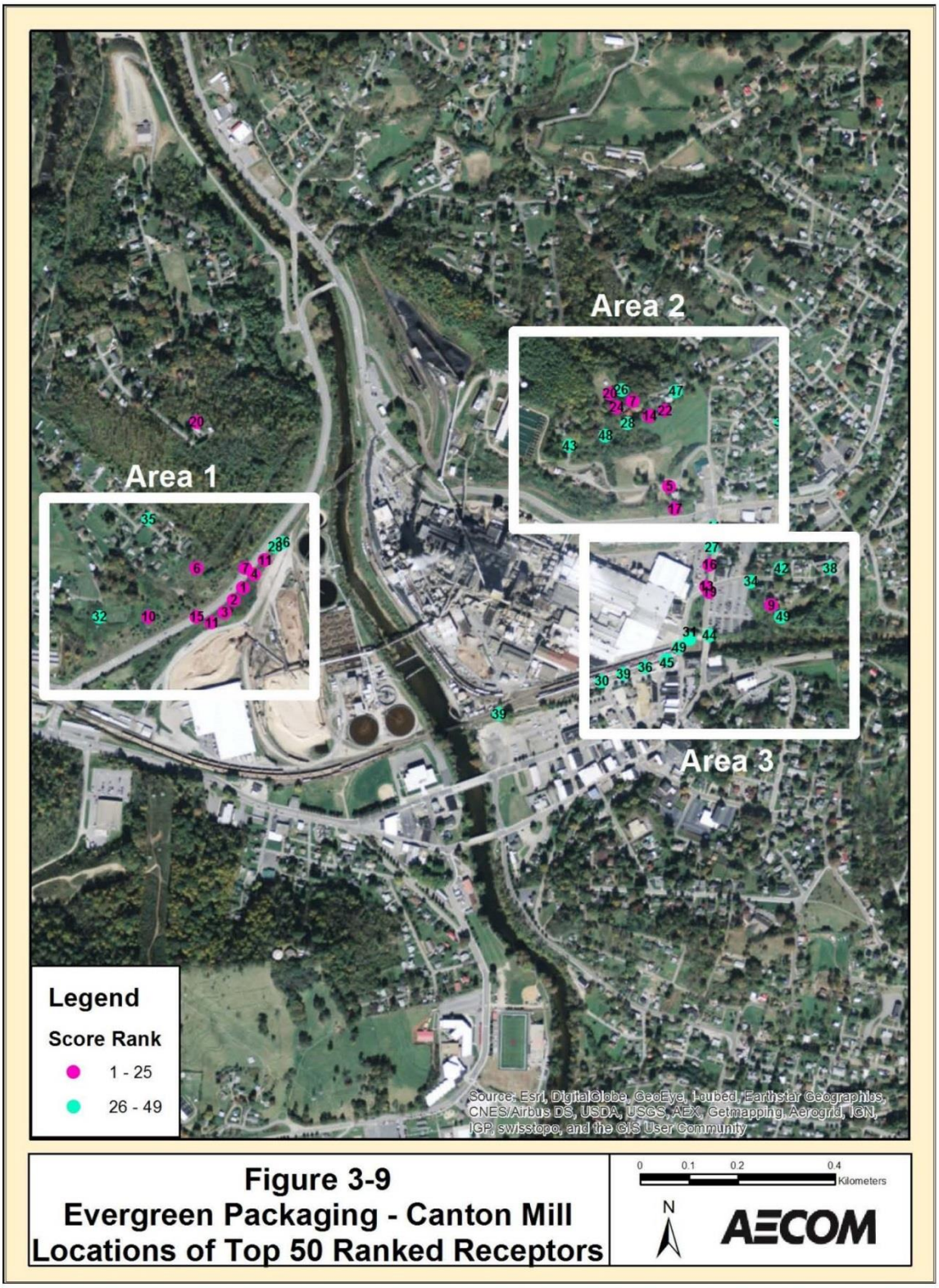


Figure 3-9
Evergreen Packaging - Canton Mill
Locations of Top 50 Ranked Receptors

