



**District of Columbia
Regional Haze
State Implementation Plan**

Proposed - July 12, 2019

Submitted to the U.S. Environmental Protection Agency, Region 3

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Executive Summary

Regional haze is defined as “visibility impairment that is caused by the emission of air pollutants from numerous anthropogenic sources located over a wide geographic area. Such sources include, but are not limited to, major and minor stationary sources, mobile sources, and area sources.” (40 CFR 51.301) These emissions are transported over large regions and impact areas that include the District of Columbia (“District”), and national parks, forests, and wilderness areas (“Class I” Federal areas). The Clean Air Act mandates protection of visibility in Class I Federal areas. In 1999, the U.S. Environmental Protection Agency (EPA) finalized the Regional Haze Rule (64 Fed. Reg. 35714, July 1, 1999). The rule calls for state, tribal, and federal agencies to work together to improve visibility in 156 national parks and wilderness areas.

Under the Regional Haze Rule, states are required to develop a series of State Implementation Plans (SIPs) to address visibility impairment in Class I Federal areas and make reasonable progress toward achieving natural visibility conditions. The District’s Regional Haze SIP was approved by the EPA and became effective on March 5, 2012 (77 FR 5191, February 2, 2012). This SIP covered the first implementation period of 2008 – 2018. It was developed based on consultations and work-products of the Mid-Atlantic/Northeast Visibility Union (MANE-VU) Regional Planning Organization (RPO).

Section 308(f) of the 1999 Regional Haze Rule also required each state to submit a revised SIP to EPA by July 31, 2018 and every ten years thereafter; therefore, the end date for this second implementation period is 2028. A 2017 Regional Haze Rule revision extended the SIP submittal date to July 31, 2021, but left the end date for the second implementation period at 2028 (82 Fed. Reg. 3078, January 10, 2017). MANE-VU states have collectively agreed to submit SIPs before the July 31, 2021 deadline.

This SIP revision must establish emissions reduction strategies and interim goals for 2028, reflecting on those strategies as well as trends from various sources including point, area, and mobile (both onroad and nonroad) source emissions, as well as biogenic, wildfire, and agricultural emissions. It encompasses 1) monitoring strategies for evaluating visibility impacts, 2) baselines and trends, and 3) long-term strategy. This SIP also demonstrates that the District has met its long-term strategy obligations for 2028 visibility impairment through on-the-books District and Federal regulations. In addition to extensive consultation with the MANE-VU states, the District consulted with Federal Land Managers (FLMs) responsible for the Class I Federal areas and the EPA in the development of the SIP.

The District will continue to coordinate with other states, FLMs, EPA, MANE-VU, and other RPOs to maintain and improve the visibility in Class I Federal areas. This coordination will include progress reports, SIP revisions, and face-to-face consultation meetings, as necessary.

Section 1 **Background and Overview**

1.1 Introduction

Regional haze is defined as “visibility impairment that is caused by the emission of air pollutants from numerous anthropogenic sources located over a wide geographic area. Such sources include, but are not limited to, major and minor stationary sources, mobile sources, and area sources.” (40 CFR 51.301) These emissions are transported over large regions, including national parks, forests, and wilderness areas (“Class I” federal areas). The Clean Air Act (CAA) mandates protection of visibility in Class I Federal areas.

Fine particles (particles with a diameter less than 2.5 μm - $\text{PM}_{2.5}$) may either be emitted directly or formed from emissions of precursors, the most important of which are sulfur dioxide (SO_2) and nitrogen oxides (NO_x). Particles affect visibility through the scattering and absorption of light, and fine particles - particles similar in size to the wavelength of light - are most efficient, per unit of mass, at reducing visibility. Therefore, reducing fine particles or $\text{PM}_{2.5}$ in the atmosphere is generally considered to be an effective method of reducing regional haze, and thus improving visibility. The most important sources of $\text{PM}_{2.5}$ and its precursors are coal-fired power plants, industrial boilers, and other combustion sources. Other significant contributors to $\text{PM}_{2.5}$ and visibility impairment include mobile source emissions, area sources, fires, and wind-blown dust.

The national goal declared in the CAA Regional Haze Program is to return the visibility condition in our national parks and wilderness areas to their “natural” conditions. The goal of the Regional Haze Program is to make reasonable progress towards natural conditions. Because visibility impairment is caused by the transport of anthropogenically-generated emissions across wide geographic areas and state and local boundaries, the solution to our visibility problem must be developed on a regional and national scale (See Section 1.3 of this SIP).

1.2 Regulatory Development

In 1977, Congress added provisions in the CAA to improve the visibility “in areas of great scenic importance.” These areas have become known as the mandatory Class I Federal Areas and are located in 35 states and one territory (40 CFR 81.401-437). The Class I designation applies to national parks exceeding 6,000 acres, wilderness areas, and national memorial parks exceeding 5,000 acres, and all international parks that were in existence prior to 1977. Class I Federal areas include 156 national parks and wilderness areas (Figure1-1).

Figure 1-1: Mandatory Class I Federal areas



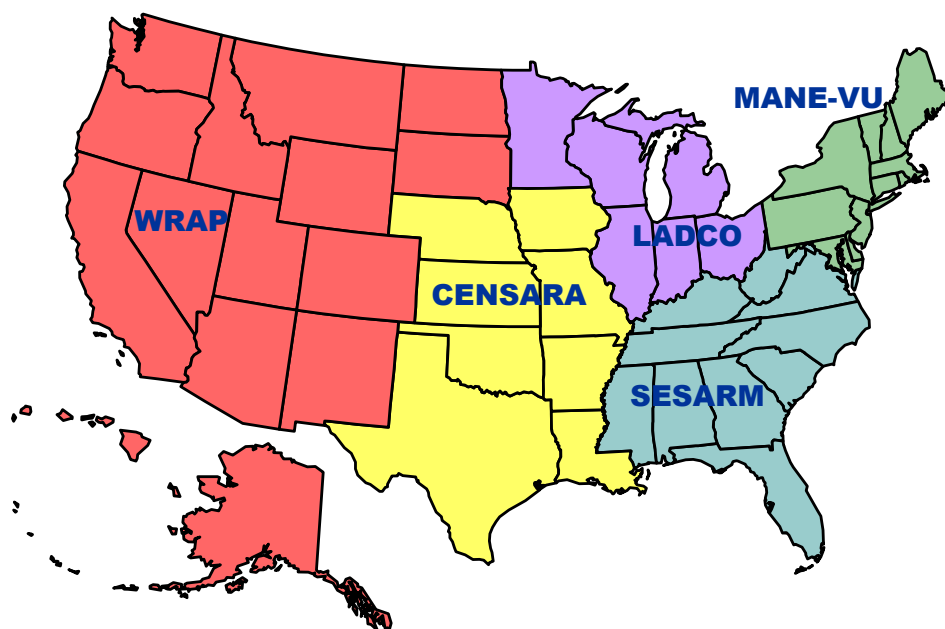
In 1999, EPA published the Regional Haze Rule (64 Fed. Reg. 35714, July 1, 1999) to improve air quality in the Nation’s national parks and wilderness areas. The Rule required all States and the District of Columbia (States) to develop and implement air quality protection plans to reduce the pollution that causes visibility impairment found in the 156 Class I Federal areas, in coordination with EPA, the National Park Service, U.S. Fish and Wildlife Service, the U.S. Forest Service, and other interested parties.

EPA most recently revised the Regional Haze Rule on January 10, 2017 (82 Fed. Reg. 3078, January 10, 2017). This revision clarified the relationship between the long-term strategy and the reasonable progress goals; strengthened the FLM consultation requirements; updated the SIP submittal deadlines for the second planning period to July 31, 2021; adjusted the deadlines for progress report submissions; and removed the requirement for progress reports to take the form of SIP revisions. More details on the history of Regional Haze regulations can be found in the District’s 2008 Regional Haze SIP, Section 1.2.

1.3 Regional Planning Organizations

To aid states in their efforts to develop the technical basis for the states' implementation plans, five multi-state regional planning organizations have been established – Western Regional Air Partnership (WRAP), Central States Air Resources Agencies (CENSARA), Lake Michigan Air Directors Consortium (LADCO), Mid-Atlantic/Northeast Visibility Union (MANE-VU), and Southeastern States Air Resource Managers (SESARM) (Figure 1-2). These organizations provide a forum for state air control administrators to develop regional strategies to address regional haze and to coordinate with other regions. The District is a member of MANE-VU.

Figure 1-2: Map of U.S. Regional Planning Organizations



The Mid-Atlantic Region Air Management Association (MARAMA), the Northeast States for Coordinated Air Use Management (NESCAUM), and the Ozone Transport Commission (OTC) established the Mid-Atlantic/Northeast Visibility Union (MANE-VU) regional planning organization to coordinate efforts to address visibility impairment at seven Class I Federal areas located in the Mid-Atlantic and Northeast corridor:

- Acadia National Park, ME;
- Brigantine Wilderness, NJ;
- Great Gulf Wilderness, NH;
- Lye Brook Wilderness, VT;
- Moosehorn Wilderness, ME;
- Presidential Range – Dry River Wilderness, NH; and



Figure 1-3: MANE-VU and nearby Class I Federal areas

- Roosevelt Campobello International Park, New Brunswick, Canada.

1.4 Required Elements for State Implementation Plan Revisions

The Regional Haze Rule requires each State, as well as the District of Columbia and the Virgin Islands, to develop an implementation plan (SIP) for reducing regional haze. The plan must include goals aimed at improving visibility, and a long-term plan for reducing pollutant emissions that contribute to visibility degradation.

The Regional Haze Rule focuses on developing long-term strategies that are based on reasonably determined controls in states that are reasonably anticipated to impact visibility at Class I Federal areas and encourages States to coordinate with each other through regional planning efforts. The core areas to be addressed in this SIP revision are codified at 40 CFR 51.308(f) – (i).

1.5 Area of Influence for MANE-VU Class I Federal Areas

The key differences between SIPs from States with Class I Federal areas and States without Class I Federal areas are the calculation of the baseline and natural visibility for their Class I Federal areas and the determination of reasonable progress goals. Class I States calculate baseline visibility conditions for the period between 2000 and 2004. The average impairment for the most and least impaired days are determined for each calendar year and compiled into the average of the five annual averages (40 CFR 51.308 (f)(1)(i)). The natural visibility conditions for the most and least impaired days are calculated by estimating the average deciview index based on available monitoring data and appropriate data analysis technique (40 CFR 51.308 (f)(1)(ii)). In contrast, States without Class I Federal areas are responsible for establishing a Long-term Strategy so that the Class I Federal areas affected by emissions from the state can make reasonable progress towards natural conditions.

The District does not have a Class I Federal area located within its borders. As a result, the Regional Haze Rule requires the District, in consultation with MANE-VU and others, to identify where its emissions are most likely to influence visibility in Class I Federal areas. For the second implementation period, in order to identify states whose emissions are most likely to influence visibility in MANE-VU Class I Federal areas, MANE-VU prepared the *Selection of States for MANE-VU Regional Haze Consultation (2018)* (Appendix 1). As detailed within the report, MANE-VU initiated a process of screening states and sectors for contribution using two tools- Q/d and CALPUFF.

During the first implementation period the District was not found to significantly impact any Class I Federal area inside or outside of MANE-VU. Modeling indicated that the District contributed less than one-tenth of one percent (0.1%) of the anthropogenic visibility impairment from Eastern US States to any Class I Federal area within 300 kilometers (km). For the second implementation period, MANE-VU's analysis estimated contribution of less than or equal to 0.13% of the anthropogenic visibility impairment from Eastern US States (see Section 2.4.3). Even with only minor impacts, the District continues to participate in the consultation process as part of MANE-VU.

1.6 What are Long-term Strategies?

Another core component of the SIP is to develop a long-term strategy that includes enforceable emissions limitations, compliance schedules, and other measures necessary to make reasonable progress in affected Class I Federal areas. Long-term Strategies extend through an entire ten-year planning period for the Regional Haze program, which in this case extends to 2028. States without Class I Federal areas but with sources identified to “affect” another State’s Class I Federal area must consult with that State in order to develop coordinated emission management strategies containing the emission reductions necessary to make reasonable progress.

1.7 What are Reasonable Progress Goals?

Reasonable Progress Goals must be set based on Long-term Strategies that consider certain statutory factors established by Congress that include the costs of compliance, time needed for compliance, and energy and non-air quality environmental impacts along with the remaining useful life of any potentially affected sources. For each Class I Federal area located within a State, the Class I State must establish goals (expressed in deciviews) that reflect the visibility conditions projected to be achieved as a result of the State’s own long-term strategy, other States’ long-term strategies, and other emission reduction programs.

1.8 Periodic Updates and Revisions to SIPs

Other details to be discussed in this SIP include the process to submit periodic plan revisions to EPA every ten years, with the next revision due by 2028. In addition to submitting plan revisions every ten years, the District will commit to evaluate and report progress towards the reasonable progress goals established for each Class I Federal area located outside the District, which may be affected by emissions from within the District. These progress reports were to be submitted every five years to EPA, but in the 2017 Regional Haze Rule, EPA changed the due date of the next progress report to January 31, 2025.

Section 2 Compliance with Federal Regional Haze Program Requirements

This section will demonstrate the authority of the District government to implement the Regional Haze program and that the District is undertaking measures deemed to be reasonable to complete by the end of the 2028 planning period in order for downwind Class I Federal areas to achieve natural visibility condition on the most impaired days by 2064 and maintain visibility conditions on the clearest days.

2.1 § 51.308 (f) – Second Planning Period Requirements

Requirements for periodic comprehensive revisions of implementation plans for regional haze. Each State identified in § 51.300(b) must revise and submit its regional haze implementation plan revision to EPA by July 31, 2021, July 31, 2028, and every 10 years thereafter. The plan revision due on or before July 31, 2021, must include a commitment by the State to meet the requirements of paragraph (g) of this section. In each plan revision, the State must address regional haze in each mandatory Class I Federal area located within the State and in each mandatory Class I Federal area located outside the State that may be affected by emissions from within the State. To meet the core requirements for regional haze for these areas, the State must submit an implementation plan containing the following plan elements and supporting documentation for all required analyses

The District commits to submitting plan revisions to EPA by July 31, 2021; July 31, 2028; and every 10 years thereafter to meet the requirements of § 51.308 (g).

2.2 § 51.308 (f)(1) – Visibility Condition Calculations

Calculations of baseline, current, and natural visibility conditions; progress to date; and the uniform rate of progress. For each mandatory Class I Federal area located within the State, the State must determine the following...

The District does not have any Class I Federal areas located within its borders and thus is not required to comply with § 51.308 (f)(1) or any of its subsections.

2.3 § 51.308 (f)(2) – Long-term Strategy

Long-term strategy for regional haze. Each State must submit a long-term strategy that addresses regional haze visibility impairment for each mandatory Class I Federal area within the State and for each mandatory Class I Federal area located outside the State that may be affected by emissions from the State. The long-term strategy must include the enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress, as determined pursuant to (f)(2)(i) through (iv). In establishing its long-term strategy for regional haze, the State must meet the following requirements...

