Region III Plan Summary
Delaware Portion of the Philadelphia-Wilmington-Atlantic City
8-Hour Ozone Moderate Nonattainment Area

Title: Rate of Progress (ROP) Plan for the Delaware Portion of the Philadelphia-Wilmington-Atlantic City 1997 8-Hour Ozone Moderate Nonattainment Area

Federal Register Dates: January 15, 2010, 75 FR 2452 (Proposed Rule); April 8, 2010, 75 FR 17863 (Final Rule)

EPA Effective date: May 10, 2010

State Submittal Date: June 13, 2007

Affected Area: Entire State (Kent, New Castle, and Sussex Counties)

Summary of the Plan:

On June 13 2007, the Delaware Department of Natural Resources and Environmental Control (DNREC) submitted a SIP revision addressing emissions inventory, reasonably available control measures (RACM), contingency measures, and reasonable further progress (RFP) requirements for the 1997 8-hour ozone national ambient air quality standard (NAAQS) for the Delaware portion of the Philadelphia moderate nonattainment area. The SIP revision also establishes a motor vehicle emissions budget (MVEB) for 2008.

Pursuant to Phase 1 of the 8-hour ozone implementation rule, published on April 30, 2004 (69 FR 23951), an area was classified under Subpart 2 of the CAA based on its 8-hour design value if that area had a 1-hour design value at or above 0.121 ppm (the lowest 1-hour design value in Table 1 of Subpart 2). Based on this criterion, Delaware, as part of the Philadelphia area was classified under Subpart 2 as a moderate nonattainment area.

Emission Inventories:

Delaware submitted its 2002 base year emissions inventory on June 13, 2007. A summary of the 2002 base year VOC and NOx emissions inventory are included in Tables 1 and 2 in this document.

Table 1. Delaware 2002 Base Year VOC Emissions in tons per day (tpd)

Source Sector	Kent	New Castle	Sussex	State Total
Point	0.49	9.42	13.35	23.26
Stationary Area	5.75	20.02	7.31	33.08
Non-Road Mobile	5.17	12.24	9.36	26.77
On-Road Mobile	5.45	16.98	9.95	32.38
Total Emissions	**16.86**	**58.66**	**39.97**	**115.49**

Table 2. Delaware 2002 Base Year NOx Emissions in tpd

Source Sector	Kent	New Castle	Sussex	State Total
Point	5.06	44.09	24.95	74.10
Stationary Area	0.45	1.95	0.77	3.17
Non-Road Mobile	15.02	24.62	13.15	52.79
On-Road Mobile	13.97	36.56	18.50	69.03
Total Emissions	**34.50**	**107.22**	**57.37**	**199.09**

Adjusted Base Year Inventory and 2008 RFP Target Levels

For moderate areas like Delaware, the CAA specifies a 15 percent reduction in ozone precursor emissions over an initial 6-year period. The RFP SIP revision must provide for a 15 percent emission reduction (either NOx and/or VOC) accounting for any growth that occurs during the 6-year period following the baseline emissions inventory year, that is, 2002-2008.

According to EPA's Phase 2 Implementation Rule (70 FR 71612), Delaware must achieve 15 percent VOC emission reduction in Sussex County from its 2002 baseline level, and 15 percent VOC and/or NOx emission reduction in Kent and New Castle Counties from their combined 2002 baseline level before the end of 2008.

According to the CAA, emission reductions that resulted from the Federal Motor Vehicle Control Program (FMVCP**)** and Reid Vapor Pressure (RVP**)** rules promulgated prior to 1990 are not creditable for achieving RFP emission reductions. Therefore, the 2002 base year inventory is adjusted by subtracting the VOC and NOx emission reductions that are expected to occur between 2002 and the future milestone years due to the FMVCP and RVP rules. The FMVCP/RVP VOC and NOx emission reductions that are expected between 2002 and 2008 were determined using EPA's MOBILE6.2 model. The adjustments are presented in Table 3 for Sussex County and Table 4 for Kent and New Castle Counties.

Table 3. Mobile Source FMVCP/RVP Adjustments for Sussex County in tpd

Adjusted On-Road Mobile Source Emissions	VOC	NOx	Note
Adjusted for 2002	16.66	20.24	A
Adjusted for 2008	15.51	18.81	B_{2008}
Mobile Source Adjustments for 2002 Baseline			
2002-2008	1.15	1.42	$C_{2008} = A - B_{2008}$

Table 4. Mobile Source FMVCP/RVP Adjustments for Kent & New Castle Counties in tpd

Adjusted On-Road Mobile Source Emissions	VOC	NOx	Note
Adjusted for 2002	42.16	56.02	a
Adjusted for 2008	39.18	51.64	b_{2008}
Mobile Source Adjustments for 2002 Baseline			
2002-2008	2.98	4.38	$c_{2008} = a - b_{2008}$

The mobile source adjustments in Tables 3 and 4 are the non-creditable emission reductions due to the pre-1990 FMVCP and RVP rules. Subtracting these adjustments from the 2002 base year emissions inventory will give the 2002 adjusted base year emissions inventory relative to the subject milestone year, as presented in Table 5 for Sussex County and Table 6 for Kent and New Castle Counties.