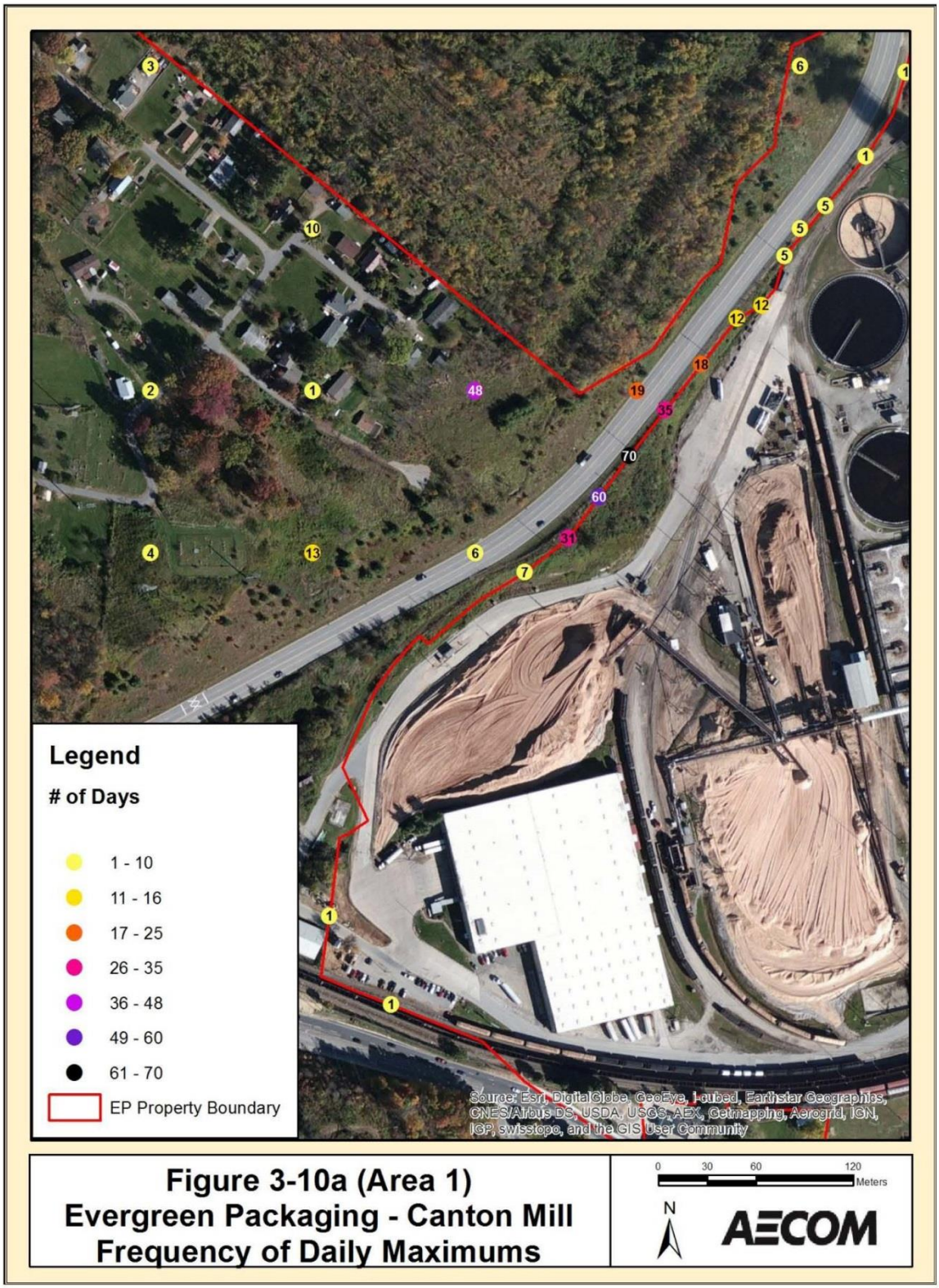


Figure 3-10a (Area 1)
Evergreen Packaging - Canton Mill
Frequency of Daily Maximums