The District does not have any Class I Federal areas within its borders so it only must address in its long-term strategy sources that affect Class I Federal areas located outside of the District. In Section 2.4 the District will demonstrate that it does not contain sources which are reasonably

anticipated to contribute to visibility impairment at any mandatory Class I Federal areas outside of the District and thus no emission reduction measures are necessary to implement as part of a long-term strategy in order for upwind Class I Federal areas to make reasonable progress.

40 CFR § 51.308(f)(2) requires the District to ensure that its long-term strategy includes the enforceable emission limitations, compliance schedules, and other measures necessary to make reasonable progress. The District's long-term strategy for the second implementation period does not include any emission control measures that are not already part of the EPA-approved SIP, and therefore no new enforceable emission limitations, compliance schedules, or other measures are needed in this SIP submission.

2.4 § 51.308 (f)(2)(i) – Determination of Effecting Sources and Evaluation of Four Factors

The State must evaluate and determine the emission reduction measures that are necessary to make reasonable progress by considering the costs of compliance, the time necessary for compliance, the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any potentially affected anthropogenic source of visibility impairment. The State should consider evaluating major and minor stationary sources or groups of sources, mobile sources, and area sources. The State must include in its implementation plan a description of the criteria it used to determine which sources or groups of sources it evaluated and how the four factors were taken into consideration in selecting the measures for inclusion in its long-term strategy. In considering the time necessary for compliance, if the State concludes that a control measure cannot reasonably be installed and become operational until after the end of the implementation period, the State may not consider this fact in determining whether the measure is necessary to make reasonable progress.

The long-term strategy as outlined in 40 CFR § 51.308(f)(2) is the basis for the control of emissions that impair visibility in Class I Federal areas. Four factors are analyzed for sources to determine what control measures may be reasonable for implementation during the implementation period. The Regional Haze Rule provides several insights as to how to determine what sources need to be analyzed in development of a long-term strategy.

40 CFR § 51.308(f)(2) requires States to submit a long-term strategy that addresses regional haze visibility impairment for each mandatory Class I Federal area within and outside the State which “may be affected by emissions from the State.” 40 CFR § 51.308(f)(2)(ii) also requires States with Class I Federal areas to consult with any upwind State that is “reasonably anticipated to contribute to visibility impairment” at the Class I Federal area. These requirements make it clear that the long-term strategy is not to be based on all sources within a State, but only those that have an effect on visibility impairment at a Class I Federal area. The District will demonstrate that no such sources are under its jurisdiction.

2.4.1 First Implementation Period

During the first implementation period, modeling indicated that the District contributed less than one-tenth of one percent (0.1%) of all of the modeled Eastern U.S. anthropogenic visibility impairment to any of the five Class I Federal areas that are within 300 km of the District. During

the first planning period MANE-VU considered 1% as the threshold for a state to be “reasonably anticipated to contribute to visibility impairment.” It was also implied that the District was not “reasonably anticipated to contribute to visibility impairment” to Class I Federal areas in Virginia or West Virginia since neither state asked for the District to participate in consultation.

2.4.2 Examination of Monitored Data

For the second implementation period, MANE-VU began by updating its conceptual model of regional haze in *Contributions to Regional Haze in the Northeast and Mid-Atlantic United States: Preliminary Update Through 2007* (NESCAUM, March 2012) (Appendix 2). The monitored Class I Federal areas within MANE-VU and within 300 km were considered. The research of IMPROVE monitor data at the MANE-VU and nearby Class I Federal areas¹ concluded that the sulfates from SO₂ emissions were still the primary driver behind visibility impairment in the region, though nitrates from NO_x emission sources play a more significant role than they had in the first planning period, in particular at Brigantine, New Jersey.

Analysis of IMPROVE data continued so as to factor in the change in metrics from 20% worst days to 20% most impaired days that 51.308 now requires to be used. This analysis is found in the report *Mid-Atlantic/Northeast U.S. Visibility Data 2004-2017 (2nd RH SIP Metrics)* (MANE-VU, December 2018) (Appendix 3). Figure 2-1 illustrates that using the 20% most impaired visibility days shows the dominance of sulfate in the extinction calculated from the 2000-2004 baseline data, how much that has decreased by the 2013-2017 period, how it is still the primary contributor to extinction at the Class I Federal areas within 300 km of the District, and how nitrates are now a major contributor at the Brigantine site. MANE-VU also added data from James River Face IMPROVE monitor into consideration as part of this analysis. This more recent data showing the importance of sulfates primarily, and nitrates at certain sites, supports the assumptions concerning pollutants of interest laid out in *Contributions to Regional Haze in the Northeast and Mid-Atlantic United States: Preliminary Update Through 2007* (NESCAUM, March 2012) (Appendix 2).

¹ Acadia National Park, Brigantine Wilderness, Great Gulf Wilderness, Lye Brook Wilderness, Moosehorn Wilderness, Dolly Sods Wilderness and Shenandoah National Park. Note that at this stage in the analysis James River Face was not included, but it was added into consideration at a later point.

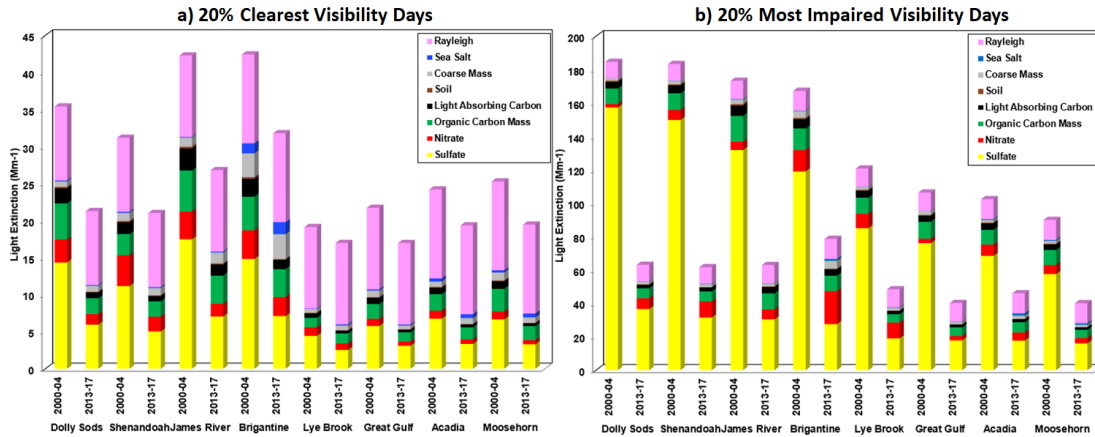


Figure 2-1: Current and Baseline 5-Year Average Light Extinction at Class I Sites on 20 Percent Clearest and 20 Percent Most Impaired Visibility Days

Following the determination of the anthropogenic pollutants that impair visibility in the MANE-VU and nearby Class I Federal areas, MANE-VU conducted several contribution analyses.

2.4.3 Contribution Modeling Techniques Used

The District relied on contribution assessments conducted by MANE-VU to determine whether emissions from the District affected downwind Class I Federal areas. Two contribution assessments were completed by MANE-VU- a meteorologically weighted Q/d analysis and a CALPUFF modeling analysis. The following sections provide details on the analyses and demonstrate that the District is not “reasonably anticipated to contribute to visibility impairment” in any Class I Federal area.

Meteorologically Weighted Q/d

The meteorologically weighted emissions over distance (Q/d) method is a method for estimating sulfate and nitrate contributions to a receptor. NESCAUM employed this method for the first implementation period in the *Contribution Assessment and the Mid-Atlantic United States and the Contributions to Regional Haze in the Northeast and Mid-Atlantic United States: Preliminary Update Through 2007* (Appendix 2). The 2016 assessment for the second implementation period primarily uses the same methodology as in this previous study.

The empirical formula that relates emission source strength and estimated impact is expressed through the following equation:

$$I = C_i(Q/d)$$

In this equation, the strength of an emission source, Q, is linearly related to the impact, I, that it will have on a receptor located a distance, d, away. As in the previous analysis, distances were computed using the Haversine function, using an earth radius of 6371 km. The effect of meteorological prevailing winds can be factored into this approach by establishing the constant, C_i , as a function of the “wind direction sectors” relative to the receptor site.

The emissions employed in the Q/d assessment used both the 2011 emissions that were selected based on the description in Section 2.6, as well as projections to 2018. Details of the meteorologically weighted Q/d analyses can be found in *MANE-VU Updated Q/d*C Contribution Assessment* (MANE-VU, April 2016) (Appendix 3).

32 eastern States were analyzed and the list of states included was based on prior inclusion of the State in an interstate Federal cap-and-trade program under CAA § 110(a)(2)(d). The MANE-VU meteorologically weighted Q/d work found that the District contributed between 0.02% and 0.07% to visibility impairment at any of the Class I Federal areas within 300 km of the District in 2011 and was projected to contribute between 0.04% and 0.13% to visibility impairment at any of the Class I Federal areas within 300 km of the District in 2018 based on the maximum daily impact. During this planning period MANE-VU, through the intra-RPO consultation, considered 2% to be the threshold for a state to be “reasonably anticipated to contribute to visibility impairment.” The District is well below that 2% threshold and even the 1% threshold used during the first planning period, thus the District is not “reasonably anticipated to contribute to visibility impairment” in any Class I Federal area. Detailed results for each of the 32 States considered are in Table 2-1.

Table 2-1: Q/d results using 2011 and 2018 inventory data for 32 states

	MANE-VU										SESARM						
	Acadia		Brigantine		Great Gulf		Lye Brook		Moosehorn		Dolly Sods		James River Face		Shenandoah		
	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	
2011																	
AL	3.20%	10	3.49%	12	2.98%	11	3.37%	11	2.84%	11	2.85%	11	3.88%	11	3.15%	13	
AR	1.02%	24	1.00%	23	1.18%	22	1.04%	21	1.19%	23	0.79%	21	0.99%	20	0.84%	21	
CT	0.08%	29	0.05%	30	0.02%	32	0.05%	29	0.06%	29	0.01%	30	0.01%	30	0.02%	30	
DC	0.03%	32	0.07%	29	0.02%	30	0.02%	30	0.02%	31	0.02%	29	0.02%	29	0.05%	29	
DE	0.44%	27	1.85%	19	0.14%	27	0.20%	26	0.36%	26	0.18%	26	0.25%	25	0.37%	24	
GA	3.58%	9	3.73%	8	2.94%	12	2.76%	12	3.03%	10	3.01%	10	4.40%	7	3.53%	12	
IA	2.14%	18	1.22%	22	2.39%	14	1.76%	18	1.89%	16	1.20%	18	1.38%	18	1.25%	19	
IL	5.27%	5	3.65%	9	6.11%	5	4.63%	8	6.38%	5	3.73%	7	4.33%	8	3.79%	8	
IN	8.34%	3	7.15%	3	10.22%	3	7.94%	3	9.43%	3	7.55%	4	8.73%	2	7.43%	3	
KY	4.40%	7	5.71%	4	4.81%	7	5.03%	6	4.97%	8	5.74%	5	7.20%	4	5.61%	5	
LA	1.96%	20	1.91%	17	1.79%	16	1.97%	15	1.75%	17	1.41%	17	1.82%	16	1.56%	18	
MA	2.04%	19	0.71%	24	0.54%	24	0.51%	25	0.75%	24	0.24%	24	0.26%	24	0.33%	25	
MD	1.78%	22	4.32%	6	1.65%	17	1.84%	16	1.65%	18	4.09%	6	1.94%	15	3.53%	11	
ME	1.60%	23	0.09%	28	0.28%	25	0.07%	28	1.39%	21	0.04%	28	0.05%	28	0.06%	28	
MI	7.01%	4	3.52%	11	7.95%	4	6.93%	4	7.65%	4	3.59%	8	3.29%	13	4.38%	6	
MN	0.77%	25	0.34%	27	0.21%	26	0.78%	22	0.22%	28	0.40%	23	0.35%	23	0.47%	23	
MO	4.17%	8	3.08%	13	4.75%	8	3.55%	9	5.20%	7	2.73%	13	3.28%	14	2.85%	15	
MS	0.66%	26	0.67%	25	0.60%	23	0.67%	24	0.58%	25	0.51%	22	0.67%	22	0.56%	22	
NC	2.32%	17	2.88%	14	1.43%	19	1.47%	19	1.52%	19	1.70%	15	3.73%	12	3.63%	9	
NH	2.40%	15	0.55%	26	1.25%	21	0.68%	23	2.10%	14	0.22%	25	0.23%	26	0.29%	26	
NJ	0.30%	28	1.90%	18	0.12%	28	0.16%	27	0.24%	27	0.11%	27	0.11%	27	0.17%	27	
NY	3.13%	11	1.81%	20	4.02%	9	5.10%	5	3.15%	9	0.95%	20	0.87%	21	1.14%	20	
OH	15.26%	1	16.85%	1	16.62%	1	17.78%	1	16.97%	1	25.01%	1	21.77%	1	21.63%	1	
PA	10.79%	2	14.91%	2	11.81%	2	15.30%	2	10.82%	2	12.86%	2	8.56%	3	12.54%	2	
RI	0.08%	30	0.03%	31	0.02%	31	0.02%	32	0.02%	32	0.01%	31	0.01%	31	0.01%	31	
SC	1.85%	21	2.11%	16	1.37%	20	1.17%	20	1.36%	22	1.07%	19	1.80%	17	2.06%	16	
TN	2.39%	16	2.84%	15	2.29%	15	2.66%	13	2.07%	15	2.83%	12	4.06%	10	2.99%	14	
TX	5.01%	6	4.52%	5	4.99%	6	4.81%	7	5.89%	6	3.26%	9	4.08%	9	3.57%	10	
VA	2.50%	14	4.22%	7	1.56%	18	1.80%	17	1.44%	20	2.40%	14	5.69%	5	4.32%	7	
VT	0.03%	31	0.01%	32	0.06%	29	0.02%	31	0.03%	30	0.00%	32	0.00%	32	0.00%	32	
WI	2.85%	12	1.24%	21	3.19%	10	2.51%	14	2.27%	13	1.46%	16	1.22%	19	1.68%	17	
WV	2.60%	13	3.59%	10	2.67%	13	3.39%	10	2.79%	12	10.02%	3	3.88%	6	6.18%	4	

