Region III Plan Summary

Title: Delaware Redesignation Requests, Associated Maintenance Plans and Motor Vehicle Budgets for the Delaware Portion of the Philadelphia-Wilmington, Pennsylvania-New Jersey-Delaware 1997 Annual Fine Particulate Matter Nonattainment Area and the 2006 24-Hour Fine Particulate Matter Standards and the 2007 Comprehensive Emissions Inventory for the 2006 24-Hour Fine Particulate Matter Standard

Federal Register Dates: August 5, 2014 (final rule) 79 FR 45350; April 11, 2014 (proposed rule) 79 FR 20139

EPA Effective date: September 4, 2014

State Submittal Date: December 12, 2012

Affected Area: Delaware

Summary of the Plan:
The Nonattainment Area is comprised of New Castle County in Delaware (the Delaware portion of the Area); Burlington, Camden, and Gloucester Counties in New Jersey; and Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties in Pennsylvania. *See* 40 CFR 81.308 (Delaware), 40 CFR 81.331 (New Jersey), and 40 CFR 81.339 (Pennsylvania).

In order to be eligible for redesignation to attainment, air quality in the entire Area must meet the NAAQS. All ambient air quality monitors in the Area must meet the NAAQS. On May 16, 2012 (77 FR 28782) and January 7, 2013 (78 FR 882), EPA made determinations that the entire Philadelphia Area had attained the 1997 annual and 2006 24-hour $PM_{2.5}$ NAAQS, respectively. EPA's analysis of the ambient air quality data to support those rulemakings is contained in the technical support documents (TSDs) that EPA prepared for those rulemaking actions. The TSDs are attached.

EPA has found that the Delaware portion of the Area met the requirements for redesignation of the 1997 annual and the 2006 24-hour $PM_{2.5}$ NAAQS under section 107(d)(3)(E) of the CAA. EPA approved Delaware's requests to change the legal designation of the Delaware portion of the Area from nonattainment to attainment for both the 1997 annual and 2006 24-hour $PM_{2.5}$ NAAQS.

EPA approved the associated maintenance plans for the Delaware portion of the Area as revisions to the Delaware SIP for the 1997 annual and 2006 24-hour $PM_{2.5}$ NAAQS, including the motor vehicle emissions budgets (MVEBs) for the Delaware portion of the Area for both the 1997 annual and the 2006 24-hour $PM_{2.5}$ standards.

States are required to submit ambient air quality data into EPA's Air Quality System (AQS). The following tables summarize the AQS data for the Philadelphia Area for the calendar years 2009 – 2019. All data are quality assured and certified by the States of Delaware and New Jersey, and the Commonwealth of Pennsylvania.

Table 1. Annual Mean $PM_{2.5}$ Concentrations for the Philadelphia Area, in micrograms per cubic meter ($\mu g/m^3$)

State	County	Monitor	Yearly Annual Mean			
			2009	2010	2011	2012
Delaware	New Castle	100031003	10.2	10.2	9.4	9.3
		100031007	9.96	10.0	8.8	8.5
		100031012	10.6	10.4	10.4	9.4
		100032004	11.2	10.6	10.3	10.3
New Jersey	Camden	340070002				9.7
		340071007	9.5	9.5	10.1	9.0
	Gloucester	340150004	9.3	9.1	9.4	9.4
Pennsylvania	Bucks	420170012	10.8	10.5	11.5	10.7
	Chester	420290100	14.1	13.8	13.3	9.8
	Delaware	420450002	12.3	13.5	12.9	12.8
	Montgomery	420910013	10.4	9.5	10.3	9.7
	Philadelphia	421010004	10.8	10.7	13.1	16.4
		421010024	9.9	9.6		
		421010047	11.1	11.0	11.4	10.2
		421010055	11.3	11.3	11.4	10.3
		421010057	11.1	10.9	11.4	10.1
		421011002			9.0	10.3

