Commonwealth of Pennsylvania

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PROPOSED

Volume I

State Implementation Plan Revision: NO_X Motor Vehicle Emission Budget Revisions Based on the MOVES2010a Model; and General Conformity Budget for Bell Bend Nuclear Power Plant

Scranton/Wilkes-Barre Eight-Hour Ozone Maintenance Area for the 1997 Ozone National Ambient Air Quality Standard

October 2013

Bureau of Air Quality
Pennsylvania Department of Environmental Protection
P.O. Box 8468
Harrisburg, PA 17105-8468
717-787-9495

E. Christopher Abruzzo
Acting Secretary

Tom Corbett
Governor

[This page intentionally left blank.]

Table of Contents

VOLUME I

1. Introduction and Overview of Ground-Level Ozone

Maintaining concentrations of ground-level ozone below the health-based 8-hour ozone national ambient air quality standards (NAAQS) is important because ozone is a serious human health threat and can cause damage to important food crops, forests, and wildlife.

Repeated exposure to ozone pollution may cause a variety of adverse health effects for both healthy people and those with existing conditions including: difficulty breathing, chest pains, coughing, nausea, throat irritation, and congestion. Ozone exposure can exacerbate bronchitis, heart disease, emphysema, and asthma, and reduce lung capacity. Asthma is a significant and growing threat to children and adults. Ozone can aggravate asthma, causing more asthma attacks, increased use of medication, more medical treatment and more frequent visits to hospital emergency clinics. Because ozone pollution usually forms in hot weather, anyone who spends time outdoors in the summer may be affected, particularly children, the elderly, outdoor workers and people exercising. Children are most at risk from exposure to ozone because they are active outside during the summertime when ozone levels are highest.

Ozone is one of the most pervasive and detrimental pollutants known to affect vegetation, causing more injury to trees and crops than any other air pollutant in the United States. Ozone interferes with photosynthesis, the process by which plants convert water and sunlight to food. Ozone makes plants more susceptible to disease, insects, other pollutants and harsh weather. It damages the foliage of trees and other plants, ruining the landscapes of cities, parks, forests, and recreation areas. Research has shown that current ozone concentrations result in reductions in wood growth of over 10 percent in forests of the Northeast United States. There is strong scientific evidence showing that current levels of ozone are reducing crop yields, particularly in sensitive species such as soybean, cotton, and peanuts. Annual crop loss alone from ozone-affected soybeans in Illinois, Indiana and Ohio has been calculated to fall between $199 million and $346 million. The U.S. Environmental Protection Agency (EPA) has estimated national crop yield losses due to ozone in excess of $1 billion annually. One of the key components of ozone, oxides of nitrogen (NO_X), contributes to fish kills and algae blooms in sensitive waterways, such as the Chesapeake Bay.

Ozone is not emitted directly to the atmosphere, but is formed by photochemical reactions between volatile organic compounds (VOCs) and NO_X in the presence of sunlight. The long, hot, humid days of summer are particularly conducive to ozone formation, so ozone levels are of concern primarily during the months of May through September. The primary sources of man-made VOCs and NO_X, the ozone precursors, are the evaporation of fuels and solvents (gasoline and consumer products), combustion of fuels (motor vehicles, power plants and non-road engines), and industrial processes.

1.1. 1997 8-Hour Ozone National Ambient Air Quality Standard

In July 1997, the EPA established identical primary and secondary 8-hour ozone NAAQS at a concentration of 0.08 parts per million (ppm), based on the 3-year average of the annual fourth-highest daily maximum 8-hour average ozone concentrations measured in the ambient air at each

monitored location. Implementation of the standards was delayed due to litigation. The EPA designated the Scranton/Wilkes-Barre Area, which consists of all of Lackawanna, Luzerne, Monroe, and Wyoming Counties, as nonattainment for the 1997 8-hour ozone standard, based on ambient air quality monitoring data collected from 2001-2003. The Scranton/Wilkes-Barre Area was one of seventeen areas in Pennsylvania designated as an 8-hour ozone nonattainment area for the 1997 ozone NAAQS.