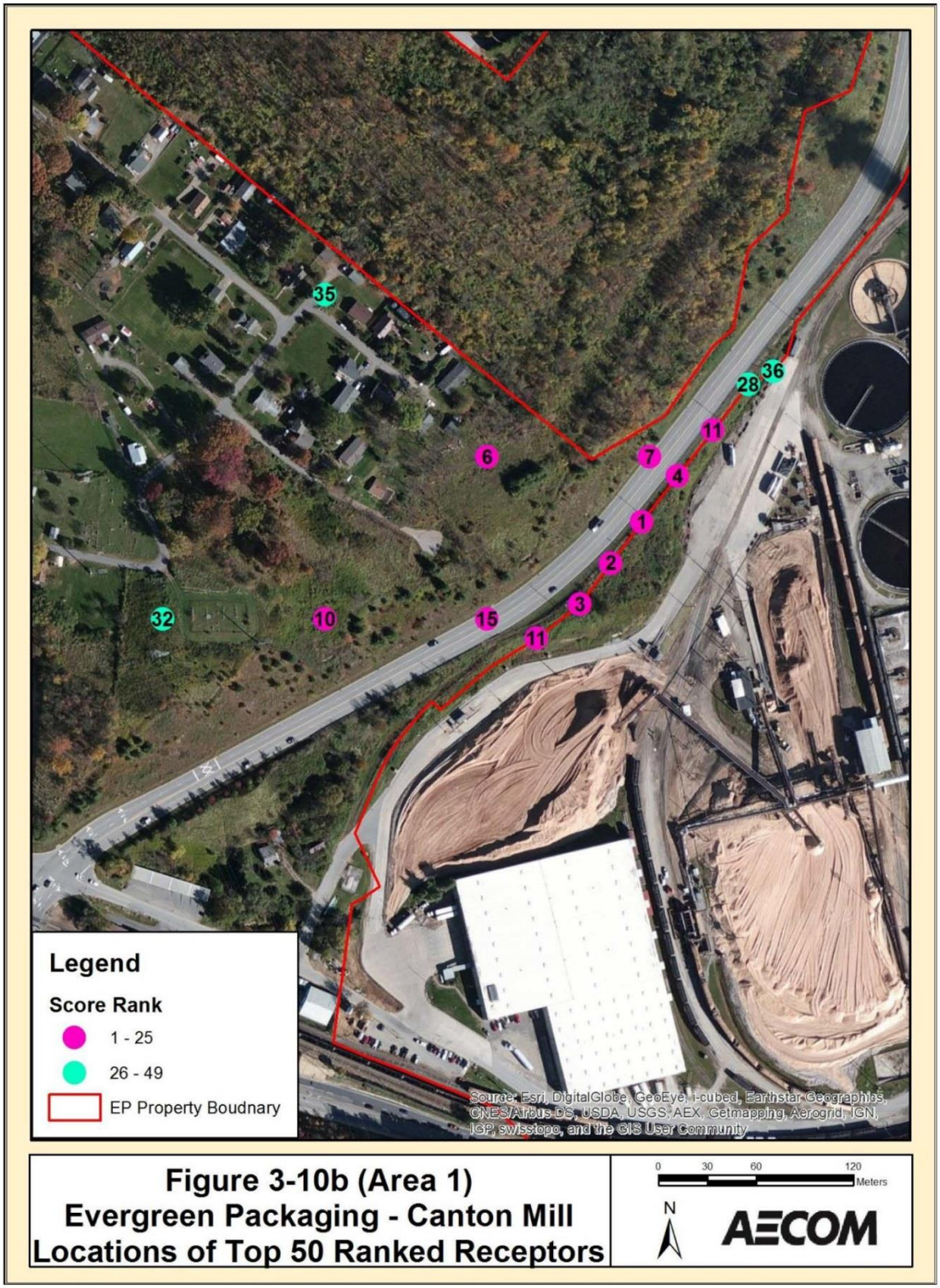


Figure 3-10b (Area 1)
Evergreen Packaging - Canton Mill
Locations of Top 50 Ranked Receptors

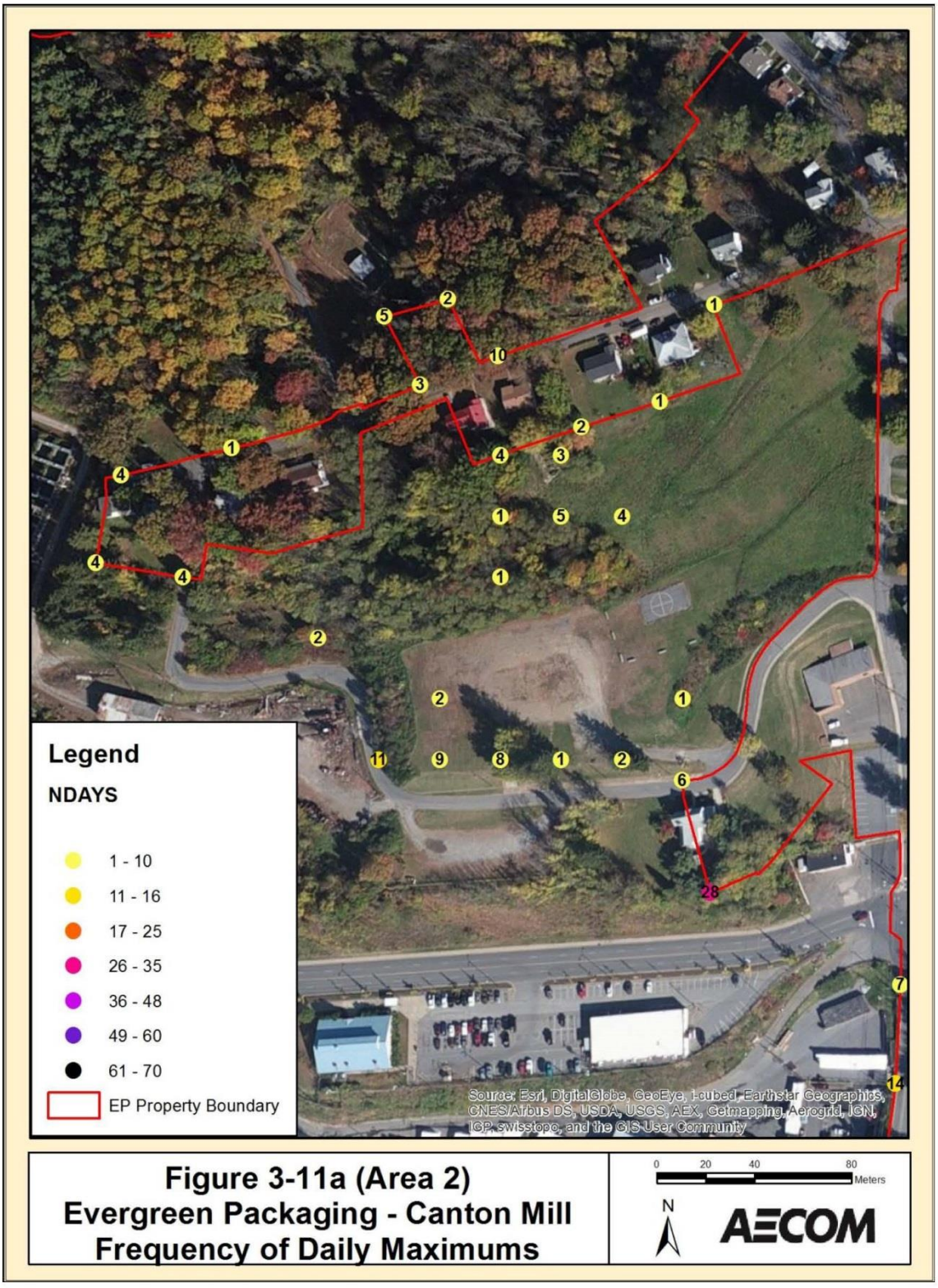


Figure 3-11a (Area 2)
Evergreen Packaging - Canton Mill
Frequency of Daily Maximums