Table 2. 98th Percentile 24-hour $PM_{2.5}$ Concentrations for the Philadelphia Area (µg/m^3)

State	County	Monitor	98th Percentile 24-hour $PM_{2.5}$ Concentrations			
			2009	2010	2011	2012
Delaware	New Castle	100031003	23.2	24.3	22.4	21.5
		100031007	20.6	27.5	21.0	21.1
		100031012	23.4	24.9	22.2	21.3
		100032004	28.4	27.9	24.7	24.2
New Jersey	Camden	340070002				21.5
		340071007	25.0	23.4	24.3	19.8
	Gloucester	340150004	21.9	21.6	22.2	21.8
Pennsylvania	Bucks	420170012	25.8	28.3	29.7	28.2
	Chester	420290100	31.1	35.1	33.8	24.1
	Delaware	420450002	27.9	32.8	28.6	31.1
	Montgomery	420910013	27.2	25.9	27.6	21.8
	Philadelphia	421010004	25.9	27.6	29.6	31.4
		421010024	25.5	25.2		
		421010047	27.2	27.6	27.5	21.8
		421010055	28.6	28.9	30.6	24.8
		421010057	28.3	27.9	30.5	23.3
		421011002			27.5	28.7

C. EPA Evaluation

EPA has reviewed the ambient air quality $PM_{2.5}$ monitoring data in the Philadelphia Area, consistent with the requirements contained at 40 CFR part 50, and recorded in AQS.

Table 3. Three year Average of the Annual Mean $PM_{2.5}$ Concentrations for the Philadelphia Area (µg/m^3)

State	County	Monitor	2009-2011	2010-2012	Preliminary 2011-2013
	New Castle	100031003	9.9	9.6	9.1
		100031007	9.6	9.1	8.4
		100031012	10.5	10.1	9.7
		100032004	10.7	10.4	9.9
New Jersey	Camden	340070002		9.7	9.9
		340071007	9.7	9.5	9.3
	Gloucester	340150004	9.3	9.3	9.3
Pennsylvania	Bucks	420170012	10.9	10.9	10.8
	Chester	420290100	13.7	12.3	11.1
	Delaware	420450002	12.7	13.1	12.3
	Montgomery	420910013	10.1	9.8	9.7
	Philadelphia	421010004	10.1	9.8	9.8
		421010024	9.8	9.6	
		421010047	11.2	10.9	10.5
		421010055	11.4	11.0	10.9
		421010057	11.1	10.8	10.5
		421011002	9.0	9.6	9.6
Area's Annual Design Value			**13.7**	**13.1**	**12.3**

Table 4. Three year Average of the 98th Percentile 24-hour $PM_{2.5}$ Concentrations for the Philadelphia Area (µg/m^3)

State	County	Monitor	2009-2011	2010-2012	Preliminary 2011-2013
	New Castle	100031003	23	23	23
		100031007	23	23	21
		100031012	24	23	24
		100032004	27	26	24
New Jersey	Camden	340070002		22	25
		340071007	24	23	21
	Gloucester	340150004	22	22	23
Pennsylvania	Bucks	420170012	28	29	29
	Chester	420290100	33	31	28
	Delaware	420450002	30	31	29
	Montgomery	420910013	27	25	24
	Philadelphia	421010004	26	24	24
		421010024	25	25	
		421010047	27	26	25
		421010055	29	28	28
		421010057	29	27	26
		421011002	19	27	29
Area's 24-Hour Design Value			**33**	**31**	**29**

Notes:

- 421010024 is incomplete for both standards in 2011 and 2012 because the monitor was shut down January 1, 2011.
- 421011002 is incomplete for both standards in 2011 and 2012 because it did not begin to operate until June 1, 2010. The monitors at this site were relocated to 421010048 permanently on October 8, 2013 because of a construction issue at 421011002 site.
- 420290100 has an incomplete 2011 design values for the 2006 standard.
- 340070002 started operating April 21, 2012.
- 420450002 has an incomplete 2012 design values for the 2006 standard.