On March 12, 2008, the EPA revised the NAAQS for ozone to 0.075 ppm averaged over 8 hours to provide even greater protection for children, other at-risk populations and the environment against the array of ozone-induced adverse health and welfare effects (73 FR 16436; March 27, 2008). On May 21, 2012, the EPA published a final rule for the 2008 8-hour ozone NAAQS, implementing the nonattainment area classification approach, attainment deadlines, and revoking the 1997 ozone NAAQS for the purpose of transportation conformity (77 FR 30160). The EPA proposed an additional implementation rule for the 2008 ozone NAAQS on June 6, 2013, to address state implementation plan (SIP) and related requirements for the 2008 ozone NAAQS (78 FR 34178). The ozone standard is currently undergoing its statutory five year review and EPA is expected to promulgate an ozone standard between 0.060 and 0.070 ppm in the near future. Pennsylvania could have additional areas that do not meet this anticipated revised ozone standard.

The promulgation of the new ozone standard does not affect the need for this revision to the approved maintenance plan for the Scranton/Wilkes-Barre Area (Scranton/Wilkes-Barre Ozone Maintenance Plan) under the 1997 ozone NAAQS.

1.2. Scranton/Wilkes-Barre Area and Ozone SIP Revisions

The Scranton/Wilkes-Barre Area was designated a "basic" nonattainment area on April 15, 2004 (69 FR 23858; April 30, 2004). On June 12, 2007, Pennsylvania requested that the EPA redesignate the Scranton/Wilkes-Barre Area from nonattainment to attainment for the ozone standard. The EPA redesignated the Scranton/Wilkes-Barre Area to attainment on November 19, 2007 (72 FR 64948). The Department concurrently submitted a SIP revision to the EPA that included a maintenance plan based on the attainment and continued long-term attainment of the 1997 ozone NAAQS for the Scranton/Wilkes-Barre Area (Scranton/Wilkes-Barre Ozone Maintenance Plan), the 2002 baseline inventory, and motor vehicle emission budgets (MVEBs) to be used for purposes of transportation conformity. The EPA's transportation conformity regulation, codified at 40 CFR Part 93, Subpart A and incorporated by reference in its entirety at 25 *Pa. Code* Chapter 127, Subpart J, requires that the transportation plan, Transportation Improvement Program (TIP), and projects not from a conforming transportation plan and TIP must be consistent with the MVEBs in the applicable air quality SIP. This criterion is satisfied if the state can demonstrate that emissions of the pollutants or pollutant precursors for which the area is in nonattainment or maintenance, and for which the applicable SIP contains MVEBs approved or deemed adequate by the EPA, are less than or equal to the MVEBs established in the applicable SIP or SIP submission. The metropolitan planning organizations (MPO) and regional planning organizations (RPOs) for the area, Scranton/Wilkes-Barre MPO, Northeastern Pennsylvania Alliance MPO, and Northern Tier RPO, ensure that emissions resulting from their TIPs are less than the MVEBs in the SIP by completing periodic

conformity determinations, which are subject to public comment. MPOs[1] are established in federal regulation. For the purposes of transportation conformity, the Department considers RPOs to perform the same function as MPOs for areas that do not meet the population requirements for establishing an MPO. In the same November 19, 2007, action in which EPA approved Pennsylvania's request to redesignate the Scranton/Wilkes-Barre area as attainment, EPA approved all of the components of the Scranton/Wilkes-Barre Ozone Maintenance Plan, including the MVEBs (72 FR 64948). The EPA approved a revision to the maintenance plan's 2009 and 2018 MVEBs on August 11, 2009. The revision established MVEBs for each MPO and RPO in the nonattainment area (74 FR 40083). This revision does not alter the MVEBs for VOC from the August 11, 2009, revision.

The approved MVEBs included in the Scranton/Wilkes-Barre Ozone Maintenance Plan were estimated using the EPA-approved highway emissions model in effect at that time, the Highway Mobile Source Emission Factor Model version 6.2 (Mobile6.2). The MVEBs in the Scranton/Wilkes-Barre Area Ozone Maintenance Plan included emission budgets for both NO_X and VOC. On March 2, 2010, the EPA released a new mobile source emissions model called the Motor Vehicle Emission Simulator 2010 (MOVES2010). Any new transportation conformity analysis started after March 2, 2013, must use the most up-to-date version of MOVES.