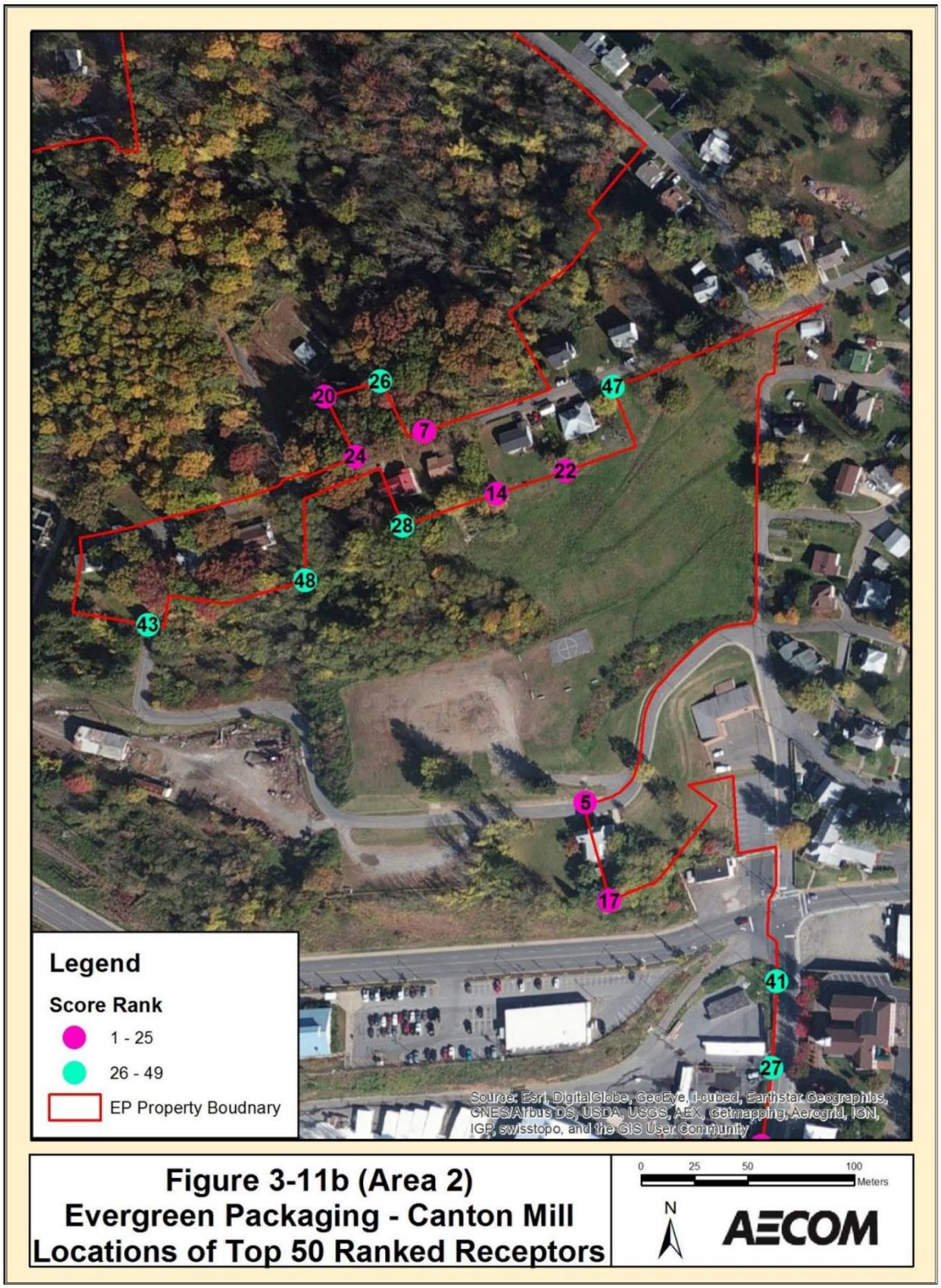


Figure 3-11b (Area 2)
Evergreen Packaging - Canton Mill
Locations of Top 50 Ranked Receptors