Emission Inventories:

EPA has reviewed the 2007, 2008, 2017 and 2025 inventories and supporting documentation submitted with Delaware's redesignation requests and maintenance plans for the 1997 annual and 2006 24-hour $PM_{2.5}$ NAAQS, and determined that they are approvable. See "Technical Support Document (TSD) for the Redesignation Request and Maintenance Plan for the New Castle County Portion of the Philadelphia-Wilmington, PA-NJ-DE 1997 $PM_{2.5}$ Nonattainment Area" and "Technical Support Document (TSD) for the Redesignation Request and Maintenance Plan for the New Castle County Portion of the Philadelphia-Wilmington, PA-NJ-DE 2006 $PM_{2.5}$ Nonattainment Area" prepared by the EPA Region III Office of Air Monitoring and Analysis and both dated January 28, 2014, ("Inventory TSDs").

The inventory summaries in the narrative portions of DNREC's redesignation requests and maintenance plans only contain emissions data for direct $PM_{2.5}$, NOx and SO_2 for the Delaware portion of the Philadelphia Area. Tables 5a, 5b, and 5c contain data from Tables 8-2, 8-3 and 8-4 in Section 8.2.1 of Delaware's maintenance plan for the 1997 annual $PM_{2.5}$ NAAQS. However, the underlying emissions data DNREC submitted to support DNREC's inventories include emissions data for the entire Philadelphia area. The 2007, 2017 and 2025 inventories that DNREC used for its 1997 annual $PM_{2.5}$ maintenance plans were developed through the Mid-Atlantic Regional Air Management Association (MARAMA) regional planning process. DNREC submitted the MARAMA data and TSDs as part of the redesignation requests and maintenance plans. In order to evaluate maintenance of the 1997 annual $PM_{2.5}$ for the entire Philadelphia Area, EPA has extracted 2007, 2017 and 2025 MARAMA data for the entire Philadelphia Area, including the New Jersey and Pennsylvania portions, which was not included in DNREC's redesignation request and maintenance plan narrative. That data is summarized in Tables 6a, 6b, and 6c. Note that the emission projections for the Delaware portion of the Area contain subcategories for point source and non-road emissions sources. "Non-road, MAR" refers to Marine Vessels, Aircraft and Locomotives (MAR). "Non-road, NMIM" refers to emissions sources covered by the National Mobile Inventory Model (NMIM). Point source emissions are reported as either from electric generating units (EGUs) or from non-EGU point sources.

Table 5a. Comparison of 2007, 2017, and 2025 Emissions of Direct $PM_{2.5}$ for the Delaware Portion of the Philadelphia Area, in tons per year (tpy)

Direct $PM_{2.5}$							
Sector	**2007**	**2017**	**2025**	**2007-2017**		**2007-2025**	
				Reduction	**Percent Reduction**	**Reduction**	**Percent Reduction**
Non-point	1,207	1,235	1,310	-28	-2.3%	-103	-8.5%
Non-road, MAR	171	61	44	110	64.2%	126	74.0%
Non-road, NMIM	156	106	103	51	32.5%	53	34.0%
On-road	324	199	199	125	38.6%	125	38.6%
Point, EGU	519	502	520	17	3.2%	-1	-0.2%
Point, non-EGU	816	742	716	75	9.1%	100	12.2%
Total	**3,193**	**2,844**	**2,893**	**349**	**11%**	**301**	**9%**

Table 5b. Comparison of 2007, 2017, and 2025 Emissions of NO_X for the Delaware Portion of the Philadelphia Area (tpy)