EPA issued the MOVES2010b version of the model and its associated guidance in April 2012. EPA considers both MOVES2010a and MOVES2010b to be minor revisions to MOVES2010 that do not significantly affect the results of modeling criteria pollutant estimates for highway vehicles. References to "MOVES" in the remainder of this document relate to all of the approved versions of the model. The highway vehicle emissions modeling for this proposed SIP revision was already developed significantly using MOVES 2010a. By the time that version 2010b was issued, using MOVES2010b would have been impractical.

Compared to Mobile6.2, the MOVES model estimates higher NO_X emissions and in some areas higher VOC emissions being produced by highway vehicles, depending on the model's inputs. As a result, comparing emissions from the MOVES model to the MVEB included in an approved maintenance plan would not allow local and regional transportation planning agencies to meet the requirements of transportation conformity; the emissions budget in the maintenance plan would be exceeded and transportation planning could be adversely affected. This is why the Department is updating the MVEB for the Scranton/Wilkes-Barre Area using the newer EPA-approved emissions model, MOVES2010a.

It is important to mention that higher emission estimates calculated by MOVES2010a do not mean that emissions from vehicles dramatically increased. The MOVES model better estimates emissions that are already being produced by vehicles. Consequently, the ability of the area to maintain the standard will not be affected by using estimates produced by the new model.

[1] 23 CFR §450.300-450.336

1.3. EPA Requirements for Developing and Revising Maintenance Plans

The EPA-approved 2007 Scranton/Wilkes-Barre redesignation request is consistent with the September 4, 1992, EPA memorandum written by John Calcagni, Director, Air Quality Management Division, entitled, *Procedures for Processing Requests to Redesignate Areas to Attainment*. For the Scranton/Wilkes-Barre Ozone Maintenance Plan, the Department produced an emissions inventory for NO_X, VOC, and carbon monoxide (CO) for 2004, the attainment year, which included ambient air quality monitoring data that showed emissions that met the 1997 ozone NAAQS in the Scranton/Wilkes-Barre Area. The inventory was based on a "typical summer day," as required by the EPA. The Department developed an emissions inventory for 2018 that demonstrated that the area would meet the 1997 ozone NAAQS for a 10-year period following redesignation of the area to attainment. The emissions inventory for 2018, a maintenance year, showed that emissions of NO_X, VOC, and CO in the Scranton/Wilkes-Barre Area would not exceed emissions that occurred in 2004. The maintenance year is a year at least 10 years in the future that a state chooses to demonstrate that emissions over a 10-year period of analysis will not lead to an exceedance of the standard. A state demonstrates attainment of the standard by showing that emissions in a maintenance year are less than emissions in the attainment year.

An emissions inventory in the Scranton/Wilkes-Barre Ozone Maintenance Plan showed that emissions in 2009, the interim year, did not exceed emissions in 2004, the attainment year. The 2009 and 2018 inventories both considered future growth projected from a 2002 baseline year, and included emission reductions from permanent and enforceable control measures.

This proposed SIP revision updates highway emissions estimates in the Scranton/Wilkes-Barre Ozone Maintenance Plan using the newer MOVES2010a model. The Department need not update emissions estimates for area sources (except to reflect new emissions related to Marcellus Shale activity in the 2018 inventory) or nonroad sources because actual growth in emissions from these two sectors was less than projected in the Scranton/Wilkes-Barre Ozone Maintenance Plan. The growth assumptions for emissions produced by area sources in the maintenance plan are mostly greater than the actual growth that occurred from 2002 to 2009 (See Table 7). The growth assumptions for emissions produced by nonroad sources in the maintenance plan are greater than what actually occurred from 2002 to 2009. Projected growth of nonroad source emissions in the approved Scranton/Wilkes-Barre Ozone Maintenance Plan for the year 2009 was greater than the actual growth that actually occurred from 2002 to 2009. Additionally, newer, updated emission growth projections to 2018 for area and nonroad sources are less than emission growth projections for these sources in the Scranton/Wilkes-Barre Ozone Maintenance Plan. Company-reported point source emissions are used in this proposed SIP revision to revise the projected 2009 emissions in the Scranton/Wilkes-Barre Ozone Maintenance Plan. Also in this proposed SIP revision, linearly interpolated 2018 point source emission estimates derived from the Mid-Atlantic Regional Air Management Association (MARAMA) 2011 effort for modeling ambient particulate matter concentrations are used to revise 2018 projected point source emissions in the Scranton/Wilkes-Barre Ozone Maintenance Plan.