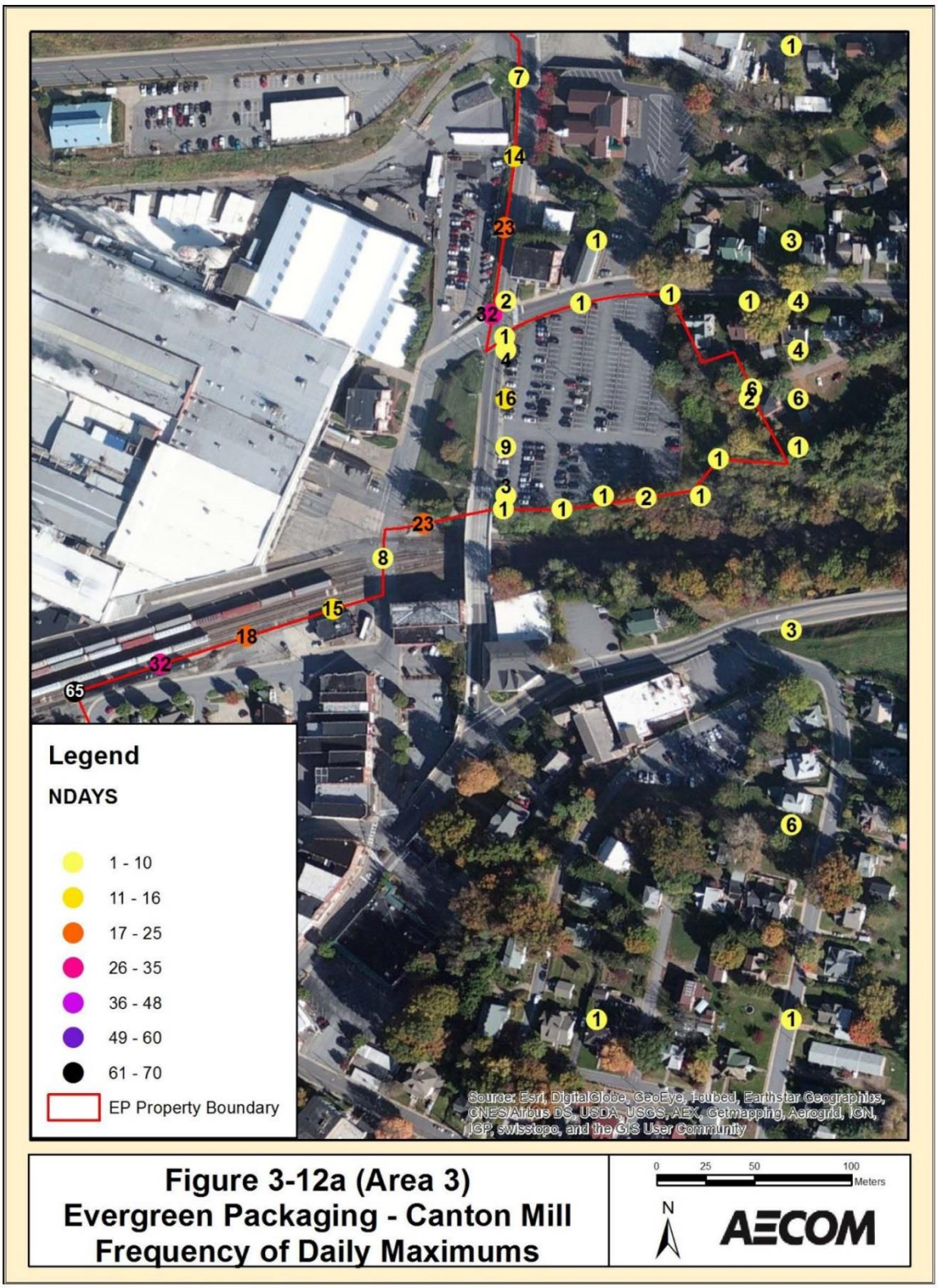


Figure 3-12a (Area 3)
Evergreen Packaging - Canton Mill
Frequency of Daily Maximums