Table 5. The 2002 Adjusted Base Year Emissions Inventory for Sussex County in tpd

	VOC	**NOx**	Note
2002 Base Year Emissions Inventory	39.97	57.37	E
Mobile Source Adjustments for 2002-2008	1.15	1.42	C_{2008}
2002 Adjusted Baseline Relative to 2008	38.82	55.95	$F_{2008} = E - C_{2008}$

Table 6. The 2002 Adjusted Base Year Emissions Inventory for Kent & New Castle Counties in tpd

	VOC	**NOx**	Note
2002 Base Year Emissions Inventory	75.52	141.72	e
Mobile Source Adjustments for 2002-2008	2.98	4.38	c_{2008}
2002 Adjusted Baseline Relative to 2008	72.54	137.34	$f_{2008} = e - c_{2008}$

By the end of 2008, Delaware is required to reduce 15 percent in its 2002 adjusted base year emissions inventory. According to the Phase 2 rule (70 FR 71612), Sussex County must achieve this 15 percent reduction in its VOC emission, since it did not have a 15 percent VOC ROP plan approved by EPA under the 1-hour ozone standard. For Kent and New Castle Counties, their 15 percent emission reductions can be achieved from VOC emissions and/or from NOx emissions.

The 15 percent VOC emission reduction and emission target in 2008 in Sussex County are calculated as follows:

Sussex 2002 adjusted VOC baseline relative to 2008 is 38.82 tpd.

Required 15 percent emission reduction: 38.82 x 15% = 5.82 tpd.

2008 VOC emission target: 38.83 – 5.82 = 33.00 tpd.

The 15 percent VOC emission reduction and emission target in 2008 in Kent and New Castle Counties are calculated as follows:

Kent/New Castle 2002 adjusted VOC baseline relative to 2008 is 72.54 tpd.

Required 15 percent emission reduction: 72.54 x 15% = 10.88 tpd.

2008 VOC emission target: 72.54 – 10.88 = 61.66 tpd.

Control Measures/Regulations Included As Part of the Plan (tons per day) and Expected Emissions Reductions

The only post-2002 point source VOC control in Sussex County is Regulation No. 24, Section 46, Control of Crude Oil Lightering Operations. Since there were no new VOC controls for point sources, non-point source sector, and non-road mobile source sector for VOC emissions between 2008 and 2009, Delaware's 2008 emission reductions and projections are estimated by interpolating the 2002 base year emissions and the 2009 projections. Kent and New Castle Counties applied for and obtained total VOC and NOx emission reductions from facility/unit shutdown or modification. The 2008 on-road mobile source VOC emissions were projected using EPA's MOBILE6.2 for obtaining factors and the Peninsula Travel Demand Model (PTDM) for predicting future vehicle miles traveled (VMT). Tables 7 and 8 summarize the total 2008 VOC emission projection for the RFP requirements for Sussex County, and Kent and New Castle Counties, respectively.

Table 7. Sussex County Total VOC Emission Projection in tpd

Point Source Sector	10.71
Area Source Sector	6.32
Non-Road Mobile Sector	8.01
On-Road Mobile Sector	7.09
Total 2008 Emission Projection	**32.13**

The total VOC emission projection meets the 2008 emission target under the 15 percent RFP requirements (33.00 tpd). Therefore, the 2008 RFP in Sussex County is demonstrated.

Table 8. Kent & New Castle Counties Total VOC Emission Projection in tpd

Point Source Sector	10.51
Area Source Sector	21.64
Non-Road Mobile Sector	13.81
On-Road Mobile Sector	14.75
Total 2008 Emission Projection	**60.71**

The total VOC emission projection meets the 2008 emission target under the 15 percent RFP requirements (61.66 tpd). Therefore, the 2008 RFP in Kent and New Castle Counties is demonstrated.

Contingency Measures

The CAA requires States with moderate and above ozone nonattainment areas to include-sufficient contingency measures in their RFP so that, upon implementation of such measures, additional emission reductions of at least 3 percent of the adjusted 2002 baseline emissions (or a lesser percentage that will make up the identified shortfall) would be achieved in the year after the failure has been identified. These contingency measures must be fully adopted control measures or rules, so that upon failure to meet milestone requirements, the contingency measures can be implemented without any further rulemaking activities by the States and/or EPA.