This proposed SIP revision also provides a general conformity budget for Bell Bend Nuclear Power Plant.

Recent ambient air quality monitoring results for the Scranton/Wilkes-Barre Area demonstrate continued attainment of the 1997 ozone NAAQS (0.08 parts per million, with rounding 84 parts per billion), as shown in Table 1.

Table 1: Scranton/Wilkes-Barre Area 2012 Design Values

Monitor	2010 4th highest	2011 4th highest	2012 4th highest	3-Year Average or Design Value[1]
Lackawanna 42-069-0101	74 ppb	71 ppb	72 ppb	72 ppb
Lackawanna Downwind 42-069-2006	71 ppb	68 ppb	74 ppb	71 ppb
Luzerne 42-079-1100	70 ppb	64 ppb	66 ppb	66 ppb
Luzerne 42-079-1101	66 ppb	65 ppb	68 ppb	66 ppb
Monroe 42-089-0002	78 ppb	63 ppb	69 ppb	70 ppb

[1] A "design value" is the annual fourth highest daily maximum 8-hour ozone concentration, averaged over three years.

The EPA Office of Transportation and Air Quality developed guidance titled, *Policy Guidance on the Use of MOVES2010 and Subsequent Minor Revisions for State Implementation Plan Development, Transportation Conformity, and Other Purposes*, (MOVES2010 guidance) EPA 420-B-12-010, April 2012. This guidance describes requirements for SIP revisions. For maintenance demonstrations, areas can have a revised motor vehicle emissions inventory and budget using MOVES without revising emissions for other sectors included in the applicable SIP or completing additional modeling if:

- The SIP continues to meet applicable requirements when the previous motor vehicle emissions inventories are replaced with inventories generated by MOVES2010a; and,

- The state can document that growth and control strategy assumptions for non-motor vehicle sources continue to be valid and minor updates do not change the overall conclusions of the SIP.

The EPA further states that if both of the criteria are met, the state can simply re-submit the original maintenance plan with the revised motor vehicle emissions inventories, using the most

current version of the MOVES model. However, if either criterion is not met, the emissions categories in the maintenance plan that have changed must be brought up to date. In this SIP revision, emissions growth of point, area, nonroad and highway sources are compared directly, but emissions growth due to a new emissions source, Marcellus Shale drilling activity, is displayed separately and included in the area source inventory. Drilling activity includes well drilling and transport of the gas with the use of compressor stations. Highway vehicle emissions relating to gas drilling activity is included in the mobile inventory.

For this SIP revision, actual 2009 and projected 2018 point source emissions are less than the emissions included in the Scranton/Wilkes-Barre Ozone Maintenance Plan. Nevertheless, this SIP revision revises point source emissions for both 2009 and 2018. Actual area source activity did not increase compared to projected growth of area source activity in the Scranton/Wilkes-Barre Ozone Maintenance Plan. The area source emissions in the Scranton/Wilkes-Barre Ozone Maintenance Plan will not be revised except for adding Marcellus Shale emissions. Even though area source NO_X and VOC emissions increased very slightly from 2004 to 2018 in the Scranton/Wilkes-Barre Area and increase even more when emissions from Marcellus Shale activity are added, emissions from all sectors in 2018 fall below 2004 emissions for both NO_X and VOC.

This proposed SIP revision includes information addressing the recommendations described in the MOVES2010 guidance, listed here:

- Demonstration that the 1997 ozone NAAQS approved maintenance plans continues to meet applicable requirements with the revised motor vehicle emissions inventories, as calculated by the most recently approved MOVES model, and recalculation of the attainment year, interim year and maintenance year MVEBs with the latest planning assumptions, including documentation of the updated assumptions;

- Review of the point, area, and nonroad emissions inventories for the interim year and maintenance year to determine if growth and control strategy assumptions have changed and, if so, development of an analysis to determine if these changes affect the conclusion of the maintenance plan that air quality will remain compliant with the 1997 ozone NAAQS; and

- Assessment to confirm that excess emissions exist and the quantification of these excess emissions for use in the safety margin applied to the MVEBs.