	MANE-VU										SESARM							
	Acadia		Brigantine		Great Gulf		Lye Brook		Moosehorn		Dolly Sods		James River Face		Shenandoah			
	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank		
2018																		
AL	2.22%	15	2.29%	15	1.97%	15	2.27%	14	1.75%	16	1.91%	16	2.66%	15	2.13%	16		
AR	2.62%	14	2.46%	13	2.97%	12	2.64%	13	2.94%	12	2.02%	13	2.61%	16	2.19%	15		
CT	0.13%	30	0.08%	29	0.03%	32	0.08%	28	0.09%	29	0.02%	30	0.02%	30	0.03%	30		
DC	0.06%	32	0.13%	28	0.05%	30	0.05%	30	0.05%	31	0.04%	28	0.05%	28	0.11%	28		
DE	0.29%	28	1.20%	22	0.16%	28	0.13%	27	0.23%	28	0.13%	25	0.16%	25	0.25%	25		
GA	1.37%	21	1.40%	21	1.10%	21	1.08%	22	1.08%	21	1.06%	19	1.58%	18	1.38%	18		
IA	1.35%	22	0.75%	23	1.47%	18	1.11%	20	1.20%	20	0.79%	21	0.93%	21	0.82%	22		
IL	5.42%	7	3.83%	9	6.17%	7	4.77%	8	6.34%	6	3.95%	9	4.78%	10	4.07%	10		
IN	7.46%	5	6.26%	6	8.79%	4	6.95%	4	8.06%	5	6.45%	5	7.68%	3	6.47%	6		
KY	5.20%	8	6.27%	5	5.96%	8	5.81%	7	5.70%	8	6.02%	6	7.59%	5	6.05%	7		
LA	2.96%	12	2.77%	11	2.62%	13	2.95%	12	2.49%	13	2.13%	12	2.82%	14	2.38%	14		
MA	0.80%	26	0.25%	26	0.22%	27	0.24%	26	0.37%	26	0.09%	26	0.10%	26	0.12%	26		
MD	3.77%	9	8.89%	3	3.36%	11	3.80%	11	3.35%	11	8.39%	4	4.17%	11	7.46%	4		
ME	1.25%	23	0.07%	30	0.22%	25	0.05%	29	1.39%	18	0.03%	29	0.04%	29	0.04%	29		
MI	6.02%	6	2.66%	12	6.44%	6	5.95%	6	6.32%	7	2.97%	10	2.83%	13	3.47%	11		
MN	1.08%	24	0.46%	25	0.30%	24	1.09%	21	0.30%	27	0.56%	23	0.49%	23	0.66%	23		
MO	7.50%	4	5.37%	7	8.37%	5	6.38%	5	9.04%	4	4.96%	8	6.16%	7	5.24%	8		
MS	1.58%	18	1.55%	20	1.41%	19	1.60%	18	1.35%	19	1.22%	17	1.66%	17	1.37%	19		
NC	2.64%	13	3.24%	10	1.74%	17	1.68%	17	1.89%	15	1.98%	14	5.02%	9	4.39%	9		
NH	0.99%	25	0.20%	27	0.73%	23	0.25%	25	0.77%	24	0.08%	27	0.09%	27	0.11%	27		
NJ	0.49%	27	1.83%	18	0.22%	26	0.27%	24	0.38%	25	0.18%	24	0.19%	24	0.27%	24		
NY	3.35%	11	1.98%	17	3.71%	9	4.46%	10	3.37%	10	1.08%	18	1.01%	20	1.29%	20		
OH	10.16%	2	10.22%	2	11.07%	2	11.33%	2	10.93%	2	13.94%	2	13.20%	1	12.82%	2		
PA	11.57%	1	16.36%	1	12.27%	1	15.74%	1	10.94%	1	13.65%	3	9.50%	2	13.71%	1		
RI	0.16%	29	0.05%	31	0.04%	31	0.03%	32	0.03%	32	0.02%	31	0.02%	31	0.03%	31		
SC	1.47%	19	1.64%	19	1.03%	22	0.91%	23	0.98%	23	0.72%	22	1.29%	19	1.67%	17		
TN	2.01%	16	2.24%	16	1.86%	16	2.19%	15	2.15%	14	2.23%	11	3.17%	12	2.38%	13		
TX	9.17%	3	7.90%	4	9.00%	3	8.66%	3	10.47%	3	5.91%	7	7.61%	4	6.55%	5		
VA	1.46%	20	2.35%	14	1.16%	20	1.31%	19	1.00%	22	1.96%	15	5.45%	8	2.92%	12		
VT	0.07%	31	0.02%	32	0.13%	29	0.04%	31	0.07%	30	0.01%	32	0.01%	32	0.01%	32		
WI	1.93%	17	0.74%	24	2.00%	14	1.69%	16	1.45%	17	0.86%	20	0.79%	22	1.13%	21		
WV	3.46%	10	4.54%	8	3.45%	10	4.48%	9	3.54%	9	14.63%	1	6.32%	6	8.48%	3		

CALPUFF Modeling

Following completion of the meteorologically weighted Q/d assessment, the New Hampshire Department of Environmental Services (NHDES) in conjunction with the Vermont Department of Environmental Conservation (VTDEC) carried out air pollution transport modeling with the CALPUFF dispersion model, which was used to simulate sulfate and nitrate formation and transport in MANE-VU and nearby regions. The modeling effort focused on Electrical Generating Units (EGUs) and large industrial and institutional sources in the eastern and central United States. However, the District has no EGUs as demonstrated in Section 2.7.3, no industrial sources that were found to emit enough emissions to affect Class I Federal areas, nor has emissions as a whole that were “reasonably anticipated to contribute to visibility impairment” at the 2% threshold. As a result, MANE-VU states did not include District sources in this second step of point source modeling analysis. Details on the modeling are found in the report *2016 MANE-VU Source Contribution Modeling Report – CALPUFF Modeling of Large Electrical Generating Units and Industrial Sources* (MANE-VU, April 2017) (Appendix 4).

2.5 § 51.308 (f)(2)(ii) – State-to-State Consultation

The State must consult with those States that have emissions that are reasonably anticipated to contribute to visibility impairment in the mandatory Class I Federal area

to develop coordinated emission management strategies containing the emission reductions necessary to make reasonable progress.

(A) The State must demonstrate that it has included in its implementation plan all measures agreed to during state-to-state consultations or a regional planning process, or measures that will provide equivalent visibility improvement.

(B) The State must consider the emission reduction measures identified by other States for their sources as being necessary to make reasonable progress in the mandatory Class I Federal area.

(C) In any situation in which a State cannot agree with another State on the emission reduction measures necessary to make reasonable progress in a mandatory Class I Federal area, the State must describe the actions taken to resolve the disagreement. In reviewing the State's implementation plan, the Administrator will take this information into account in determining whether the plan provides for reasonable progress at each mandatory Class I Federal area that is located in the State or that may be affected by emissions from the State. All substantive interstate consultations must be documented.

In 1999, EPA and affected States/Tribes established five Regional Planning Organizations (RPOs) to facilitate interstate coordination on their SIPs. The District of Columbia is a member of the Mid-Atlantic / Northeast Visibility Union (MANE-VU) RPO. Members of MANE –VU are listed in Table 2-2.

Table 2-2: MANE-VU Members

Connecticut	Pennsylvania
Delaware	Penobscot Nation
District of Columbia	Rhode Island
Maine	St. Regis Mohawk Tribe
Maryland	Vermont
Massachusetts	U.S. Environmental Protection Agency*
New Hampshire	U.S. National Park Service*
New Jersey	U.S. Fish and Wildlife Service*
New York	U.S. Forest Service*

*Non-voting members

MANE-VU's work is managed by the Ozone Transport Commission (OTC) and carried out by OTC, the Mid-Atlantic Regional Air Management Association (MARAMA), and the Northeast States for Coordinated Air Quality Management (NESCAUM). The states along with federal agencies and professional staff from OTC, MARAMA, and NESCAUM are members of the various committees and workgroups.

Since its inception on July 24, 2001, MANE-VU established a committee structure that met regularly to address both technical and non-technical issues related to regional haze. The primary committee is the Technical Support Committee (TSC). The TSC is charged with assessing the nature and magnitude of the regional haze problem within MANE-VU, interpreting the results of technical work, and reporting on such work to MANE-VU.

The District is not reasonably anticipated to contribute to visibility impairment in any Class I Federal area, either inside or outside of MANE-VU. However, the District consulted with other States by participation in the MANE-VU and inter-RPO processes that developed technical information necessary for development of coordinated strategies. A full documentation of this consultation is available in *MANE-VU Regional Haze Consultation Summary* (MANE-VU, August 2018) (Appendix 5). To date the District has not been invited to consult with states outside of MANE-VU.

On May 10, 2006, MANE-VU adopted the Inter-RPO State/Tribal and FLM Consultation Framework, which set forth basic principles for the consultation process (Appendix 5) for the first implementation period. On May 5, 2017, MANE-VU adopted an updated consultation plan, *MANE-VU Regional Haze Consultation Plan* (May 5, 2017) (Appendix 6), which summarized the consultation process for the second implementation period.

MANE-VU facilitated the consultation process in two phases (as shown in Table 2-3):

1. Intra-RPO Consultation among MANE-VU members (states, tribes, EPA and FLMs) and
2. Inter-RPO Consultation between MANE-VU members and non-MANE-VU states.

Table 2-3: Schedule of MANE-VU Intra- and Inter-RPO Consultation

Date	Call/Meeting	Consultation Step	Type
February 7, 2017	Air Directors Call	Introduction to Process & Planning	
February 28, 2017	TSC Call	<u>MANE-VU Intra-RPO Consultation #1</u>	Technical
March 7, 2017	Air Directors Call	Update	
March 28, 2017	TSC Call	<u>MANE-VU Intra-RPO Consultation #2</u>	Technical
April 11, 2017	TSC Meeting	<u>MANE-VU Intra-RPO Consultation #3</u>	Technical
April 21, 2017	FLM Call	<u>MANE-VU Intra-RPO Consultation #4</u>	Technical
April 25, 2017	TSC Call	<u>MANE-VU Intra-RPO Consultation #5</u>	Technical
May 9-11, 2017	Air Directors Meeting	<u>MANE-VU Intra-RPO Consultation #6</u>	Policy
May 30, 2017	TSC Call	<u>MANE-VU Intra-RPO Consultation #6b</u>	Technical
June 5, 2017	Annual Meeting Caucus	<u>MANE-VU Intra-RPO Consultation #7</u>	Policy
June 16, 2017	Air Directors Call	<u>MANE-VU Intra-RPO Consultation #8</u>	Policy
June 29, 2017	Commissioners Call	<u>Briefing</u>	
July 25, 2017	Commissioners Call	<u>MANE-VU Intra-RPO Consultation #9</u>	Policy
August 4, 2017	Air Directors Call	<u>MANE-VU Intra-RPO Consultation #10</u>	Policy
August 9, 2017	Air Directors Call	<u>MANE-VU Intra-RPO Consultation #11</u>	Policy
September 7, 2017	TSC Meeting	Update	
October 20, 2017	Technical/Air Directors Call	<u>MANE-VU Inter-RPO Consultation #1</u>	Technical
December 1, 2017	Technical/Air Directors/FLM Call	<u>MANE-VU Inter-RPO Consultation #2</u>	Technical
December 18, 2017	Technical/Air Directors Call	<u>MANE-VU Inter-RPO Consultation #3</u>	Technical
January 12, 2018	Technical/Air Directors Call	<u>MANE-VU Inter-RPO Consultation #4</u>	Technical
March 28, 2018	Commissioners Call	<u>MANE-VU Inter-RPO Consultation #5</u>	Policy

A detailed description of the consultation process meetings and calls can be found in the *MANE-VU Regional Haze Consultation Summary* (MANE-VU, August 2018) (Appendix 7).

On August 25, 2017, MANE-VU signed statement containing six “Asks” concerning controls and analyses that the States with Class I Federal areas in MANE-VU wanted to be addressed in the long-term strategy of any MANE-VU member (Appendix 8). Though contribution

assessments conducted by MANE-VU show that the District is not reasonably anticipated to contribute to visibility impairment at any MANE-VU Class I Federal area, the District participated in the inter-RPO consultation and has chosen to address the MANE-VU “Asks” in its implementation plan.

Additionally, as a non-voting member of MANE-VU, the National Park Service (NPS) sent a letter on April 12, 2018 to MANE-VU requesting that MANE-VU states consider specific individual sources in their long-term strategies (Appendix 9). NPS used an analysis of 2014 emissions divided by distance (Q/d) to estimate the impact of MANE-VU facilities on NPS Class I Federal areas - Acadia, Mammoth Cave, and Shenandoah National Parks. The letter states that the NPS used the following technique:

EPA’s draft guidance allows use of emissions divided by distance (Q/d) as a surrogate for a modeling analysis to estimate impact. We first summed 2014 NEI NOx + PM10 + SO2 + SO4 at a given facility and divided by distance to a specified NPS Class I Federal area. Airports and rail yards were deleted because these mobile sources are not regulated by states. For EGUs with significant Q/d values, we used 2017 CAM [sic] data to adjust for changes in emissions since 2014. We also deleted facilities that either had shut down since 2014 or had committed to shut down during the next planning period. To estimate the impact of MANE-VU facilities, we summed the Q/d values across all MANE-VU states relative to ACAD, MACA, and SHEN, ranked the Q/d values relative to each Class I Federal area, created a running total, and identified those facilities contributing to 80% of the total impact at each NPS Class I Federal area. We applied a similar process to facilities in ME relative to ACAD. We merged the resulting lists of facilities and sorted them by their states. Although the numbers of facilities identified for most states were not excessive, we observed that the totals for NY and PA could be considered burdensome. To address this problem, we suggest that a state consider those facilities comprising 80% of the Q/d total, not to exceed the 25 top ranked facilities.

The NPS analysis identified one facility in the District, as shown below.

EIS ID	Facility	Q	Distance to NPS Class I Federal area	Q/d	NPS Class I Federal area
2701211	U.S. GSA Central Heating and Refrigeration Plant	258	101 km	2.5	Shenandoah

However, this analysis did not consider meteorological factors such as prevailing wind direction. Contribution assessments conducted by MANE-VU discussed in Section 2.4.3, which do consider meteorology, show that the District is not reasonably anticipated to contribute to visibility impairment at Shenandoah National Park. The District has chosen to address the feedback from the National Park Service in its implementation plan despite its disagreement with the conclusion that the U.S. GSA Central Heating and Refrigeration Plant is reasonably anticipated to impair visibility at Shenandoah National Park.

How the District addressed the six MANE-VU “Asks” and the National Park Service letter is discussed in the following sections.

2.5.1 “Ask 1” – Running NO_x Post-Combustion Controls on Coal-Fired EGUs Year-Round

Electric Generating Units (EGUs) with a nameplate capacity larger than or equal to 25MW with already installed NO_x and/or SO₂ controls - ensure the most effective use of control technologies on a year-round basis to consistently minimize emissions of haze precursors, or obtain equivalent alternative emission reductions;

The District has no coal-fired EGUs with a nameplate capacity greater than 25 MW so the District is currently meeting “Ask 1.”

2.5.2 “Ask 2” – Sources with an Impact of 3 Mm⁻¹ or More on MANE-VU Class I Federal areas

Emission sources modeled by MANE-VU that have the potential for 3.0 Mm⁻¹ or greater visibility impacts at any MANE-VU Class I Federal area, as identified by MANE-VU contribution analyses (see attached listing) - perform a four-factor analysis for reasonable installation or upgrade to emission controls;

The District has no facilities modeled by MANE-VU to impact visibility at any Class I Federal area by 3.0 Mm⁻¹ or more so the District is currently meeting “Ask 2.”