NOx							
Sector	**2007**	**2017**	**2025**	**2007-2017**		**2007-2025**	
				Reduction	**Percent Reduction**	**Reduction**	**Percent Reduction**
Non-point	1,293	1,295	1,296	-3	-0.2%	-3	-0.2%
Non-road, MAR	2,825	1,810	1,279	1,015	35.9%	1,546	54.7%
Non-road, NMIM	1,755	997	837	758	43.2%	918	52.3%
On-road	10,577	6,273	6,273	4,304	40.7%	4,304	40.7%
Point, EGU	2,865	1,698	1,758	1,167	40.7%	1,107	38.7%
Point, non-EGU	3,770	2,402	2,355	1,368	36.3%	1,415	37.5%
Total	**23,084**	**14,475**	**13,797**	**8,609**	**37%**	**9,287**	**40%**

Table 5c. Comparison of 2007, 2017, and 2025 Emissions of SO_2 for the Delaware Portion of the Philadelphia Area (tpy)

SO_2							
Sector	**2007**	**2017**	**2025**	**2007-2017**		**2007-2025**	
				Reduction	**Percent Reduction**	**Reduction**	**Percent Reduction**
Non-point	630	521	469	109	17.4%	161	25.6%

Non-road, MAR	1,027	112	37	915	89.1%	990	96.4%
Non-road, NMIM	91	2	3	89	97.3%	88	96.5%
On-road	100	98	98	2	2.4%	2	2.4%
Point, EGU	9,119	2,419	2,572	6,700	73.5%	6,547	71.8%
Point, non-EGU	4,261	3,843	3,780	418	9.8%	482	11.3%
Total	**15,228**	**6,995**	**6,958**	**8,234**	**54%**	**8,271**	**54%**

Attainment Demonstration

EPA has reviewed sections 4.3 of both redesignation requests and maintenance plans and found that DNREC has demonstrated that it has controlled emissions of $PM_{2.5}$ and its precursors through numerous permanent and enforceable emission control measures, resulting in permanent and enforceable emission reductions adequate to attain both the 1997 annual and 2006 24-hour $PM_{2.5}$ NAAQS. Therefore, DNREC has met this criterion for redesignation. However, in a separate rulemaking action, published on February 22, 2013, EPA identified deficiencies associated with several regulations within the approved Delaware SIP including a specific provision within 7-1100-1142 Del. Code Regs § 2 (Regulation 1142, Section 2.0, Control of Nitrogen Oxide (NOx) Emissions from Industrial Boilers and Process Heaters at Petroleum Refineries). *See* 78 FR 12460, February 22, 2013. In that proposed rulemaking action, EPA identified specific Delaware regulations in which state officials are provided unbounded discretion to set alternative emission limits during periods of start-up and shutdown of equipment through a permitting process that does not entail subsequent approval of the alternative emission limits through a SIP submission. EPA has proposed to find that this process constitutes an impermissible director's discretion provision with the potential to allow impermissible discretionary exemptions from SIP emission limits. *See* 78 FR 12495-12496. EPA will be taking a separate final action on the February 22, 2013 proposed rulemaking action.

EPA's analysis indicates that Regulation 1142, Section 2.0 is not necessary for attainment of the Philadelphia Area. The Philadelphia Area is attaining the 1997 annual and 2006 24-hour $PM_{2.5}$ NAAQS. The Philadelphia Area came into attainment of the 1997 annual NAAQS in 2009, considering 2007-2009 ambient air quality monitoring data (77 FR 28782), and continues to meet that standard. The Philadelphia Area came into attainment for the 2006 24-hour standard in 2010, considering 2008-2010 data (78 FR 882), and continues to meet that standard. The current annual design value for the Philadelphia Area is 13.1 micrograms per cubic meter (µg/m3), based on 2010-2012 data. The 1997 $PM_{2.5}$ annual NAAQS is 15.0 $\mu g/m^3$ based on a 3-year average of annual mean $PM_{2.5}$ concentrations. The current 24-hour design value for the Philadelphia Area is 31 $\mu g/m^3$, based on 2010-2012 data. The 1997 $PM_{2.5}$ annual NAAQS is 15.0 $\mu g/m^3$ based on a 3-year average of annual mean $PM_{2.5}$ concentrations. The level of the 2006 24-hour NAAQS for PM2.5 is 35 $\mu g/m^3$ based on a 3-year average 98th percentile of 24-hour concentrations. Preliminary, uncertified 2011-2013 design values are 12.3 $\mu g/m^3$ and 29 $\mu g/m^3$ for the annual and 24-hour standards, respectively. Furthermore, actual emissions of $PM_{2.5}$ and its precursors have been achieved between the base years and the attainment years for both standards. For the 1997 NAAQS, NOx has decreased in the Delaware portion of the Philadelphia Area from 30,748 tpy in 2002 to 23,084 tpy in 2007. For the 2006 NAAQS, NOx