To meet the requirements for contingency emission reductions, EPA allows States to use NOx emission reductions to substitute for VOC emission reductions in their contingency plans. The condition set forth by EPA for NOx substitution is that States must achieve a minimum of 0.3 VOC reductions of the total 3 percent contingency reduction, and the remaining 2.7 percent reduction can be achieved through NOx emission controls. Delaware included both VOC and NOx emission controls as contingency measures in this 8-hour ozone RFP.

Based on the CAA and EPA requirements on contingency measures, the contingency VOC reduction for Delaware for the 2008 milestone year is as follows:

The 2002 VOC baseline (statewide) adjusted to 2008 is 111.36 tpd, therefore, contingency VOC emission reduction in 2008 is 111.36 x 3 percent = 3.34 tpd.

Analysis in Chapter 5.5, page 29 of the Delaware SIP, indicates that the three counties in Delaware will have a VOC emission reduction surplus of 1.82 tpd in 2008 [i.e., (33.00 + 61.66) – (32.13 + 60.71) = (94.66 – 92.84) = 1.82]. Therefore there is 3.34 – 1.82 = 1.52 tpd contingency VOC reduction shortfall in 2008.

Delaware's 2002 VOC-to-NOx baseline (with respect to 2008) ratio is (38.82 + 72.54): (55.95 + 137.34) = 111.36:193.29 = 1:1.74. Therefore, the contingency VOC reduction shortfall is equivalent to 1.52 x 1.74 = 2.64 tpd NOx reduction shortfall.

Delaware has implemented numerous controls leading to NOx reductions in 2008 that are greater than the identified 2.64 contingency shortfall. Therefore, there is no need to specify additional contingency measures for the 2008 milestone year.

RACM Analysis and Determination

The CAA and imposes a RACM requirement for areas designated nonattainment for the 8-hour NAAQS. Delaware must demonstrate that it has adopted all RACM controls necessary to move toward attainment as expeditiously as practicable and to meet all RFP requirements. Delaware has demonstrated that the RFP requirements for Delaware have been met. Control measures under RACT, constitute a major group of RACM control measures for stationary sources. To meet the CAA's RACT requirements under the 8-hour ozone standard, Delaware submitted a RACT SIP revision on October 2, 2006, which certifies that all relevant RACT controls have

been implemented in Delaware for attaining the 8-hour ozone standard. EPA approved Delaware's 8-hour RACT SIP revision on July 23, 2008 (73 FR 42681). On May 2, 2007, Delaware submitted a new VOC control from crude oil lightering operations. EPA approved this rule on September 13, 2007 (72 FR 52285).

In addition to those RACT control measures, Delaware adopted a number of other VOC and NOx RACM measures. A summary of the other control measures that Delaware adopted are:

Table 10. Summary of Other Control Measures

Control Measures	Date submitted to EPA	Approval Date
Regulation 1113 – Tightening of Delaware's Open Burning Regulation	5/02/07	9/20/07 (72 FR 53686)
Regulation 1144 – Control of Stationary Generator Emissions	11/01/07	4/29/08 (73 FR 23101)
Regulation 1148 – Control of Stationary Combustion Turbine Emissions	9/11/07	11/10/08 (73 FR 66554)
Regulation 1145 – Restrictions on Excessive Idling of Heavy Duty Vehicles	8/12/05	10/8/09 (73 FR 51792)
Brandywine School Districts Clean School Bus USA grant	ongoing	
Voluntary and mandatory Ozone Action Day initiatives	ongoing	

Transportation Conformity Budgets

The mobile emission budgets for 2008 RFP milestone are based on the projected 2008 mobile source emissions, accounting for all relevant mobile source controls including all Federal controls and Delaware specific controls. The 2008 mobile emissions are projected using EPA's MOBILE6.2 for obtaining emission factors and the "Peninsula Travel Demand Model" for predicting future vehicle miles traveled (VMT). Table 11 is a summary of the 2008 VOC and NOx motor vehicle emissions budgets for the three counties in Delaware.

Table 11. Motor Vehicle Emission Budgets for 2008

County	FIPS	2008 Emissions (tpd)	
		VOC	NOx
Kent	10001	4.14	9.68
New Castle	10003	10.61	21.35
Sussex	10005	7.09	12.86
State Total		**21.84**	**43.89**

On December 19, 2008 (73 FR 77682), EPA published a notice of adequacy for the Delaware 2008 RFP MVEBs. In this notice, EPA found that Delaware's RFP MVEBs are adequate for

transportation conformity purposes. As a result of EPA's finding, Delaware shall use the MVEBs from the June 13, 2007 RFP plan for future conformity determinations for the 8-hour standard.

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