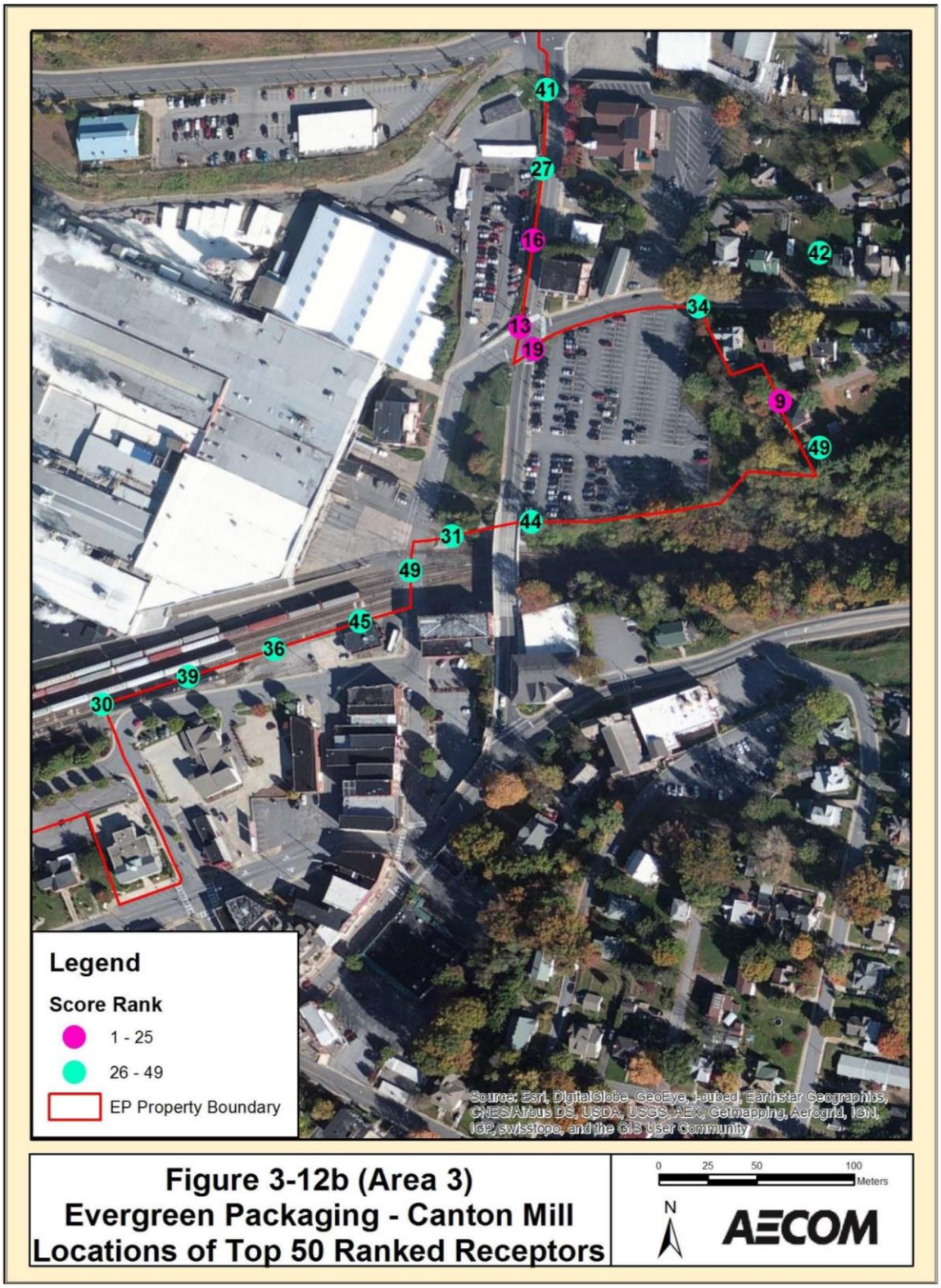


Figure 3-12b (Area 3)
Evergreen Packaging - Canton Mill
Locations of Top 50 Ranked Receptors

Region 4 Requested Information for the Canton DRR Site (Evergreen Packaging – Canton)

In 2015, the North Carolina Division of Air Quality, DAQ, began working with Evergreen/Blue Ridge Paper to establish a sulfur dioxide monitoring station in Canton, North Carolina, to characterize the ambient sulfur dioxide concentrations near the Evergreen/Blue Ridge Paper facility as required by the data requirements rule for sulfur dioxide.[12] The area chosen for placement of the monitor was selected using the results of modeling done as described in the technical assistance document[13] and is reported in the body of this document. An aerial view of the Canton DRR monitoring location identified based on the earlier reported considerations is shown in Figure A-85. The facility is located to the east.

The AQS identification number for this monitor is 37-087-0013-42401-1. DAQ operates this monitor in collaboration with Evergreen to ensure the air in the Asheville area complies with the national ambient air quality standards for sulfur dioxide. The DAQ Asheville Regional Office staff operates the monitor following the DAQ quality assurance project plan and the monitor is part of the DAQ primary quality assurance organization. Figure A-86 through Figure A-94 show the Canton DRR site and views from the site looking north, northeast, east, southeast, south southwest, west and northwest.

The DAQ removed any trees or brush within 10 meters of the Canton DRR monitoring location. The nearest road is Pace Street, a dead-end road, located approximately 10 meters to the west northwest. This road does not have traffic count data; however, as shown in **Figure A-132**, Gold Street, secondary road number 1560, had an annual average daily traffic count of 340 in 2014. Thus, the annual average daily traffic count on Pace Street is probably much less than 340. The monitor is 40 meters northwest of Blackwell Drive, which had an average annual daily traffic count of 9,500 in 2014. The probe height is 3.6 meters.

[12] Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide Primary National Ambient Air Quality Standard, Federal Register of Aug. 21, 2015, (80 FR 51052) (FRL-9928-18-OAR), 2015-20367.

[13] SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document, U.S. EPA, Office of Air and Radiation, Office of Air Quality Planning and Standards, Air Quality Assessment Division, December 2013, Draft.