1.4. Maintenance Plan Demonstration and Motor Vehicle Emissions Budgets

Tables 2a, 2b, and 2c show the revised 2004, 2009 and 2018 NO_X and VOC MVEBs calculated using the latest planning assumptions for the Scranton/Wilkes-Barre Area using MOVES2010a. Assumptions used in the MOVES2010a modeling, including model inputs, growth assumptions and modeling methodology, are provided in Appendix C. Highway vehicle emissions generated by MOVES2010a show a clear, downward trend in emissions in future years. Emissions of NO_X were generated by MOVES and emissions of VOC were generated by Mobile6.2.

Table 2a: Motor Vehicle Emissions Budgets Calculated with MOVES2010a for the Scranton/Wilkes-Barre MPO

Year	NO_X Emissions (tons/day)	VOC Emissions (tons/day)
2004 Attainment Year	54.88	22.77
2009 Modeled Emissions	41.27	16.63
Conformity Portion of Safety Margins[2]	1.40	1.36
2009 Interim Year Budget	42.67	17.99
2018 Modeled Emissions	20.53	9.84
Conformity Portion of Safety Margins	1.37	1.96
2018 Maintenance Year Budgets	21.90	11.80

[2] A "safety margin" is the amount of emissions by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for reasonable further progress, attainment, or maintenance (40 CFR §93.101). The state may designate a portion of these emissions for use by the MPO or Department of Transportation (DOT) as a safety margin to be used for transportation projects. See 40 CFR §93.124(a) for application of a safety margin.

Table 2b: Motor Vehicle Emissions Budgets Calculated with MOVES2010a for the Northeastern Pennsylvania Alliance MPO

Year	NO_X Emissions (tons/day)	VOC Emissions (tons/day)
2004 Attainment Year	18.85	7.42
2009 Modeled Emissions	13.61	5.73
Conformity Portion of Safety Margins	0.49	0.46
2009 Interim Year Budget	14.10	6.19
2018 Modeled Emissions	6.55	3.99
Conformity Portion of Safety Margins	0.55	0.65
2018 Maintenance Year Budgets	7.10	4.64

Table 2c: Motor Vehicle Emissions Budgets Calculated with MOVES2010a for the Northern Tier RPO

Year	NO_X Emissions (tons/day)	VOC Emissions (tons/day)
2004 Attainment Year	3.29	1.40
2009 Modeled Emissions	2.39	0.97
Conformity Portion of Safety Margins	0.11	0.03
2009 Interim Year Budget	2.50	0.99
2018 Modeled Emissions	1.46	0.51
Conformity Portion of Safety Margins	0.14	0.03
2018 Maintenance Year Budgets	1.60	0.54

1.5. Non-Mobile Inventory Review

The EPA states in its MOVES2010 guidance that revisions to existing SIPs and motor vehicle emission budgets must continue to meet applicable Clean Air Act requirements. A maintenance plan revised to take into account new emission estimates due to an update in the highway model must demonstrate that attainment of the standard continues, even with updated control measures and growth estimates. This proposed SIP revision includes increases in the maintenance plan's NO_X emission estimates for the attainment, interim and maintenance years resulting from revising highway emissions using MOVES instead of the Mobile6.2 model. This proposed SIP revision also accounts for emissions of point, area, and nonroad sources using the latest planning assumptions and growth estimates. Total emissions of VOC and NO_X in the years 2009 and 2018 cannot exceed the emissions in the 2004 attainment year inventory. The Department concludes that the Scranton/Wilkes-Barre Area will continue to demonstrate attainment of the 1997 ozone NAAQS because total emissions of NO_X in the interim year and maintenance year will be less than the 2004 attainment year emissions for NO_X. Developing a revised highway inventory for CO and VOC is unnecessary for this proposed SIP revision because CO and VOC emissions in most cases decrease across the maintenance area using MOVES in place of the Mobile6.2 model.