2.5.3 “Ask 3” – Ultra Low-Sulfur Fuel Oil Regulations

Each MANE-VU State that has not yet fully adopted an ultra-low sulfur fuel oil standard as requested by MANE-VU in 2007 - pursue this standard as expeditiously as possible and before 2028, depending on supply availability, where the standards are as follows:

- a. distillate oil to 0.0015% sulfur by weight (15 ppm),*
- b. #4 residual oil within a range of 0.25 to 0.5% sulfur by weight,*
- c. #6 residual oil within a range of 0.3 to 0.5% sulfur by weight;*

On November 13, 2015, the District finalized a regulation to reduce the sulfur content of commercial fuel oil (20 DCMR § 801). The final rule called for a 500 ppm (0.05% by weight) limit on #2 oil and a 2,500 ppm (0.25% by weight) limit on #4 oil in 2016, and a 15 ppm (0.0015% by weight) limit on #2 oil in 2018. The final rule also banned #5 and #6 commercial fuel oil after July 1, 2016. It was included in the District’s SIP on October 11, 2016 (81 FR 70020), and thus the District is meeting “Ask 3.”

2.5.4 “Ask 4” – Updating Permits at Facilities Larger than 250 MMBtu Heat Input

EGUs and other large point emission sources larger than 250 MMBTU per hour heat input that have switched operations to lower emitting fuels – pursue updating permits, enforceable agreements, and/or rules to lock-in lower emission rates for SO₂, NO_x and PM. The permit, enforcement agreement, and/or rule can allow for suspension of the lower emission rate during natural gas curtailment

The District has one point source, U.S. GSA Central Heating and Refrigeration Plant (EIS ID: 2701211), which is larger than 250 MMBtu/hour heat input. On July 28, 2000, the facility was

limited through a Title V permit (permit No. 032) to only using natural gas as a primary fuel, and #2 oil with a maximum sulfur content of 0.05% by weight to be used only as a back-up fuel during natural gas supply interruptions by the supplier. Given that this permit was in place prior to the 2nd planning period and that it already meets the concerns put forth in “Ask 4,” no additional updates are necessary to meet “Ask 4.”

2.5.5 “Ask 5” – High Electricity Demand Day Units

Where emission rules have not been adopted, control NOx emissions for peaking combustion turbines that have the potential to operate on high electric demand days by:

- a. Striving to meet NOx emissions standard of no greater than 25 ppm at 15% O2 for natural gas and 42 ppm at 15% O2 for fuel oil but at a minimum meet NOx emissions standard of no greater than 42 ppm at 15% O2 for natural gas and 96 ppm at 15% O2 for fuel oil, or*
- b. Performing a four-factor analysis for reasonable installation or upgrade to emission controls, or*
- c. Obtaining equivalent alternative emission reductions on high electric demand days;*

The District has no combustion turbines that participate in selling electricity to the grid during High Electricity Demand Days. The District also has in place a regulation, *Reasonably Available Control Technology Requirements for Combustion Turbines* (65 DCR 13498, December 14, 2018), promulgated to comply with the NO_x RACT requirements under the 2008 Ozone NAAQS requiring emission standards for existing combustion turbines that meets the NO_x emission rates that all states within MANE-VU should strive to meet to under “Ask 5.” This rule applies to all combustion turbines in the District regardless of their electricity generating capabilities. This rule was submitted as a SIP enforceable measure to EPA as RACT for the 2008 Ozone NAAQS and this submission is currently under review by EPA. The District finds that its regulations would thus comply with “Ask 5.”

2.5.6 “Ask 6” – Energy Efficiency, Combined Heat and Power, and Clean Distributed Generation

Each State should consider and report in their SIP measures or programs to: a) decrease energy demand through the use of energy efficiency, and b) increase the use within their state of Combined Heat and Power (CHP) and other clean Distributed Generation technologies including fuel cells, wind, and solar.

The District has a variety of programs and initiatives underway that reduce air pollution through reduced energy use, energy efficiency, cogeneration, or clean distributed generation. In particular, the District has permitted several cogeneration facilities since 2011:

- George Washington University – 1 CHP unit at Ross Hall (EIS Facility ID: 12736411, EIS Unit ID: 129395613) - 20 DCMR Chapter 2 Permit No. 6618
- DC Water Blue Plains Facility – 3 CHP units powered by digester gas (EIS Facility ID: 18304511, EIS Unit IDs: 131130613, 131130713, 131130813) - 20 DCMR Chapter 2 Permit No. 6372

- Architect of the Capitol, Capitol Power Plant – 1 CHP unit fires primarily on natural gas, but with limited additional use of ultra-low sulfur diesel (EIS Facility ID: 2700711, EIS Unit ID: not yet assigned) – 20 DCMR Chapter 2 Permit 6663

The District adopted the Green Building Act in 2006 that requires that all non-residential District public buildings meet the U.S. Green Building Council's LEED certification standards for environmental performance at the “Silver” level or higher. The Green Building Act of 2006 also committed to a multi-pronged action plan to reduce energy consumption in over 65 million square feet of city and privately held buildings in the downtown core by at least 20 percent by 2020 through the U.S. Department of Energy’s Better Buildings Challenge among other programs.

Although not related to the energy sector the District is also working to reduce haze causing pollution from mobile sources as well, namely through the implementation of Title IV of the Clean Energy Omnibus Act of 2018 and the Volkswagen Settlement Mitigation Plan. The former will lead to increased electrification of mobile sources of various types and the latter will lead to electrification of District heavy-duty fleet vehicles and air quality improvements from switcher locomotives.

While these programs do have a benefit on air quality, the District maintains that it is not reasonably anticipated to impact visibility at any Class I Federal area and is not committing to include these as enforceable SIP provisions.

2.5.7 National Park Service Source Evaluation Request

This section describes the emission limitations at the source identified by NPS in their April 12, 2018 letter (Appendix 9). While the District maintains that this source is not reasonably anticipated to impact visibility at any Class I Federal area it is including a description of regulations, permit conditions impacting emissions at the source in this document.

20 DCMR § 801

20 DCMR § 801– prohibits the purchase, sale, offer for sale, storage, transport, or use of number two (No. 2) commercial fuel oil if it contains more than fifteen parts per million (15 ppm) or fifteen ten-thousandths percent (0.0015%) by weight of sulfur. The U.S. GSA Central Heating and Refrigeration Plant is authorized to use number two (No. 2) fuel oil in its Title V Permit when it is not powered by natural gas. No other fuels are authorized.

This rule primarily leads to reductions in SO₂ emissions, which would in turn react to form visibility-impairing sulfates, though NO_x and direct PM_{2.5} emissions will occur as well.

Note that 20 DCMR § 801 authorized use of non-compliant fuel purchased prior to the effective date of this standard.

20 DCMR § 805.4

On July 23, 2018, requirements went into effect in 20 DCMR § 805.4 that affect U.S. GSA Central Heating and Refrigeration Plant’s combined heat and power equipment. These

requirements are both equivalent to the New Source Performance Standard for Combustion Turbines (40 CFR Part 60 Subpart KKKK), considered by the District to be a Reasonably Available Control Technology (RACT) for NO_x under the 2008 Ozone NAAQS, and are equivalent to what was requested by MANE-VU as part of “Ask 5.” This regulation requires that the stationary combustion turbines at the facility meet the following limits to demonstrate Reasonably Available Control Technology (RACT) for NO_x:

- 20 DCMR § 805.4(a)(2)(a)(i): Twenty-five (25) ppmvd, corrected to fifteen percent (15%) O₂ when fired on any combination of gaseous fuels;
- 20 DCMR § 805.4(a)(2)(a)(ii): Except as provided in § 805.4(a)(2)(D) seventy-four (74) ppmvd, corrected to fifteen percent (15%) O₂ when fired on any combination of liquid fuels; and
- 20 DCMR § 805.4(a)(2)(D): Any stationary combustion turbine fired on liquid fuel or any combination of gaseous and liquid fuels, such that more than fifty percent (50%) of the total heat input is from liquid fuels, is not required to comply with the maximum allowable NO_x emission rate in § 805.4(a)(2)(A)(ii) if it meets the following requirements:
 - (i) The only liquid fuel used is Number two (No. 2) fuel oil (as determined in accordance with 20 DCMR § 502.6) not containing sulfur in excess of fifteen parts per million (15 ppm) by weight;
 - (ii) It burns liquid fuel only during periods of natural gas curtailment, natural gas supply interruption, startups, or periodic testing on liquid fuel, where such periodic testing does not exceed a combined total of forty-eight (48) hours during any calendar year.

The exception contained in § 805.4(a)(2)(D) is expected to apply to this facility as they are limited to only burning No. 2 fuel oil during natural gas interruptions, as limited in their Title V permit.

This rule primarily leads to reductions in NO_x emissions, which would in turn react to form visibility-impairing nitrates.

Title V Permit No. 032

On July 28, 2000, the facility was limited in a Title V permit (permit No. 032) to only using natural gas in their boilers except that No. 2 fuel oil can be used as a back-up fuel during natural gas interruptions. Additionally, the permit limits total No. 2 fuel oil use to 4,435,035 gallons per calendar year. This permit remains in effect and is currently under review for renewal and updates. The facility has requested that a 260 ton per year NO_x limit and a 62 ton per year SO₂ limit be placed in the permit as facility-wide limits.

20 DCMR Chapter 2 Permit No. 7161

On August 21, 2017, a permit (No. 7161) was issued for Boiler #6 (EIS Facility ID 2701211, Unit ID 41213713), a unit rated at 250 MMBTU/hour heat input, for the installation of Low NO_x

Burners, which is expected to reduce the potential to emit of this unit by 152.07 tons per year of NO_x. This permit establishes NO_x limits of 25.00 pounds per hour while burning natural gas and 37.50 pounds per hour while burning No. 2 fuel oil. This unit is also subject to annual combustion tuning for NO_x and CO. Also, due to the applicability of 40 CFR § 63, Subpart DDDDD, this permit incorporated a requirement to perform a one-time energy assessment.

Additionally, prior to the regional haze progress report that is due on January 31, 2025; a full review of all regulatory requirements and update of permit terms and conditions for all equipment at the facility is expected to have been completed as part of the renewal and update of the Title V permit. DOEE is also currently reviewing a permit update and renewal application for the combined heat and power equipment at the facility.

2.5.8 Downwind, States that are not in MANE-VU

No other states have informed the District that its emissions contribute to visibility impairment in their Class I Federal areas. The District is within 300 km of Shenandoah National Park and James River Face Wilderness in Virginia and Dolly Sods Wilderness and Otter Creek Wilderness in West Virginia. Neither of these states requested that the District consult with them during the first planning period. These four Class I Federal areas were analyzed in Section 2.4 and the District is not reasonably anticipated to contribute to visibility impairment at these Class I Federal areas. If Virginia, West Virginia, any other State, or another RPO requests that the District consult with them, the District commits to participate in such a consultation and will address the results of the consultation in an amendment to its implementation plan.

2.6 § 51.308 (f)(2)(iii) – Technical Documentation of Long-term Strategy

The State must document the technical basis, including modeling, monitoring, cost, engineering, and emissions information, on which the State is relying to determine the emission reduction measures that are necessary to make reasonable progress in each mandatory Class I Federal area it affects. The State may meet this requirement by relying on technical analyses developed by a regional planning process and approved by all State participants. The emissions information must include, but need not be limited to, information on emissions in a year at least as recent as the most recent year for which the State has submitted emission inventory information to the Administrator in compliance with the triennial reporting requirements of subpart A of this part. However, if a State has made a submission for a new inventory year to meet the requirements of subpart A in the period 12 months prior to submission of the SIP, the State may use the inventory year of its prior submission.

§ 51.308(f)(2)(iii) requires the District to identify the baseline emission inventory on which strategies are based. The baseline inventory is intended to be used to assess progress in making emission reductions. MANE-VU and the District are using 2011 as the baseline year inventory. A future year inventory was developed for 2028 based on the 2011 base year. This future year emission inventory includes emissions growth due to projected increases in economic activity as well as the emissions reductions due to the implementation of control measures.

The emissions dataset discussed below is the 2011 MANE-VU Version Gamma emissions inventory. The emission inventories include carbon monoxide (CO), but it is not considered in

this SIP, as it does not contribute to visibility impairment. The MANE-VU regional haze emissions inventory version Gamma, released in January 2018, was used for modeling purposes. This inventory was developed through the Mid-Atlantic Regional Air Management Association (MARAMA), the Eastern Regional Technical Advisory Committee (ERTAC) EGU Workgroup, and EPA.

The guiding philosophy behind the development of the 2011 inventory was to rely as much as possible on the collaborative work performed by the State/Local/Tribal (S/L/T) air agencies and the EPA in developing a 2011-based Modeling Platform. More detailed information regarding the Gamma Inventory and projections can be found in *Technical Support Document: Emission Inventory Development for 2011 for the Northeastern U.S. Gamma Version* (Appendix 9).

For the 2028 inventory, the guiding philosophy was to use a combination of S/L/T data and methods for projecting emissions from stationary sources and to rely on EPA's 2028 Modeling Platform for mobile source emission projections. More detailed information regarding the Gamma Inventory and projections can be found in *Technical Support Document for the 2011 for the Northeastern U.S. Gamma Inventory* (January 2018) and *Ozone Transport Commission/Mid-Atlantic Northeastern Visibility Union 2011 Based Modeling Platform Support Document – October 2018 Update* (October 2018) (Appendixes 9 and 10, respectively).

51.308(f)(2)(iii) also requires the District to document the technical basis, including modeling, monitoring, cost, engineering, and emissions information, on which the State is relying to determine the emission reduction measures that are necessary to make reasonable progress in each mandatory Class I Federal area it affects. Because the District does not significantly affect any Class I Federal area, the District is not subject to the requirement to make determinations about measures that are necessary to make reasonable progress. Instead, the District interprets this section to require the District to document the basis for its determination that the District does not significantly affect any Class I Federal area.

2.7 § 51.308 (f)(2)(iv) – Other Factors for Long-term Strategy

The State must consider the following additional factors in developing its long-term strategy:

(A) Emission reductions due to ongoing air pollution control programs, including measures to address reasonably attributable visibility impairment;

(B) Measures to mitigate the impacts of construction activities;

(C) Source retirement and replacement schedules;

(D) Basic smoke management practices for prescribed fire used for agricultural and wildland vegetation management purposes and smoke management programs; and

(E) The anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the period addressed by the long-term strategy.

2.7.1 § 51.308 (f)(2)(iv)(A) – Emission Reductions Due to Ongoing Air Pollution Programs

The District is required to consider emission reductions from ongoing pollution control programs in its regional haze SIP revision. While evidence shows that the District is not reasonably anticipated to contribute to visibility impairment, the District did examine ongoing federal and the District-specific emission control programs. These programs are described in more detail as follows.

EGU Emissions Controls that Will Reduce Emissions by 2028

The District no longer has any EGUs under its jurisdiction due to the source retirements that occurred during the first planning period that are discussed in more detail in Section 2.7.3.

Non-EGU Point Source Emission Reductions Expected by 2028 Due to Ongoing Air Pollution Control Programs

The following national control measures would impact emissions from non-EGU point sources in the District during the second planning period:

- Boiler National Emission Standards for Hazardous Air Pollutants; and
- Reciprocating Internal Combustion Engine (RICE) National Emission Standards for Hazardous Air Pollutants.