has decreased in the Delaware portion of the Philadelphia Area from 23,084 tpy in 2007 to 20,504 tpy in 2008.

Regulation 1142 Section 2.0 applies to NOx emissions at petroleum refineries, but there is only one such petroleum refinery in Delaware. The source is separately subject to a federally-enforceable consent decree and several consent decree addendums between the source and EPA which limit NOx emissions and require NOx control measures at several units at the refinery. In addition, the source has a federally-enforceable permit which limits NOx emissions at the source to 2,525 tpy of NOx.

Therefore, EPA is not relying upon on Regulation 1142 Section 2.0 in its evaluation of the permanent and enforceable attainment measures. Through numerous permanent and enforceable regulations, which are incorporated into Delaware's SIP, Delaware has regulated and is continuing to regulate sources of $PM_{2.5}$ and its precursors in the Philadelphia Area. Taking into consideration the existing regulations, including those listed above, which Delaware included in Sections 4.3 of its redesignation requests and maintenance plans, (with the exception of Regulation 1142 Section 2.0), and EPA has concluded that the Philadelphia Area has attained the 1997 and 2006 $PM_{2.5}$ NAAQS through permanent and enforceable emission reductions.

Maintenance Demonstration

Delaware included Regulation 1142, Section 2.0, Control of Nitrogen Oxide (NOx) Emissions from Industrial Boilers and Process Heaters at Petroleum Refineries, in that list. However, as explained above, Regulation 1142, Section 2.0 is the subject of a separate proposed rulemaking action, published on February 22, 2013 (78 FR 12460). Therefore, EPA has conducted an analysis to determine if the area can demonstrate maintenance without emission reductions from that regulation.

Delaware has determined that 1142, Section 2.0, also known as the Delaware City Refinery NOx Cap, achieves 1,157.26 tons of NOx reductions between 2007 and 2025, and 874.7 tons of NOx reductions between 2008 and 2025. (See Tables 8.6 of Delaware's redesignation requests for the 1997 annual and 2006 24-hour $PM_{2.5}$ NAAQS, respectively.)

Table 10. Maintenance Demonstration, Not Considering Emission Reductions from Delaware Regulation 1142

1997 annual $PM_{2.5}$ NAAQS NOx (tons)			**2006 24-hour $PM_{2.5}$ NAAQS NOx (tons)**	
2025 Maintenance Year	81,868		2025 Maintenance Year	73,640
Plus Reductions from Regulation 1142, Section 2	1,157.26		Plus Reductions from Regulation 1142, Section 2	874.7
Adjusted 2025	**83,025**		Adjusted 2025	**74,515**
	is less than			is less than

2007 Attainment Year	**187,967**		2008 Attainment Year	**147,247**

In both cases, the adjusted 2025 NOx emissions are well below the attainment year emissions. Therefore, Regulation 1142, Section 2 is not needed for maintenance of either the 1997 annual or 2006 24-hour $PM_{2.5}$ NAAQS. Therefore, EPA is not relying upon on Regulation 1142 Section 2.0 in its evaluation of Delaware's maintenance plans for the 1997 annual or 2006 24-hour $PM_{2.5}$ NAAQS.