Growth and control strategy assumptions have changed for all of the emission categories since the Scranton/Wilkes-Barre Ozone Maintenance Plan was approved. The changes in these assumptions have generally decreased forecasted emissions in future years. A severe economic recession occurred since the maintenance plan was approved and employment was greatly depressed, falling short of the employment projections in the maintenance plan for the year 2009. More controls of source categories have been implemented at both the federal and state level. Nonroad NO_X projected emissions are not being revised for the interim and maintenance year in this proposed SIP revision. Area source emissions are being kept the same for 2009 and updated for 2018 in this proposed SIP revision. The point source emission inventory is being updated. The Department compared updated growth estimates with growth assumptions and growth estimates in the Scranton/Wilkes-Barre Ozone Maintenance Plan. That analysis is included below. More detailed information can be found in Volume II: Technical Support Document.

Some SIP revisions for certain areas in the Commonwealth will require the Department to update growth and strategy assumptions of non-motor vehicle sources. A number of areas in the Commonwealth are home to newly-built stationary air contamination sources. Some areas have experienced Marcellus Shale gas development, which has increased area source emissions.

The EPA developed the Clean Air Interstate Rule (CAIR) in 2005 to control emissions from EGUs (70 FR 25162; May 12, 2005) and later amendments. The U.S. Court of Appeals for the D.C. Circuit remanded CAIR in December 2008, without vacating it, in *North Carolina v. EPA*, 531 F.3d 896, *modified*, 550 F.9d 1176 (D.C. Cir. 2008). EPA developed the Cross-State Air Pollution Rule (CSAPR) in 2011 to limit the transport of NO_X and sulfur dioxide, which could have changed projected emissions of point sources (76 FR 48208; Aug. 8, 2011), and later revisions. The court vacated CSAPR on August 21, 2012, however, and ordered EPA to continue administering CAIR pending the promulgation of a valid replacement (See, *EME Homer City Generation L.P. v. EP*A, 696 F3.d 7 (D.C. Cir. 2012), *rehearing denied*, 2013 U.S.

App. LEXIS 1623 and 1624 (D.C. Cir. Jan. 24, 2013)). The Supreme Court of the United States announced on June 24, 2013, that they will review the Circuit Court decision. Following the Circuit Court's direction, CAIR remains in place. On November 19, 2012, Assistant Administrator Gina McCarthy issued a memorandum stating that it is appropriate for EPA to rely on CAIR reductions as permanent and enforceable until court proceedings are resolved or, if the vacatur of CSAPR remains in place, until EPA promulgates a replacement rule and state plans for implementation of the replacement rule are approved. Some owners and operators of EGUs have responded to new economic and regulatory developments by closing or deactivating coal-fired electric generation units or by switching fuels (such as natural gas) at their facilities, which includes facilities in the Scranton/Wilkes-Barre Area.

Tables 3 and 4 show that emissions in the future, interim and maintenance years will not exceed overall emissions from all sources in 2004, the attainment year, even though highway emissions are greater in the Scranton/Wilkes-Barre Area when modeled by MOVES than when the emissions were estimated by Mobile6.2 in the maintenance plan. Actual emissions for the 2009 point sources and updated 2018 projected point source emissions were included in the SIP revision inventory. Projected nonroad category emissions from the Scranton/Wilkes-Barre Ozone Maintenance Plan are used for 2009 and 2018 in this proposed SIP revision. Projected nonroad sources do not need to be updated because emissions and activity growth from nonroad sources have not increased since the Scranton/Wilkes-Barre Ozone Maintenance Plan was submitted to EPA. Area source emissions in the Scranton/Wilkes-Barre Ozone Maintenance Plan are left unchanged since projected growth of these sources is either unchanged or less since actual growth is less than what was predicted. However, emissions from Marcellus Shale development activity were added to the 2018 area source emissions as a result of that activity which has occurred and will occur after 2009. Attainment of the 1997 ozone standard is maintained by showing that revised actual and projected growth for 2009 and 2018 does not increase overall future emissions of the Scranton/Wilkes-Barre Ozone Maintenance Plan. This proposed SIP revision demonstrates that growth assumptions in the Scranton/Wilkes-Barre Ozone Maintenance Plan forecast greater growth than what actually occurred or will occur in the major source category segments.