Table 2-4: District-specific measures for Non-EGU Point Sources that will reduce emissions by 2028

SIP-Approved Control Measures	District Regulation and Latest Effective Date		Latest EPA Approval into SIP
NO _x Emissions Budget and NO _x Limit Per Source	20 DCMR § 1001	3/08/2015	2/22/2016, 81 FR 8656
NO _x RACT for Combustion Turbines	20 DCMR § 805.4	12/14/2018	Currently under review by EPA

Nonpoint Source Controls Expected by 2028 Due to Ongoing Air Pollution Control Programs

The following national control measures would impact emissions from nonpoint source in the District during the second planning period:

- Portable Fuel Container Rules;
- Boiler National Emission Standards for Hazardous Air Pollutants; and
- Reciprocating Internal Combustion Engine (RICE) National Emission Standards for Hazardous Air Pollutants
- New Source Performance Standards for Stationary Compression Ignition Engines.

Table 2-5: District-specific measures for Nonpoint Sources that will control and reduce emissions by 2028

SIP-Approved Control Measures	District Regulation and Latest Effective Date		Latest EPA Approval into SIP
Seasonal Open Burning Restrictions	20 DCMR § 604	3/15/1985	8/28/1995, 60 FR 44431
Sulfur Content of Fuel Oil	20 DCMR § 801	08/16/15	10/11/2016, 81 FR 70020

Controls on Nonroad Sources Expected by 2028 due to Ongoing Air Pollution Control Programs

For nonroad mobile sources within MANE-VU, the District relied on MANE-VU’s Gamma Emissions Inventory for 2011 and 2028, which are based on EPA’s version ‘en’ and ‘el’ nonroad inventory, respectively.

- Nonroad source controls incorporated into the modeling include changes in fuels and engines that reflect implementation of national regulations that impact each year differently due to equipment turnover and fuel requirements.

Onroad Mobile Source Controls Expected by 2028 due to Ongoing Air Pollution Control Programs

For onroad mobile sources within MANE-VU, the District relied on MANE-VU’s Gamma Emissions Inventory for 2011 and 2028, both of which are based on EPA’s version ‘el’ MOVES inventory.

- Changes in fuels and engines that reflect implementation of national regulations impact each year differently due to equipment turnover and fuel requirements

Table 2-6: District-specific measures for onroad mobile sources that will control and reduce emissions by 2028

SIP-Approved Control Measures	District Regulation and Latest Effective Date		Latest EPA Approval into SIP
Transportation Conformity Regulation	20 DCMR § 1500	01/08/2010	05/28/2010, 75 FR 29894

2.7.2 § 51.308 (f)(2)(iv)(B) –Measures to Mitigate the Impacts of Construction Activities

The District is required to consider measures to mitigate the impacts of construction activities on regional haze. *The Nature of the Fine Particle and Regional Haze Air Quality Problems in the MANE-VU Region: A Conceptual Description* (NESCAUM, August 2010) (Appendix 12) found that, from a regional haze perspective, crustal material generally continues to not play a major role in visibility impairment at MANE-VU Class I Federal areas.

A description of MANE-VU’s consideration of measures to mitigate the impacts of construction for the first implementation period can be found in the MANE-VU Construction Technical Support Document entitled, *Technical Support Document on Measures to Mitigate the Visibility Impacts of Construction Activities in the MANE-VU Region* (MANE-VU, September 2006)

(Appendix 13). The following statements summarize the main points of this technical support document:

- Although a temporary source, fugitive dust and diesel emissions from construction activities can have an effect on local air quality;
- While construction activities are responsible for a relatively large fraction of direct PM_{2.5} and PM₁₀ emissions in the Region, the impact on visibility is less because dust settles out of the air relatively close to the sources;
- Ambient air quality data shows that soil dust makes up only a minor fraction of the PM_{2.5} measured in MANE-VU Class I Federal areas, and impacts of diesel emissions in these rural areas are also a small part of total PM_{2.5}; and
- The use of measures such as clean fuels, retrofit technology, best available technology, specialized permits, and truck staging areas (to limit the adverse impacts of idling) can help decrease the effects of diesel emissions on local air quality.

Section 605 of Title 20 District of Columbia Municipal Regulations, Control of Fugitive Dust, requires reasonable precautions to minimize emissions of fugitive dust into the atmosphere. Additional measures to mitigate the impact on Class I Federal areas of construction emissions are not needed in the District’s SIP.

2.7.3 § 51.308 (f)(2)(iv)(C) –Source Retirement and Replacement Schedules

The District is required to consider source retirement and replacement schedules in developing its long-term-strategies. The EGU point sources retired in the inventories used in the MANE-VU contribution assessment are in Table 2-7. One can see in Figure 2-2 when emission reductions will occur throughout the year. The annual reductions are 502 and 221 tons of SO₂ and 136 and 68 tons of NO_x from 2011 for Unit 15 and Unit 16, respectively.

Table 2-7: EGU units retired in the regional haze inventories

Facility Name	ORIS ID	CAMD Unit ID	Inventory Offline Date
Benning Generation Station	603	15	6/1/2012
Benning Generation Station	603	16	6/1/2012

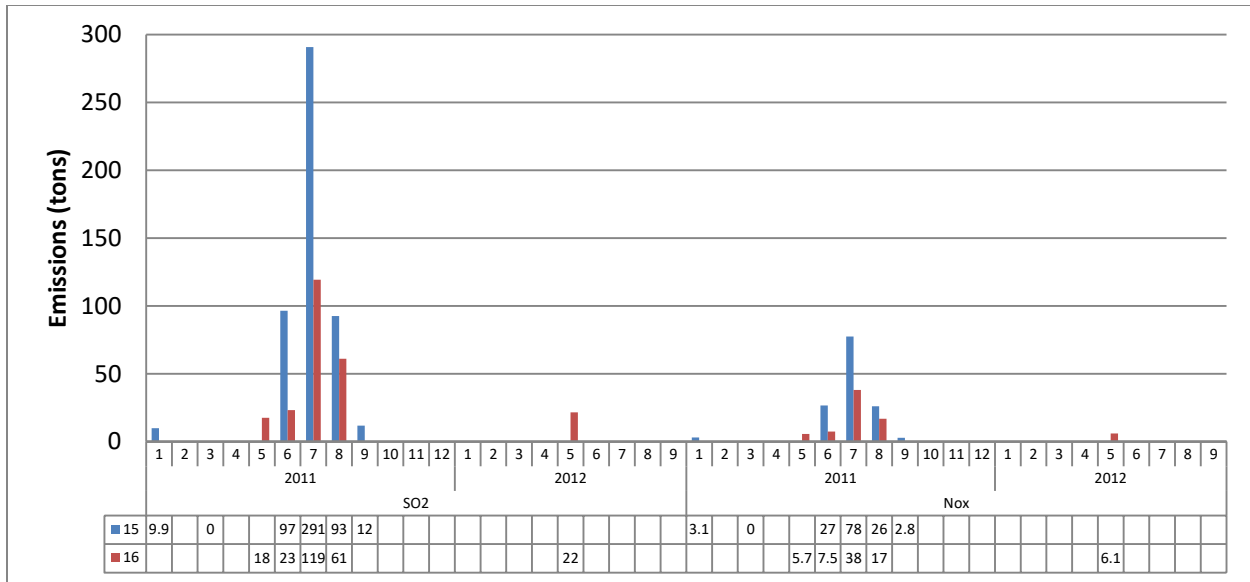


Figure 2-2: SO₂ and NO_x emissions at Benning Road Facility (ORIS ID: 603) in 2011 and 2012 by month

There are no non-EGU point sources in the District that were considered when developing the 2028 emissions projections.

2.7.4 § 51.308 (f)(2)(iv)(D) –Agricultural and Forestry BSPMs and Smoke Management Programs

The District is required to consider inclusion of basic smoke management practices for prescribed fire used for agricultural and wildland vegetation management purposes and smoke management programs in its long-term strategy. Being an urban environment, the District does not have agricultural or prescribed forest burns and thus does not have a smoke management plan. Additional measures to mitigate the impact on Class I Federal areas of smoke emissions from agricultural and forest fires are not needed in the District’s SIP.

2.7.5 § 51.308 (f)(2)(iv)(E) –Anticipated Net Impact on Visibility due to Projected Emissions Changes over the Long-term Strategy Period

40 CFR § 51.308(f)(2)(iv)(E) requires the District to consider the net effect on visibility resulting from changes projected in point, area, and mobile source emissions over the period addressed by the long-term strategy, in developing its long-term strategy.

Photochemical modeling for the 2018-2028 implementation period was conducted by MANE-VU after consultation with states within and outside of MANE-VU. Two modeling cases were completed - a 2028 base case that considers only on-the-books controls and a 2028 control case that considers implementation of the MANE-VU “Ask.”

For the District, the base case modeling includes measures listed in Section 2.5.4 (“Ask 4”), Section 2.5.5 (“Ask 5”), Section 2.7.1 (§ 51.308 (f)(2)(iv)(A)), and Section 2.7.3 (§ 51.308 (f)(2)(iv)(C)). The District included the measure listed in Section 2.5.3 (“Ask 3”) in the control

case modeling, but it was not included in the base case modeling, because the low sulfur fuel oil rule is currently considered as a clean air set aside and thus the District is not claiming credit for the emission reductions from the program.

MANE-VU did not separate out individual states impact on visibility when conducting the modeling exercise, but simply calculated the resulting change in visibility in deciviews, on the 20% most impaired and 20% clearest days, from the 2011 baseline for the two modeling runs for both the base and control case. In the base case modeling improvements were projected on the 20% most impaired days in 2028 of 4.1, 6.29, 5.89, and 6.18 deciviews at Brigantine Wilderness, Dolly Sods Wilderness, James River Face Wilderness, and Shenandoah National Park, respectively. The base case modeling also projects improvements in the 20% clearest days, meaning no degradation is expected on those days. Full documentation of the modeling can be found in *Ozone Transport Commission/Mid-Atlantic Northeastern Visibility Union 2011 Based Modeling Platform Support Document – October 2018 Update* (Ozone Transport Commission, October 2018) (Appendix 11).

2.8 § 51.308 (f)(3)(i) – Reasonable Progress Goals

A state in which a mandatory Class I Federal area is located must establish reasonable progress goals (expressed in deciviews) that reflect the visibility conditions that are projected to be achieved by the end of the applicable implementation period as a result of those enforceable emissions limitations, compliance schedules, and other measures required under paragraph (f)(2) of this section that can be fully implemented by the end of the applicable implementation period, as well as the implementation of other requirements of the CAA. The long-term strategy and the reasonable progress goals must provide for an improvement in visibility for the most impaired days since the baseline period and ensure no degradation in visibility for the clearest days since the baseline period.

The District does not have any Class I Federal areas located within its borders and thus is not required to comply with § 51.308 (f)(3)(i).

2.9 § 51.308 (f)(3)(ii)(A) – Reasonable Progress Goals Above the Uniform Rate of Progress

If a State in which a mandatory Class I Federal area is located establishes a reasonable progress goal for the most impaired days that provides for a slower rate of improvement in visibility than the uniform rate of progress calculated under paragraph (f)(1)(vi) of this section, the State must demonstrate, based on the analysis required by paragraph (f)(2)(i) of this section, that there are no additional emission reduction measures for anthropogenic sources or groups of sources in the State that may reasonably be anticipated to contribute to visibility impairment in the Class I Federal area that would be reasonable to include in the long-term strategy. The State must provide a robust demonstration, including documenting the criteria used to determine which sources or groups or sources were evaluated and how the four factors required by paragraph (f)(2)(i) were taken into consideration in selecting the measures for inclusion in its long-term strategy. The State must provide to the public for review as part of its

implementation plan an assessment of the number of years it would take to attain natural visibility conditions if visibility improvement were to continue at the rate of progress selected by the State as reasonable for the implementation period.

The District does not have any Class I Federal areas located within its borders and thus is not required to comply with § 51.308 (f)(3)(ii)(A).

2.10 § 51.308 (f)(3)(ii)(B) – Upwind States Impact on Reasonable Progress Goals

If a State contains sources which are reasonably anticipated to contribute to visibility impairment in a mandatory Class I Federal area in another State for which a demonstration by the other State is required under (f)(3)(ii)(A), the State must demonstrate that there are no additional emission reduction measures for anthropogenic sources or groups of sources in the State that may reasonably be anticipated to contribute to visibility impairment in the Class I Federal area that would be reasonable to include in its own long-term strategy. The State must provide a robust demonstration, including documenting the criteria used to determine which sources or groups or sources were evaluated and how the four factors required by paragraph (f)(2)(i) were taken into consideration in selecting the measures for inclusion in its long-term strategy.

In Section 2.4 the District demonstrated that it does not contain sources, which are reasonably anticipated to contribute to visibility impairment at any mandatory Class I Federal area.

2.11 § 51.308 (f)(3)(iii) – Enforceability of Reasonable Progress Goals

The reasonable progress goals established by the State are not directly enforceable but will be considered by the Administrator in evaluating the adequacy of the measures in the implementation plan in providing for reasonable progress towards achieving natural visibility conditions at that area.

§ 51.308 (f)(3)(iii) applies to the Administrator when assessing SIPs rather than to States and thus is not applicable to the District.

2.12 § 51.308 (f)(3)(iv) – Evaluation of Reasonable Progress Goals

In determining whether the State's goal for visibility improvement provides for reasonable progress towards natural visibility conditions, the Administrator will also evaluate the demonstrations developed by the State pursuant to paragraphs (f)(2) and (f)(3)(ii)(A) of this section and the demonstrations provided by other States pursuant to paragraphs (f)(2) and (f)(3)(ii)(B) of this section.

§ 51.308 (f)(3)(iv) applies to the Administrator when assessing SIPs rather than to States and thus is not applicable to the District.

2.13 § 51.308 (f)(4) – Reasonably Attributable Visibility Impairment Monitoring

If the Administrator, Regional Administrator, or the affected Federal Land Manager has advised a State of a need for additional monitoring to assess reasonably attributable visibility impairment at the mandatory Class I Federal area in addition to the monitoring

currently being conducted, the State must include in the plan revision an appropriate strategy for evaluating reasonably attributable visibility impairment in the mandatory Class I Federal area by visual observation or other appropriate monitoring techniques.

The District has not been advised by the Administrator, Regional Administrator, or any Federal Land Manager of the need to conduct additional monitoring to assess reasonably attributable visibility impairment and thus is in compliance with § 51.308 (f)(4).

2.14 § 51.308 (f)(5) – Second Planning Period Progress Report Requirement

So that the plan revision will serve also as a progress report, the State must address in the plan revision the requirements of paragraphs (g)(1) through (5) of this section. However, the period to be addressed for these elements shall be the period since the most recent progress report.

The District demonstrates compliance with this requirement in in Sections 2.16 through 2.24 of this document.

2.15 § 51.308 (f)(6) – Monitoring Strategy

Monitoring strategy and other implementation plan requirements. *The State must submit with the implementation plan a monitoring strategy for measuring, characterizing, and reporting of regional haze visibility impairment that is representative of all mandatory Class I Federal areas within the State. Compliance with this requirement may be met through participation in the Interagency Monitoring of Protected Visual Environments network. The implementation plan must also provide for the following:*

(i) The establishment of any additional monitoring sites or equipment needed to assess whether reasonable progress goals to address regional haze for all mandatory Class I Federal areas within the State are being achieved.