Table 6a. Comparison of 2007, 2017, and 2025 Emissions of Direct $PM_{2.5}$ for the Entire Philadelphia Area (tpy)

Direct $PM_{2.5}$				
Data Category		**2007**	**2017**	**2025**
Point	Non-EGU	3,524.67	2,993.04	3,062.22
	EGU	1,048.27	831.89	812.59
	Total point	**4,572.94**	**3,824.92**	**3,874.81**
Non-point		**17,879.16**	**13,358.07**	**12,982.59**
Non-road	Non-road-NMIM	1,807.72	1,290.41	1,058.68
	Non-road-MAR	658.42	315.65	298.52
	Total non-road	**2,466.14**	**1,606.07**	**1,357.20**
On-road		**3,794.55**	**2,488.03**	**1,442.82**
Total $PM_{2.5}$		**28,712.79**	**21,277.09**	**19,657.43**

Table 6b. Comparison of 2007, 2017, and 2025 Emissions of SO_2 for the Entire Philadelphia Area (tpy)

NOx				
Data Category		**2007**	**2017**	**2025**
Point	NonEGU	19,142.68	7,950.06	14,944.05
	EGU	12,616.37	5,098.96	4,873.40
	Total point	**31,759.05**	**13,049.02**	**19,817.45**
Non-point		**18,043.03**	**17,528.04**	**17,741.46**
Non-road	Non-road-NMIM	19,578.72	10,732.32	8,304.53
	Non-road-MAR	12,270.83	10,202.71	9,357.43
	Total non-road	**31,849.56**	**20,935.02**	**17,661.96**
On-road		**106,315.36**	**62,055.50**	**26,647.62**
Total NOx		**187,967.00**	**113,567.59**	**81,868.48**

Table 6c. Comparison of 2007, 2017, and 2025 Emissions of NOx for the Entire Philadelphia Area (tpy)

SO_2				
Data Category		**2007**	**2017**	**2025**
Point	NonEGU	14,370.12	8,981.21	8,990.19
	EGU	20,664.80	4393.71	4,562.97
	Total point	**35,034.92**	**13,374.93**	**13,553.16**
Non-point		**16,763.17**	**13,466.12**	**9,755.89**

Non-road	Non-road-NMIM	998.23	29.02	32.54
	Non-road-MAR	5,135.86	822.21	676.71
	Total non-road	**6,134.09**	**851.24**	**709.25**
On-road		**772.55**	**577.71**	**421.84**
Total SO_2		**58,704.72**	**28,270.00**	**24,440.14**

For the 2008 24-hour $PM_{2.5}$ redesignation request, DNREC developed a 2008 attainment year inventory for the Delaware portion of the Philadelphia Area, New Castle County. DNREC then developed projected 2017 and 2025 inventories, based on the 2008 inventory for New Castle County. Tables 7a, 7b, and 7c contain data from Tables 8-2, 8-3 and 8-4 in Section 8.2.1 of Delaware's maintenance plan for the 2006 24-hour $PM_{2.5}$ NAAQS. In order to evaluate maintenance of the 2006 24-hour $PM_{2.5}$ for the entire Philadelphia Area, EPA pulled data for the Pennsylvania and New Jersey portions of the Area from EPA's 2008 National Emissions Inventory, version 3 (2008 v3 NEI). EPA then compared the 2008 and 2007 inventories for the entire Philadelphia Area. EPA took the percent difference between the 2008 and 2007 inventories and applied that percent difference to the 2017 and 2025 MARAMA inventories, in order to extrapolate the 2017 and 2025 projected inventories for the entire Philadelphia Area. That data is summarized in Tables 8a, 8b, and 8c.