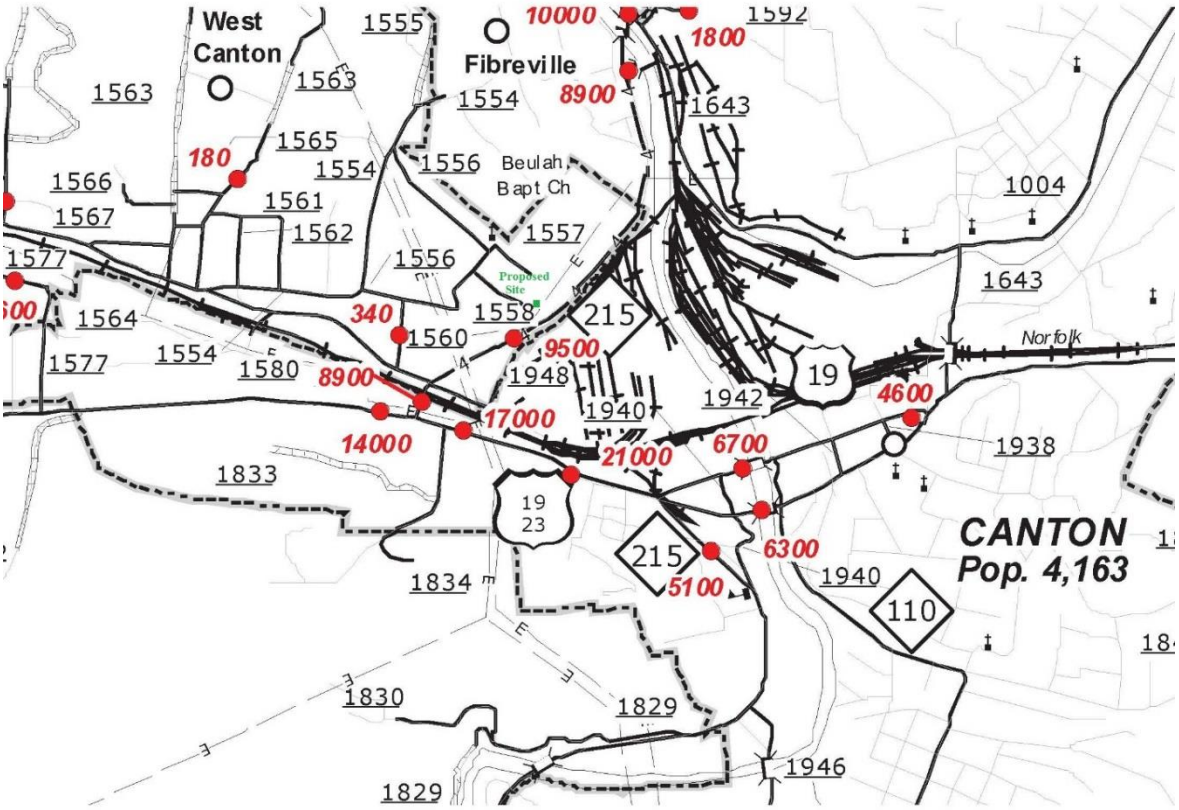


Figure A-135. 2014 Traffic count map for Canton, from NC DOT

The Air Quality System, AQS, identification number and street address for the site is: 37-087-0013 and Pace Street Air Monitor, Evergreen Plant, Canton, North Carolina. The latitude and longitude is 35.534 and -82.853. The sampling and analysis method is AQS code 060, Thermo Electron 43i pulsed fluorescent instrument, EQSA-0486-060, and the operating schedule is hourly. The monitoring objective is source oriented. Figure A-136 shows the location of the monitoring station relative to the population center of Haywood County in the Canton area. Based on the wind roses in Figure A-137 and Figure A-138, the Canton DRR monitoring station is located downwind of the Evergreen Packaging plant. The spatial scale of representativeness for the monitor is middle scale based on the distance of the monitor from the source. The monitor is located approximately 450 meters west of the property line for the facility.

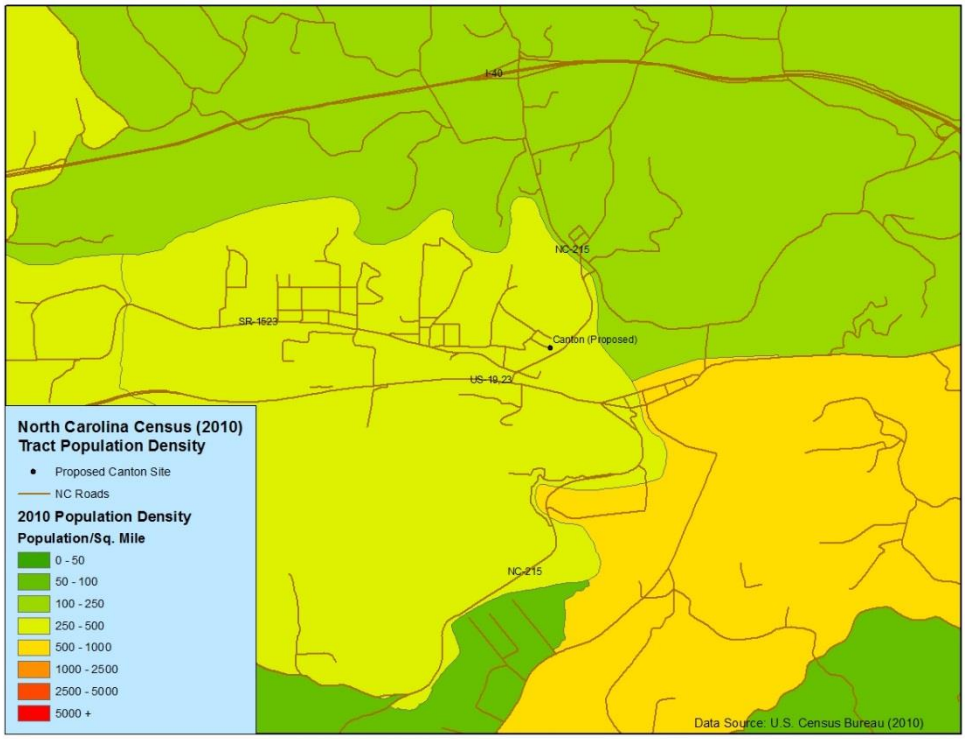


Figure A-136. Location of the Canton DRR monitoring station relative to the population of Canton in Haywood County