(ii) Procedures by which monitoring data and other information are used in determining the contribution of emissions from within the State to regional haze visibility impairment at mandatory Class I Federal areas both within and outside the State.

(iii) For a State with no mandatory Class I Federal areas, procedures by which monitoring data and other information are used in determining the contribution of emissions from within the State to regional haze visibility impairment at mandatory Class I Federal areas in other States.

(iv) The implementation plan must provide for the reporting of all visibility monitoring data to the Administrator at least annually for each mandatory Class I Federal area in the State. To the extent possible, the State should report visibility monitoring data electronically.

(v) A statewide inventory of emissions of pollutants that are reasonably anticipated to cause or contribute to visibility impairment in any mandatory Class I Federal area. The inventory must include emissions for the most recent year for which data are available, and estimates of future projected emissions. The State must also include a commitment to update the inventory periodically.

(vi) Other elements, including reporting, recordkeeping, and other measures, necessary to assess and report on visibility.

The District does not have any Class I Federal areas located within its borders and thus is not required to comply with § 51.308 (f)(6) nor any of the subsections, excepting § 51.308(f)(6)(iii).

§ 51.308(f)(6)(iii) requires the inclusion of procedures by which monitoring data and other information are used in determining the contribution of emissions from within the State to visibility impairment at mandatory Class I Federal areas. States with Class I Federal areas must establish a monitoring program and report data to EPA that is representative of visibility at the Class I Federal areas. The IMPROVE network meets this requirement.

As a participant in MANE-VU, the District reviewed information about the chemical composition of baseline monitoring data at Class I Federal areas in and near MANE-VU in order to understand the sources of haze causing pollutants.

Additionally, EPA in its draft guidance on regional haze stated “EPA is not expecting that any state will need to address these requirements in a manner differently than in its SIP for the first implementation period. States with questions or concerns, or that receive public comments that raise issues related to these requirements, should consult with their EPA regional office and with the FLMs for affected Class I areas,” which further supports the adequacy of the current network since it was cited in the District’s SIP for the first planning period.²

The District commits to continuing support of ongoing visibility monitoring in Class I Federal areas. The IMPROVE network currently meets this monitoring goal, and the District agrees that IMPROVE is an appropriate monitoring network to track regional haze progress and will work with neighboring states and the FLMs to meet the goals of the IMPROVE program.

In the future, as required by 40 CFR 51.308 (f), the District will use monitoring data and procedures consistent with US EPA guidance to review progress and trends in visibility at Class I Federal areas that may be affected by emissions from the District both for comprehensive periodic revisions of this implementation plan and for periodic reports describing progress towards the reasonable progress goals for those areas.

2.16 § 51.308 (g) – Progress Report Requirements

Requirements for periodic reports describing progress towards the reasonable progress goals. Each State identified in § 51.300(b) must periodically submit a report to the Administrator evaluating progress towards the reasonable progress goal for each mandatory Class I Federal area located within the State and in each mandatory Class I Federal area located outside the State that may be affected by emissions from within the

² US EPA, “Draft Guidance on Progress Tracking Metrics, Long-Term Strategies, Reasonable Progress Goals and Other Requirements for Regional Haze State Implementation Plans for the Second Implementation Period,” July 2016.

State. The first progress report is due 5 years from submittal of the initial implementation plan addressing paragraphs (d) and (e) of this section. The first progress reports must be in the form of implementation plan revisions that comply with the procedural requirements of § 51.102 and § 51.103. Subsequent progress reports are due by January 31, 2025, July 31, 2033, and every 10 years thereafter. Subsequent progress reports must be made available for public inspection and comment for at least 30 days prior to submission to EPA and all comments received from the public must be submitted to EPA along with the subsequent progress report, along with an explanation of any changes to the progress report made in response to these comments. Periodic progress reports must contain at a minimum the following elements...

The District is required to address section § 51.308 (g) due to the requirements of § 51.308 (f)(5) and shall do so in the subsequent sections.

The District will submit a report on reasonable progress to EPA by January 31, 2025; July 31, 2033; and every 10 years thereafter. The reports will evaluate the progress made towards the reasonable progress goals for of all Class I Federal Areas within 300 kilometers of the District: Brigantine Wilderness area in New Jersey, Shenandoah National Park in Virginia, the Dolly Sods and Otter Creek Wilderness Areas in West Virginia, and the James River Face Wilderness in Virginia. All requirements listed in § 51.308(g) shall be addressed in the progress report. A summary of submittal dates through July 31, 2043 is shown below:

Report	Due date
10-Year SIP	July 31, 2021
5-Year Progress Report	January 31, 2025
10-Year SIP	July 31, 2028
5-Year Progress Report	July 31, 2033
10-Year SIP	July 31, 2038
5-Year Progress Report	July 31, 2043

In accordance with § 51.308(h), at the time of the report submission due on January 31, 2025, the District will also submit a determination of the adequacy of its existing Regional Haze SIP revision.

2.17 § 51.308 (g)(1) – Status of Measure Implementation

A description of the status of implementation of all measures included in the implementation plan for achieving reasonable progress goals for mandatory Class I Federal areas both within and outside the State.

As a member of MANE-VU, the District agreed to pursue the adoption of a coordinated long-term strategy (the MANE-VU Ask) to achieve RPGs for Class I Federal areas within MANE-VU. The District’s SIP did not include a goal related to 167 stacks, since none of the targeted sources were in the District. All of the other measures in MANE-VU’s Ask have been pursued:

Timely implementation of BART – The District had two EGUs at the Pepco Benning Road Generation Station that were included in its Regional Haze SIP. As indicated in the SIP, the

facility accepted a permit condition to shut down the EGUs by December 17, 2012. The permit condition was submitted with the SIP and became federally enforceable (77 Fed. Reg. 5191; February 2, 2012). The arrangement exempted the units from triggering BART requirements.

Low sulfur home heating oil – On November 13, 2015, the District finalized a regulation to reduce the sulfur content of commercially available home heating oil (20 DCMR § 801). The final rule implemented the following: a 500 ppm (0.05% by weight) limit on #2 oil in 2016, a 2,500 ppm (0.25% by weight) limit on #4 oil in 2016, and a 15 ppm (0.0015% by weight) limit on #2 oil in 2018. The final rule also banned #5 and #6 commercial fuel oil after July 1, 2016.

2.18 § 51.308 (g)(2) – Emission Reductions from Measure Implementation

A summary of the emissions reductions achieved throughout the State through implementation of the measures described in paragraph (g)(1) of this section.

In Section 2.17 the District described the measures included in the implementation plan needed for upwind Class I Federal areas to achieve their reasonable progress goals. These measures achieved the following emission reductions as of the end of calendar year 2018.

Timely implementation of BART – The District had two electric generating units (EGUs) at the Pepco Benning Road Generation Station that were included in its Regional Haze SIP. As indicated in the SIP, the facility accepted a permit condition to shut down the EGUs by December 17, 2012. Analysis of the change in emissions that resulted from the retirement of these units can be found in Section 2.7.3.

Low sulfur heating oil – On November 13, 2015, the District finalized a regulation to reduce the sulfur content of commercially available home heating oil (62 DCR 014839). The emission reductions that were calculated for the non-EGU point source and nonpoint sectors are in Table 2-8, but the District is not taking credit for these reductions as part of the SIP.

Table 2-8: Emission reductions due to implementation of the low sulfur heating oil regulation in 2028 (annual tons)

Pollutant	Non-EGU Point	Nonpoint
SO ₂	7	615
NO _x	3	19

2.19 § 51.308 (g)(3) – Assessment of Reasonable Progress Goals

For each mandatory Class I Federal area within the State, the State must assess the following visibility conditions and changes, with values for most impaired, least impaired and/or clearest days as applicable expressed in terms of 5-year averages of these annual values. The period for calculating current visibility conditions is the most recent 5-year period preceding the required date of the progress report for which data are available as of a date 6 months preceding the required date of the progress report.

The District does not have any Class I Federal areas located within its borders and thus is not required to comply with § 51.308 (g)(iii).

2.20 § 51.308 (g)(4) – Emissions Analysis

An analysis tracking the change over the period since the period addressed in the most recent plan required under paragraph (f) of this section in emissions of pollutants contributing to visibility impairment from all sources and activities within the State. Emissions changes should be identified by type of source or activity. With respect to all sources and activities, the analysis must extend at least through the most recent year for which the state has submitted emission inventory information to the Administrator in compliance with the triennial reporting requirements of subpart A of this part as of a date 6 months preceding the required date of the progress report. With respect to sources that report directly to a centralized emissions data system operated by the Administrator, the analysis must extend through the most recent year for which the Administrator has provided a State-level summary of such reported data or an internet-based tool by which the State may obtain such a summary as of a date 6 months preceding the required date of the progress report. The State is not required to backcast previously reported emissions to be consistent with more recent emissions estimation procedures, and may draw attention to actual or possible inconsistencies created by changes in estimation procedures.

To this end, the District has provided, in Sections 2.20.1 through 2.20.4, a summary of emissions of visibility impairing pollutants from all sources and activities within the District for the time period from 2002 to 2014. 2014 is the most recent year for which the District has submitted emissions estimates to fulfill the requirements of 40 CFR 51 Subpart A (also known as the Air Emissions Reporting Requirements, or AERR). Data categories include point sources, nonpoint sources, nonroad mobile sources, and onroad mobile sources. A brief description of each of these categories is provided below:

- Point sources are discrete facilities that generally report their emissions directly via state and/or Federal permitting and reporting programs. Point sources usually represent larger facilities such as EGUs, factories, and heating plants for large schools and universities. In the tables and charts that follow, point sources of NO_x and SO₂ are further broken down into Air Markets Program Division (AMPD) sources and non-AMPD sources. The majority of sources that report to one or more of EPA's AMPD programs are EGUs. Therefore, the AMPD point category is a reasonable representation of emissions from EGUs.
- Nonpoint sources are those emissions categories that are too small, widespread, or numerous to be inventoried individually. Therefore, emissions are estimated for these categories using aggregate activity data such as population, employment, and statewide fuel use (after accounting for the fuel used by point sources). There is a wide range of nonpoint categories, but examples include residential fuel combustion and commercial and consumer solvent use.
- Nonroad mobile sources represent vehicles and equipment that are not designed to operate on roadways. Examples include aircraft, ships, locomotives, construction equipment, recreational vehicles, and lawn and garden equipment (note, however, that

emissions from airports and some large rail yards are inventoried as point sources since these emissions occur at discrete locations).

- Onroad mobile sources represent vehicles that operate on roadways, including cars, trucks, buses, and motorcycles.

The summary data was taken from EPA’s National Emissions Inventory (NEI). Under the Air Emissions Reporting Rule, states are required to submit estimates for all emissions categories to EPA on a three-year cycle. The state submittals are combined with EPA’s own estimates to form the NEI. Note that 2005 was a limited effort NEI, so that year is not shown. A brief discussion of the trends in emissions is provided in the section for each pollutant. Inconsistencies due to changes in estimation procedures are also pointed out, where applicable.

In this summary, the District has provided estimates for NO_x, PM₁₀, PM_{2.5}, SO₂, and ammonia (NH₃), all of which have the potential to contribute to regional haze formation.

2.20.1 Nitrogen Oxides

Table 2-9 shows a summary of NO_x emissions from all data categories – point, nonpoint, nonroad, and onroad – for the period from 2002 to 2014 in the District. This summary is also shown graphically in Figure 2-3.

Table 2-9: NO_x Emissions in the District for all Data Categories, 2002 – 2014 (Tons)

Category	2002	2008	2011	2014
AMPD Point	798	291	320	108
Non-AMPD Point	330	306	372	340
Nonpoint	2,208	1,734	1,607	1,801
Nonroad	3,061	2,686	2,364	1,934
Onroad	8,772	8,173	4,739	4,384
Total	15,169	13,189	9,403	8,566

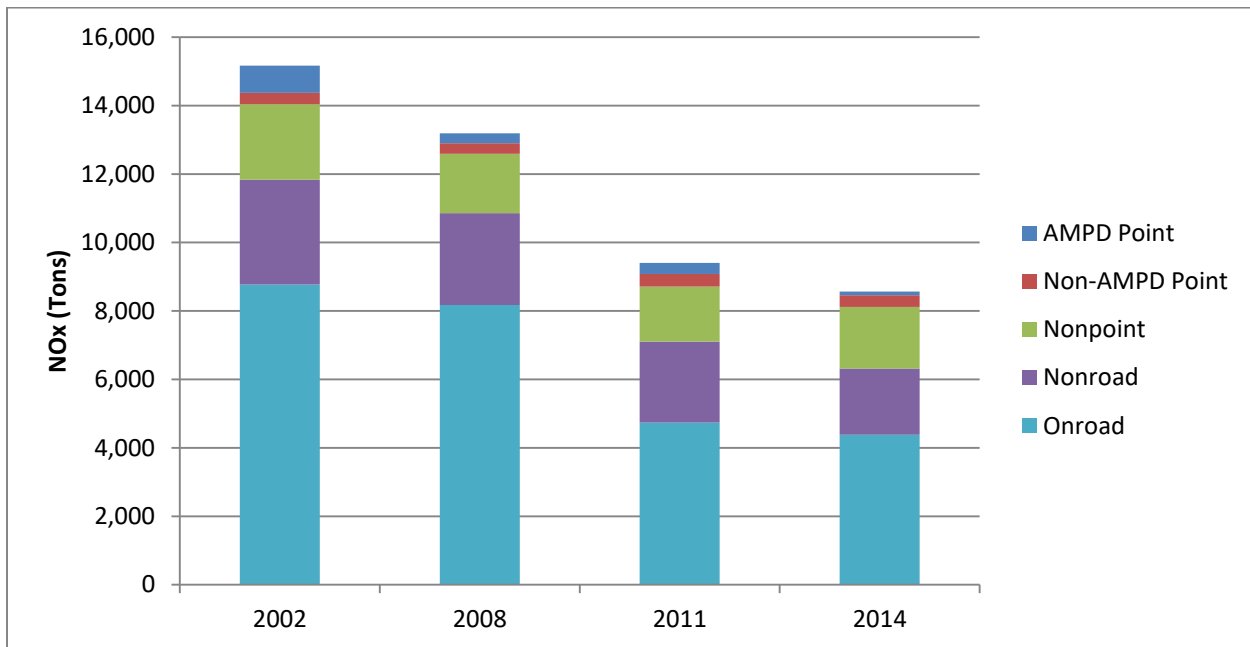


Figure 2-3: NO_x Emissions in the District for all Data Categories, 2002 – 2014

NO_x emissions have shown a steady decline in the District over the period from 2002 to 2014, particularly in the AMPD, nonroad, and onroad mobile sectors. Reductions in AMPD emissions are predominately due to source retirements.

Reductions in nonroad emissions are due to a wide range of Federal rules to reduce emissions from nonroad vehicles and equipment. A few examples of regulatory programs that have reduced, and/or will continue to reduce, emissions from nonroad vehicles and equipment include Control of Emissions of Air Pollution From Nonroad Diesel Engines and Fuel³, Control of Emissions from Air Pollution From Locomotive Engines and Marine Compression-Ignition Engines Less Than 30 Liters Per Cylinder⁴, and Control of Emissions from Nonroad Spark-Ignition Engines and Equipment⁵.