Table 7a. Comparison of 2008, 2017, and 2025 Emissions of Direct $PM_{2.5}$ for the Delaware Portion of the Philadelphia Area (tpy)

Direct $PM_{2.5}$							
Sector	**2008**	**2017**	**2025**	**2008-2017**		**2008-2025**	
				Reduction	**Percent Reduction**	**Reduction**	**Percent Reduction**
Non-point	1,191	1,247	1,327	-56	-4.7%	-136	-11.4%
Non-road, MAR	164	59	42	106	64.3%	122	74.3%
Non-road, NMIM	148	106	103	42	28.6%	45	30.2%
On-road	282	199	199	83	29.4%	83	29.4%
Point, EGU	396	410	427	-14	-3.5%	-32	-8.0%
Point, non-EGU	713	504	398	209	29.3%	315	44.1%
Total	**2,894**	**2,524**	**2,497**	**370**	**13%**	**396**	**14%**

Table 7b. Comparison of 2008, 2017, and 2025 Emissions of NO_X for the Delaware Portion of the Philadelphia Area (tpy)

NOx							
Sector	2008	2017	2025	2008-2017		2008-2025	
				Reduction	Percent Reduction	Reduction	Percent Reduction
Non-point	1,287	1,299	1,297	-12	-0.9%	-10	-0.8%
Non-road, MAR	2,641	1,760	1,247	881	33.3%	1,394	52.8%
Non-road, NMIM	1,676	997	837	679	40.5%	840	50.1%
On-road	9,311	6,273	6,273	3,038	32.6%	3,038	32.6%
Point, EGU	2,185	1,629	1,707	556	25.4%	478	21.9%
Point, non-EGU	3,404	1,724	1,421	1,680	49.4%	1,983	58.3%
Total	**20,504**	**13,682**	**12,782**	**6,822**	**33%**	**7,722**	**38%**

Table 7c. Comparison of 2008, 2015, and 2025 Emissions of SO_2 for the Delaware Portion of the Philadelphia Area (tpy)

SO_2							
Sector	2008	2017	2025	2008-2017		2008-2025	
				Reduction	Percent Reduction	Reduction	Percent Reduction
Non-point	402	336	286	66	16.5%	116	28.8%
Non-road, MAR	1,039	120	39	919	88.4%	1,000	96.2%
Non-road, NMIM	28	2	3	25	91.0%	25	88.4%
On-road	94	98	98	-3	-3.4%	-3	-3.4%
Point, EGU	7,122	2,017	2,161	5,104	71.7%	4,960	69.7%
Point, non-EGU	3,454	2,559	2,096	895	25.9%	1,358	39.3%
Total	**12,139**	**5,132**	**4,683**	**7,007**	**58%**	**7,456**	**61%**

Table 8a. Comparison of 2008, 2017, and 2025 Emissions of Direct $PM_{2.5}$ for the Entire Philadelphia Area (tpy)

$PM_{2.5}$			
Data Category	**2008**	**2017**	**2025**
Point	4,789.659	3,824.92	3,874.81
Non-point	1,1935.36	13,358.07	12,982.59
Non-road	1,727.685	1,606.07	1,357.20
On-road	2,436.669	2,488.03	1,442.82
Total $PM_{2.5}$	**20,889.37**	**21,277.09**	**19,657.43**

Table 8b. Comparison of 2008, 2017, and 2025 Emissions of NOx for the Entire Philadelphia Area (tpy)

NOx			
Data Category	**2008**	**2017**	**2025**
Point	31,233.06	13,049.02	19,817.45
Non-point	23,476.91	17,528.04	17,741.46
Non-road	25,905.46	20,935.02	17,661.96
On-road	6,6631.3	62,055.50	26,647.62
Total NOx	**14,7246.7**	**11,3567.6**	**81,868.48**

Table 8c. Comparison of 2008, 2017, and 2025 Emissions of SO_2 for the Entire Philadelphia Area (tpy)

SO_2			
Data Category	**2008**	**2017**	**2025**
Point	29,340.17	13,374.93	13,553.16
Non-point	17,015.83	13,466.12	9,755.89
Non-road	5,312.462	851.24	709.25
On-road	416.2945	577.71	421.84
Total SO_2	**5,2084.76**	**28,270.00**	**24,440.14**