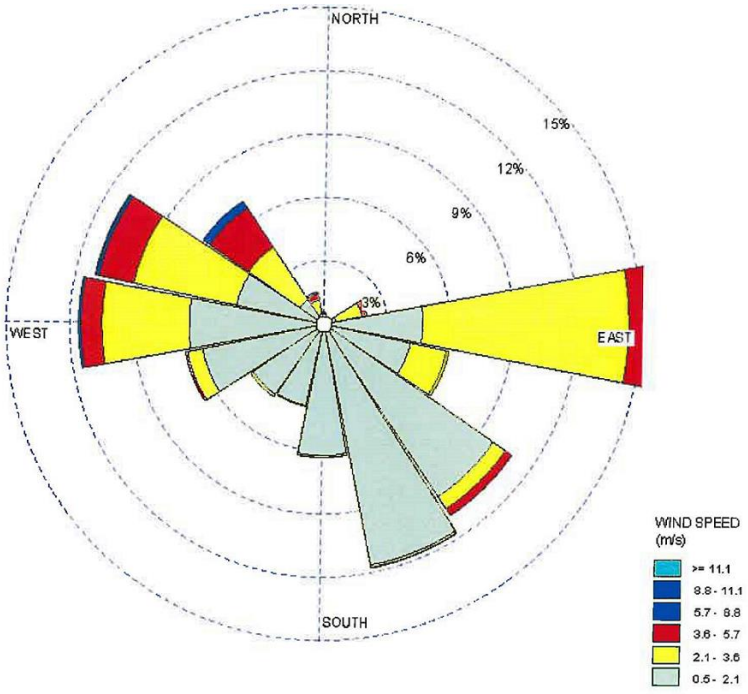


Figure A-137. Wind rose for Canton using 1993 data (from Evergreen Packaging)

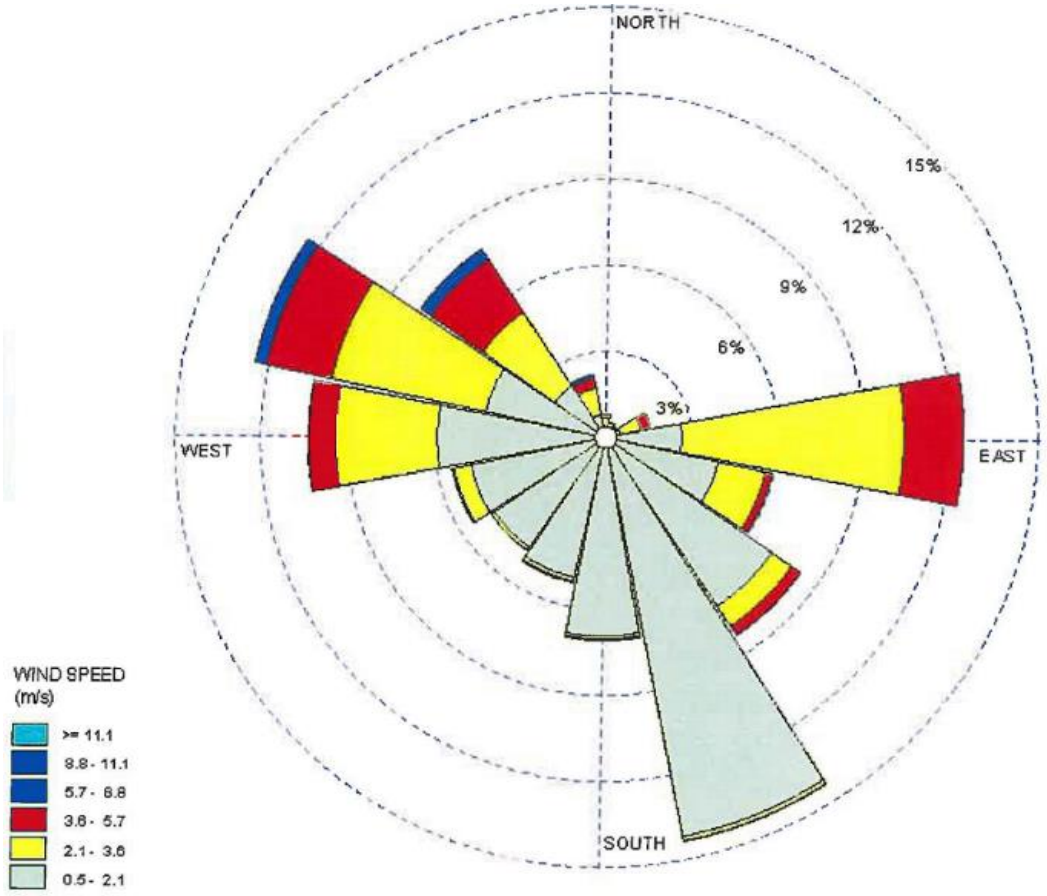


Figure A-138. Canton 2012-2014 wind rose (from Evergreen Packaging)

This monitor is in the Asheville metropolitan statistical area and is representative of the air quality downwind from the fence line of the Evergreen Packaging facility.

The monitoring site was provided to the public for comment during late May to late June 2016 as part of the 2016-2017 network monitoring plan.

Table 11 summarizes other factors DAQ evaluated when choosing the location for the monitoring station.

Table 11. Other considerations in selection of the Canton DRR site

Factor	Evaluation
Long-term Site Commitment	The location is on right-of-way owned by NC DOT and NC DOT does not plan to develop the current area any time in the next three years
Sufficient Operating Space	Potential 20 meter by 20-meter open area free of trees and buildings with no obstructions to the source
Access and Security	The building is inside a fenced area so it is secured from possible vandalism.
Safety	Appropriate electrical permits were obtained.
Power	Overhead powerlines are located 20 meters west of the site.
Environmental Control	The monitoring shelter is placed with the door to the north so that sunlight does not shine in through the window and warm up the building.
Exposure	The monitoring station is at least 10 meters from the driplines of trees and is not near any trees or buildings that could be an obstacle to air flow.
Distance from Nearby Emitters	There are no other permitted facilities within 0.5 miles of the Canton DRR location.
Proximity to Other Measurements	The Canton DRR monitoring station is located about 10 kilometers east of the Waynesville ozone monitoring station.