Onroad mobile emissions reductions are due in part to Federal requirements for onroad vehicles such as the Tier 2 motor vehicle emissions standards⁶. It should also be noted that Federal requirements for onroad mobile sources and fuels are being strengthened even further with the Tier 3 requirements⁷. More information on programs to control emissions from mobile sources

³ Control of Emissions of Air Pollution From Nonroad Diesel Engines and Fuel (69 Fed. Reg. 38958, June 29, 2004).

⁴ Control of Emissions of Air Pollution From Locomotive Engines and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder, (73 Fed. Reg. 37096, June 30, 2008).

⁵ Control of Emissions from Nonroad Spark-Ignition Engines and Equipment (73 Fed. Reg. 59034, October 8, 2008).

⁶ Control of Air Pollution from New Motor Vehicles: Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements (65 Fed. Reg. 6698, February 10, 2000).

⁷ Control of Air Pollution from Motor Vehicles: Tier 3 Motor Vehicle Emission and Fuel Standards (79 Fed. Reg. 23414, April 28, 2014).

can be found on EPA’s Transportation, Air Pollution, and Climate Change website⁸. For both nonroad and onroad mobile sources, NO_x emissions are expected to continue to decrease as fleets turn over and older more polluting vehicles and equipment are replaced by newer, cleaner ones.

The District has also provided a summary of 2016 and 2017 NO_x emissions for sources that report to one or more EPA’s AMPD programs. This is shown in Table 2-10 below, and it can be seen that NO_x emissions from AMPD sources in the District have declined from 2016 to 2017.

Table 2-10: NO_x Emissions from AMPD Sources in the District, 2016 – 2017 (Tons)

2016	2017
68	42

2.20.2 Particulate Matter Less Than 10 Microns

Table 2-11 shows a summary of PM₁₀ emissions from all data categories – point, nonpoint, nonroad, and onroad – for the period from 2002 to 2014 in the District. This summary is also shown graphically in Figure 2-4. Generally, PM₁₀ emissions decreased significantly in the District.

Table 2-11: PM₁₀ Emissions in the District for all Data Categories, 2002 – 2014 (Tons)

Category	2002	2008	2011	2014
Point	128	49	35	33
Nonpoint	6,194	4,394	2,643	3,087
Nonroad	298	230	212	176
Onroad	219	538	520	569
Total	6,839	5,211	3,410	3,865

⁸<https://www.epa.gov/air-pollution-transportation>

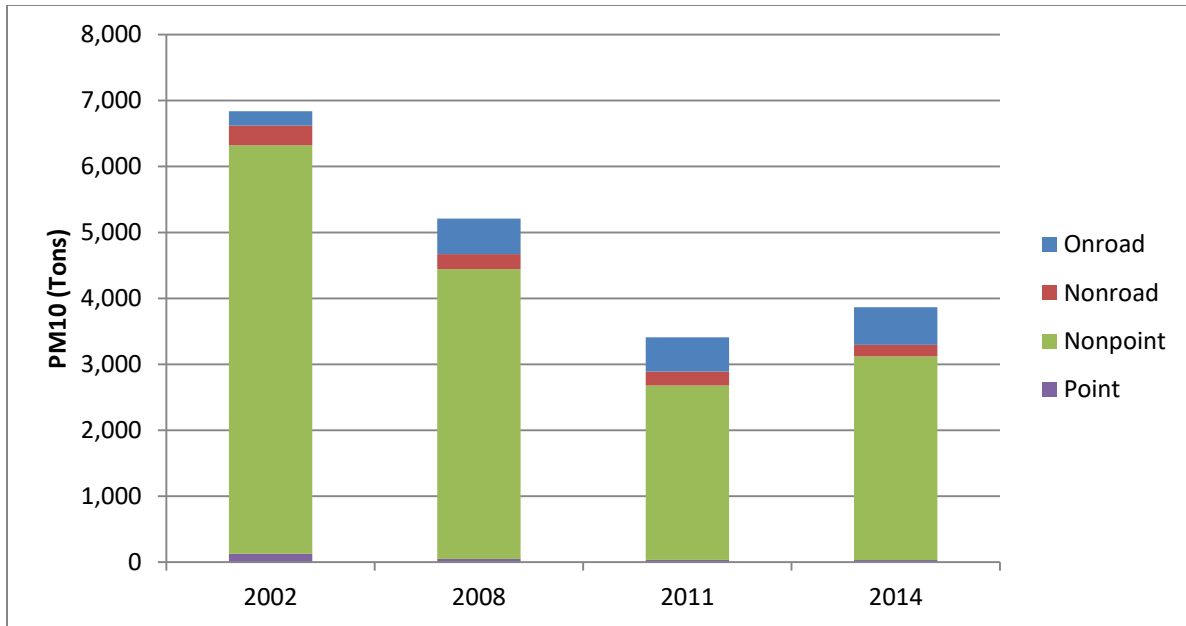


Figure 2-4: PM10 Emissions in the District for all Data Categories, 2002 – 2014

2.20.3 Sulfur Dioxide

Table 2-12 shows SO₂ emissions in the District for all data categories for the NEI periods from 2002 to 2014; this data is also shown graphically in Figure 2-5. SO₂ emissions have, for the most part, shown a steady decline in the District over the period from 2002 to 2014. An exception occurred in 2011 due to Pepco Benning Road Generation Station, which is now shut down, increasing the amount of #4 fuel oil used substantially from 2008. This is primarily due to source retirements. The District’s AMPD sources continued to emit no SO₂ in 2016 and 2017.

Table 2-12: SO₂ Emissions in the District from all Data Categories, 2002 – 2014 (Tons)

Category	2002	2008	2011	2014
AMPD Point	1,087	261	723	0
Non-AMPD Point	970	82	65	49
Nonpoint	1,380	820	991	147
Nonroad	344	58	6	4
Onroad	271	52	45	51
Total	4,051	1,273	1,829	252

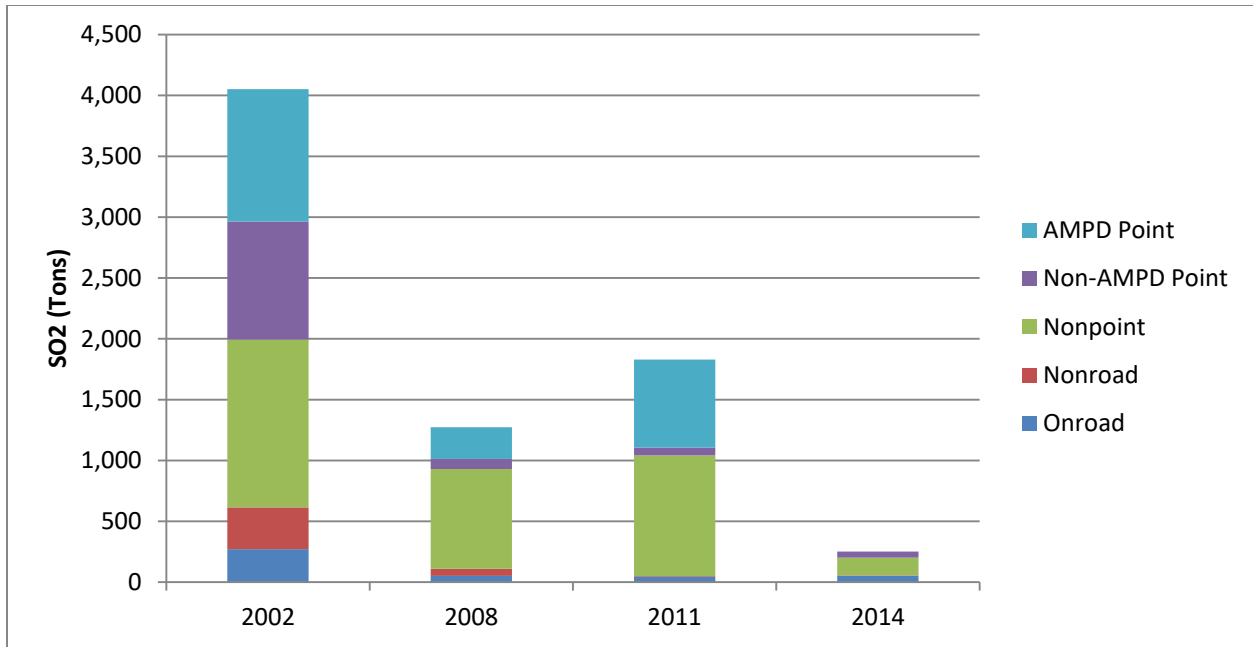


Figure 2-5: SO₂ Emissions in the District from all Data Categories, 2002 – 2014

2.20.4 Ammonia

Table 2-13 shows NH₃ emissions for all data categories in the District. This is shown graphically in Figure 2-6. It should be noted that the decrease in onroad and the increase in nonpoint ammonia between the 2002 and 2008 is due to changes in inventory estimation methodologies. Ammonia emissions were stable between the 2008, 2011, and 2014 inventories.

Table 2-13: NH₃ Emissions in the District from all Data Categories, 2002 – 2014 (Tons)

Category	2002	2008	2011	2014
Point	12	0	0	0
Nonpoint	8	180	172	153
Nonroad	2	3	3	3
Onroad	398	172	155	161
Total	421	354	330	317



Figure 2-6: NH₃ Emissions in the District from all Data Categories, 2002 - 2014 (Tons)

2.21 § 51.308 (g)(5) – Assessment of Significant Emissions Changes

An assessment of any significant changes in anthropogenic emissions within or outside the State that have occurred since the period addressed in the most recent plan required under paragraph (f) of this section including whether or not these changes in anthropogenic emissions were anticipated in that most recent plan and whether they have limited or impeded progress in reducing pollutant emissions and improving visibility.

In general, anthropogenic haze-causing pollutant emissions in the District and throughout the MANE-VU region have continued to decrease during the second five-year period. The analysis and summaries in Section 2.20 include all relevant significant emission sources and show that none have limited or impeded progress for the regional haze program during the reporting period.

2.22 § 51.308 (g)(6) – Assessment of Adequacy of Strategies to Ensure Reasonable Progress Goals

An assessment of whether the current implementation plan elements and strategies are sufficient to enable the State, or other States with mandatory Class I Federal areas affected by emissions from the State, to meet all established reasonable progress goals for the period covered by the most recent plan required under paragraph (f) of this section.

Figure 2-7 through Figure 2-10 taken the report *Mid-Atlantic/Northeast U.S. Visibility Data 2004-2017 (2nd RH SIP Metrics)* (MANE-VU, December 2018) (Appendix 13), show the progress made at the four Class I Federal areas with IMPROVE monitors that are within 300 km of the District. It is challenging to compare exactly how progress has been made towards the

2018 Reasonable Progress Goals for these four Class I areas because the algorithm used in calculating the metrics has changed substantially between the first and second planning periods. However, it is clear that the 5-year rolling deciview average on both the 20% most impaired days and the 20% clearest days is well below the Uniform Rate of Progress and that one-year deciview values are at or near to what was modeled in MANE-VU modeling for 2028. The District assesses that the Class I Federal areas that were considered during the first planning period are adequately meeting their Reasonable Progress Goals.

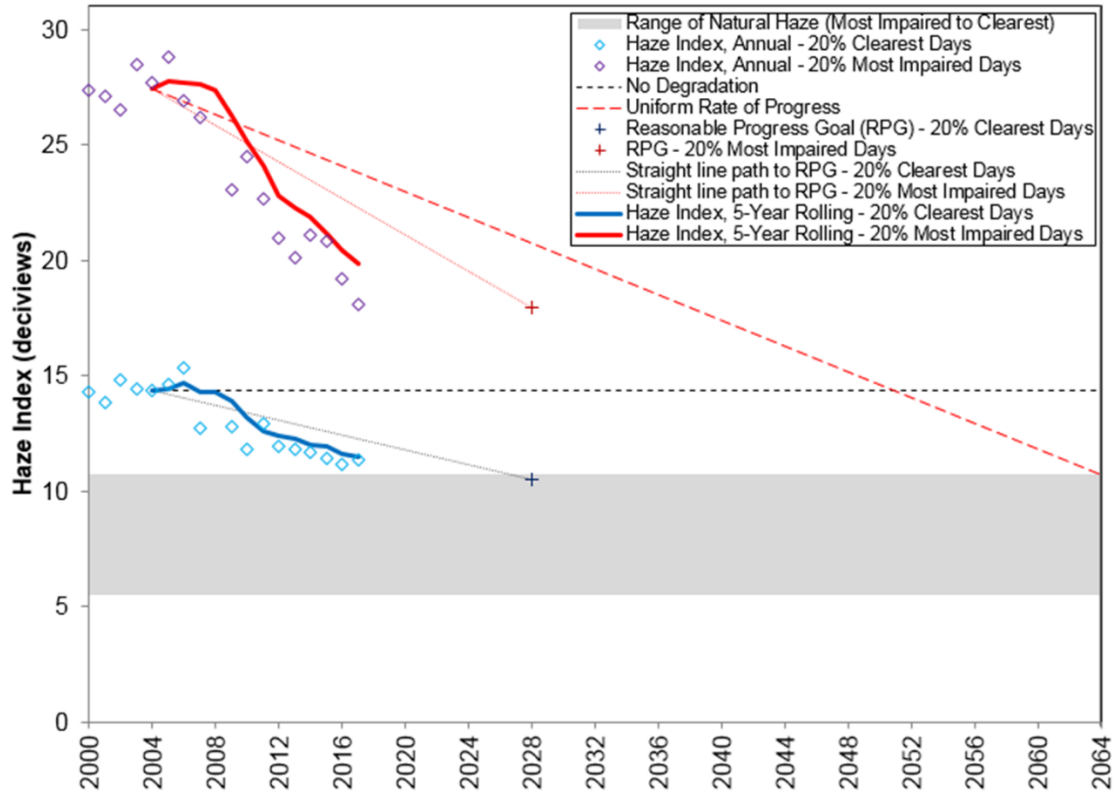


Figure 2-7: Visibility Metrics Levels at Brigantine Wilderness Area

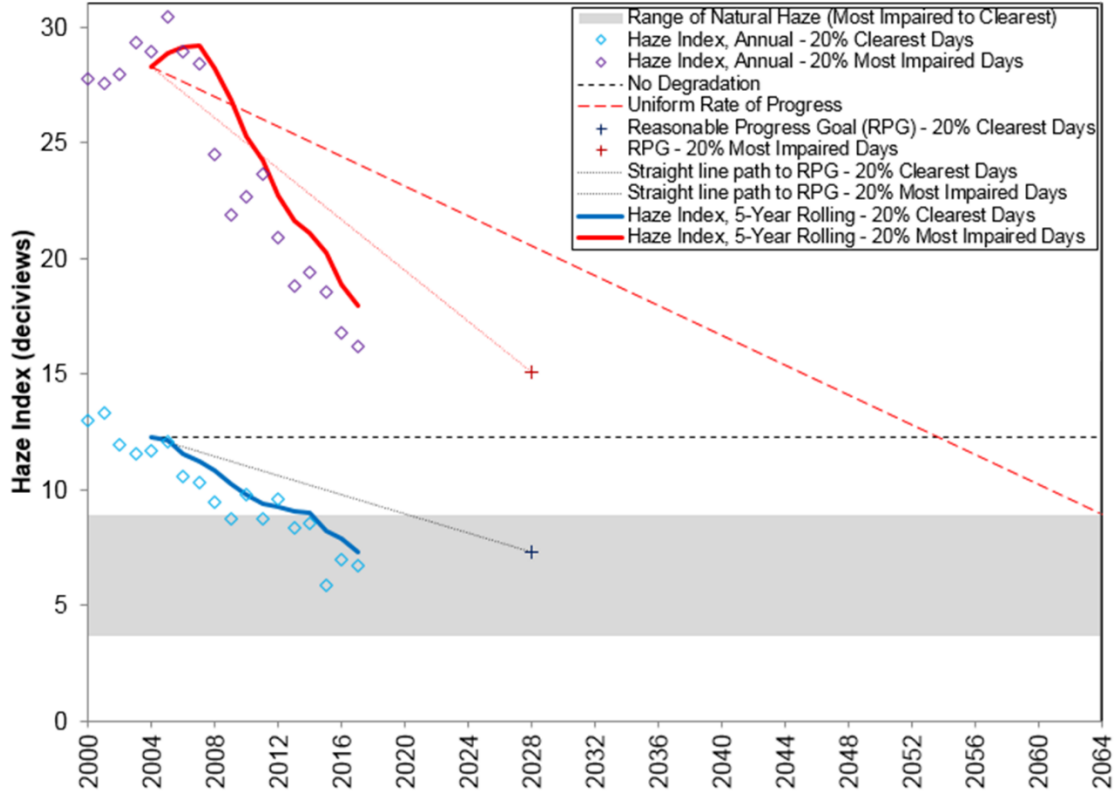


Figure 2-8: Visibility Metrics Levels at Dolly Sods Wilderness Area

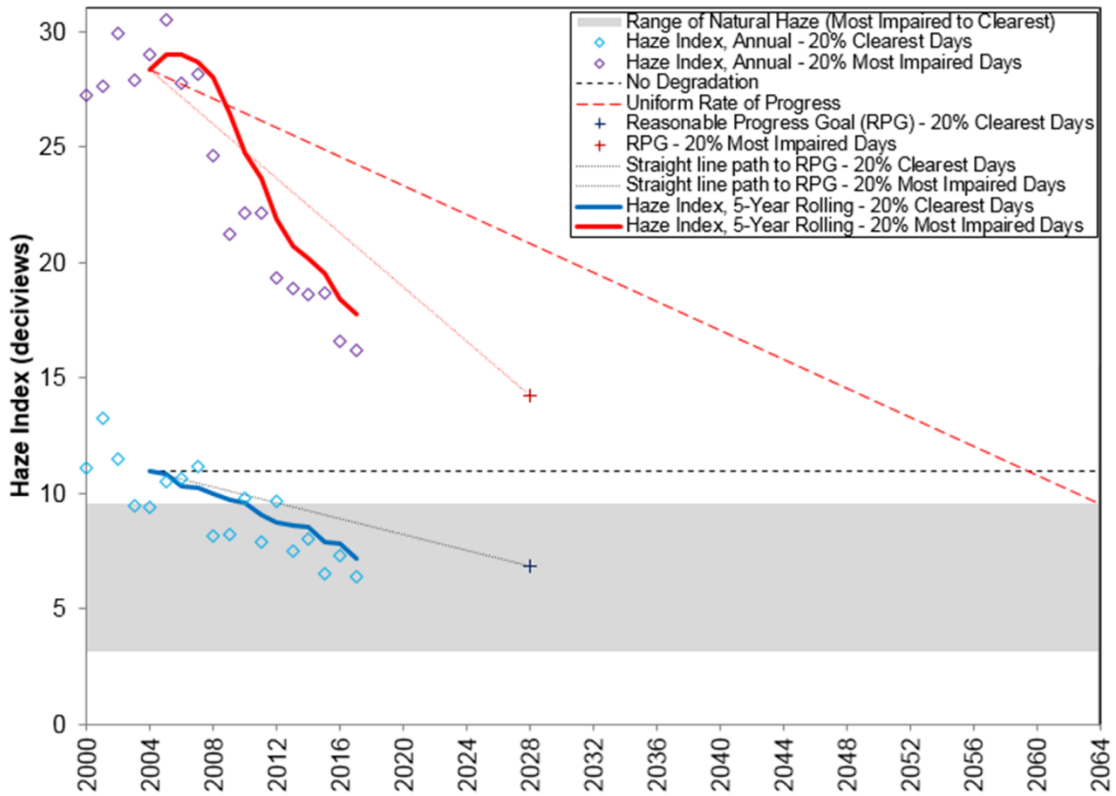


Figure 2-9: Visibility Metrics Levels at Shenandoah National Park

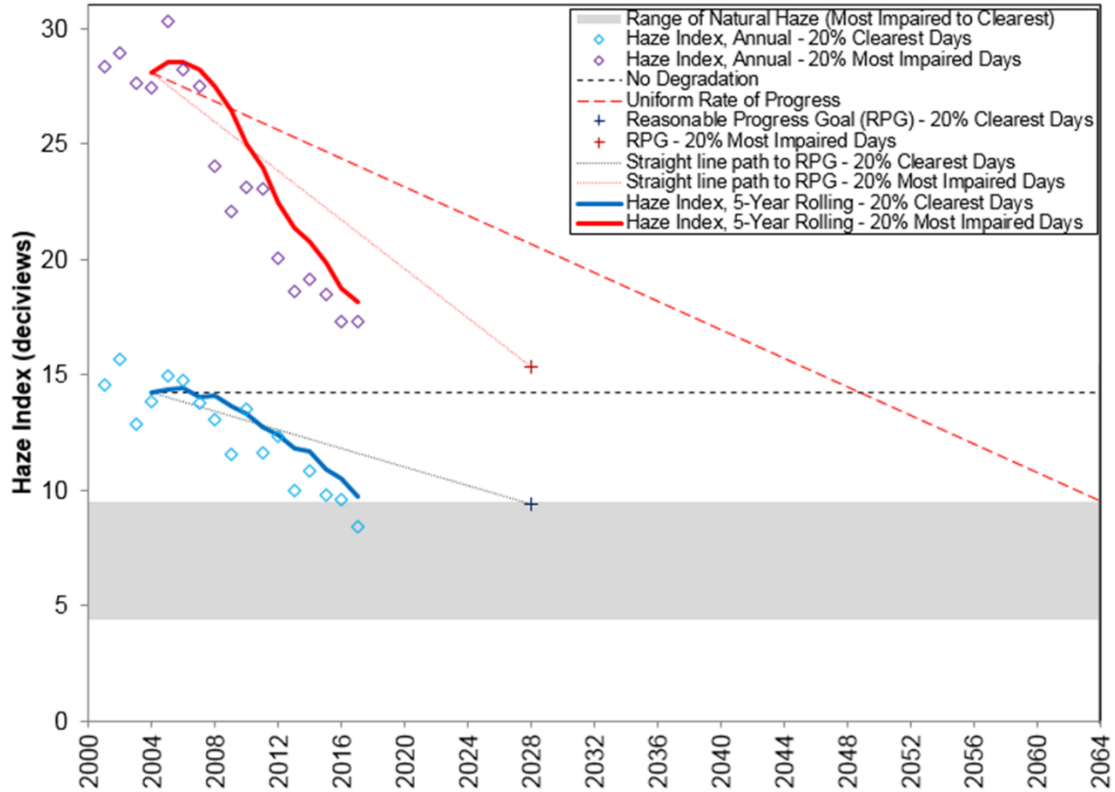


Figure 2-10: Visibility Metrics Levels at James River Face Wilderness

2.23 § 51.308 (g)(7) – Review of Monitoring Strategy

For progress reports for the first implementation period only, a review of the State's visibility monitoring strategy and any modifications to the strategy as necessary.

The District does not have a visibility monitoring strategy because there are no Class I Federal areas within the jurisdiction.

2.24 § 51.308 (g)(8) – Review of Smoke Management Plan

For a state with a long-term strategy that includes a smoke management program for prescribed fires on wildland that conducts a periodic program assessment, a summary of the most recent periodic assessment of the smoke management program including conclusions if any that were reached in the assessment as to whether the program is meeting its goals regarding improving ecosystem health and reducing the damaging effects of catastrophic wildfires.

Section 604 of Title 20 District of Columbia Municipal Regulations prohibits open burning within the District. Being an urban environment, the District does not have a smoke management plan. Additional measures to mitigate the impact on Class I Federal areas of smoke emissions from agricultural and forest fires are not needed in the District's SIP.

2.25 § 51.308 (h) – Adequacy Determination

Determination of the adequacy of existing implementation plan. At the same time the State is required to submit any progress report to EPA in accordance with paragraph (g) of this section, the State must also take one of the following actions based upon the information presented in the progress report:

(1) If the State determines that the existing implementation plan requires no further substantive revision at this time in order to achieve established goals for visibility improvement and emissions reductions, the State must provide to the Administrator a declaration that revision of the existing implementation plan is not needed at this time.

(2) If the State determines that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources in another State(s) which participated in a regional planning process, the State must provide notification to the Administrator and to the other State(s) which participated in the regional planning process with the States. The State must also collaborate with the other State(s) through the regional planning process for the purpose of developing additional strategies to address the plan's deficiencies.

(3) Where the State determines that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources in another country, the State shall provide notification, along with available information, to the Administrator.

(4) Where the State determines that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources within the State, the State shall revise its implementation plan to address the plan's deficiencies within one year.

Based on the analyses presented in Section 2.16 through Section 2.24, the District determines that the existing SIP, as approved by EPA, is adequate for continued reasonable progress towards natural conditions by 2064 in all mandatory Class I Federal areas within 300 km of its borders. The District has no further information indicating that emissions from the District impact any specific Class I Federal area. Therefore, the District provides a negative declaration to the EPA Administrator, specifying that no additional controls are necessary at this time to continue making reasonable progress towards meeting the visibility goals in nearby Class I Federal areas by 2018.

2.26 § 51.308 (i)(2) – Federal Land Manager Consultation

The State must provide the Federal Land Manager with an opportunity for consultation, in person at a point early enough in the State's policy analyses of its long-term strategy emission reduction obligation so that information and recommendations provided by the Federal Land Manager can meaningfully inform the State's decisions on the long-term strategy. The opportunity for consultation will be deemed to have been early enough if the consultation has taken place at least 120 days prior to holding any public hearing or other public comment opportunity on an implementation plan (or plan revision) for regional haze required by this subpart. The opportunity for consultation on an implementation plan (or plan revision) or on a progress report must be provided no less than 60 days prior to said public hearing or public comment opportunity. This

consultation must include the opportunity for the affected Federal Land Managers to discuss their:

(i) Assessment of impairment of visibility in any mandatory Class I Federal area; and

(ii) Recommendations on the development and implementation of strategies to address visibility impairment.

During the MANE-VU consultation process discussed in Section 2.5, opportunities were provided by MANE-VU for FLMs to review and comment on each of the technical documents developed by MANE-VU and included in this SIP. The District has provided agency contacts to the FLMs as required. In the development of this SIP, the FLMs were consulted in accordance with the provisions of 51.308(i)(2). The District has provided the FLMs an opportunity for consultation, in person at least 60 days prior to holding any public hearing on this SIP. This draft SIP was sent to the FLMs on April 10, 2019 for their review and comment (Appendix 15). FLMs were asked to respond by June 11, 2019.

The District will consult with the FLMs on the status of the following implementation items:

1. Implementation of emissions strategies identified in the SIP as contributing to achieving improvement in the most impaired day visibility;
2. Summary of major new source permits issued;
3. Status of State actions to meet commitments for completing any future assessments or rulemakings on sources identified as likely contributors to visibility impairment, but not directly addressed in the most recent SIP revision;
4. Any changes to the monitoring strategy or monitoring stations status that may affect tracking of reasonable progress;
5. Work underway for preparing the 5-year reviews and/or 10-year revisions;
6. Items for FLMs to consider or provide support for, in preparation for any visibility protection SIP revisions (based on a 5-year review or the 10-year revision schedule under the Regional Haze Rule); and
7. Summary of the topics for discussion covered in ongoing communications (meetings, emails, other records) between the State and FLMs regarding implementation of the visibility program.

The consultation will be coordinated with the designated visibility protection program coordinators for the National Park Service, U.S. Fish and Wildlife Service, and the U.S. Forest Service.

The District will provide FLMs with an opportunity to provide comments on future SIP revisions as required by § 51.308(f).

2.27 § 51.308 (i)(3) – Comments from Federal Land Manager Consultation

In developing any implementation plan (or plan revision) or progress report, the State must include a description of how it addressed any comments provided by the Federal Land Managers.

The District has received comments regarding this SIP from the US Forest Service (Appendix 16). The comments received from the US Forest Services were that the draft they received was acceptable and no changes were needed. Neither the National Park Service, nor the US Fish and Wildlife Service provided comments during the consultation period. As a result there was no need for the District to address anything noted by the FLMs specifically in the SIP.

2.28 § 51.308 (i)(4) – Procedures for Continuing Consultation

The plan (or plan revision) must provide procedures for continuing consultation between the State and Federal Land Manager on the implementation of the visibility protection program required by this subpart, including development and review of implementation plan revisions and progress reports, and on the implementation of other programs having the potential to contribute to impairment of visibility in mandatory Class I Federal areas.

§ 51.308(i)(4) requires procedures for continuing consultation between States and FLMs on the implementation of the visibility protection program. The District commits to providing the progress report due on January 31, 2025 to the FLMs as part of continuing consultation and will consult with the FLMs if requested during the next planning period. Given that the emissions from the District do not affect any Class I Federal area and that the District is not reasonably anticipated to contribute to visibility impairment during the second planning period no additional procedures are necessary.

2.29 Appendix V to CFR Part 51 – Legal Authority to Adopt and Implement SIP

Administrative requirements from Appendix V to CFR Part 51 require the District to demonstrate it has legal authority to adopt and implement this SIP. The District has the authority under the District of Columbia Air Pollution Control Act of 1984 (APCA) (D.C. Official Code § 8-101.05(b)(1)(C)) to, “(i) establish cooperative effort and mutual assistance agreements or programs for the prevention and control of air pollution and the enforcement of their respective air pollution laws; and (ii) establish or participate in any organization as may be necessary to carry out these agreements.” The District’s authority under the APCA is delegated to DOEE under the District Department of the Environment Establishment Act of 2005 (D.C. Official Code § 8-151.07) and Mayor’s Order 2006-61 (June 14, 2006). DOEE is not prohibited by any District of Columbia law from revising the SIP as necessary or carrying out any part of the implementation plan.

Section 3 **Conclusion**

This Regional Haze SIP submission demonstrates the authority of the District government to implement the Regional Haze program and that it is undertaking measures deemed to be reasonable during the second implementation period ending in 2028 in order for downwind Class I Federal areas to continue making reasonable progress towards achieving natural visibility condition on the most impaired days by 2064.