Table 3: Revised Scranton/Wilkes-Barre Area
Summer Day NO_X Emissions from 2004 to 2018

NO_X in tons/day						
Year	**Point**	**Area***	**Nonroad**	**Mobile**	**General Conformity Budget for Bell Bend**	**Total**
2004	7.0	4.0	10.9	77.0	0.0	98.9
2009	7.7	4.2	8.9	59.3	1.0	81.1
Δ(2004-2009)	0.7	0.2	-2.0	-17.7	1.0	-17.8
2018	5.8	8.2	5.6	30.6	1.0	51.2
Δ(2004-2018)	-1.2	4.2	-5.3	-46.4	1.0	-47.7

*Area sources include emissions of Marcellus Shale Activity.

2. Source Category Emissions

2.1. Point Source Category Emissions

2.1.1. Control Measures

At the time of the development of the Scranton/Wilkes-Barre Ozone Maintenance Plan, many large sources were affected by the requirements of CAIR. Pennsylvania implemented NO_X control programs, including implementation of CAIR, which control NO_X from large industrial boilers, internal combustion engines, electric generating units, and cement kilns. Another control measure took effect for NO_X emissions for point sources after the Scranton/Wilkes-Barre Ozone Maintenance Plan was approved. New Source Performance Standards (NSPS) affected new engines installed at facilities after January 1, 2011, by requiring internal combustion engines to meet a 50 percent reduction in NO_X, and will reduce NO_X emissions of the affected sources in 2018. The reductions that will result are not included in the inventory. These reductions are mentioned to demonstrate that emissions will continue to decrease in the area.

2.1.2. Growth Estimates in the Scranton/Wilkes-Barre Ozone Maintenance Plan

Two annual point source inventories using historical emissions data reported to the Department by point source facilities were included in the Scranton/Wilkes-Barre Ozone Maintenance Plan. The Department developed an emissions inventory of point sources for calendar years 2002 and 2004. The 2002 point source emissions inventory represents a time when the Scranton/Wilkes-Barre Area did not meet the 1997 ozone NAAQs. The 2004 point source inventory showed emissions that occurred during 2004, the attainment year for the 1997 ozone NAAQS. Emission projections for the point source sector for 11 states, including Pennsylvania, and the District of Columbia, were prepared for MARAMA by MACTEC Federal Programs, Inc. (MACTEC). Future year projections were developed by MACTEC so that states could use the point source inventories in their SIPs. Emission projections were prepared for years 2009 and 2018.

For the purpose of projecting emissions into the future, the point source inventory in the Scranton/Wilkes-Barre Ozone Maintenance Plan is divided into two subsectors – the EGU sector and the non-EGU sector. Different projection methods were used for those two sectors. For the EGU sector, the Mid-Atlantic/Northeast Visibility Union (MANE-VU) used the Integrating Planning Model (IPM) to project future electric generation, as well as to calculate the impact of control programs on future emission levels. The EGU Modeling data was made available by MANE-VU to its member states, including Pennsylvania. The Scranton/Wilkes-Barre Area has several CAIR affected facilities. For the non-EGU sector, growth factors were developed by using the EPA's Economic Growth Analysis System Version 5.0 (EGAS 5.0). The U.S. Department of Energy fuel consumption forecasts were used to replace default values in EGAS 5.0. Also, state-supplied population, employment, and other emission projection data were used to update and enhance the EGAS 5.0 default values.

In the Scranton/Wilkes-Barre Area, two electric generating units at the UGI Development Corporation facility in Hunlock Creek were activated since EPA approved the Scranton/Wilkes-Barre Ozone Maintenance Plan. These two units are powered by natural gas. The two units replaced one coal-powered unit, which resulted in significant reductions of NOx emissions. The resulting emissions reductions are projected in the 2018 point source emission inventory of this SIP revision.

2.1.3. Point Source Category Conclusion

This proposed SIP revision projected NO_X emissions for 2009 in the Scranton/Wilkes-Barre Ozone Maintenance Plan are being revised with actual emissions for point sources in 2009, because the actual emissions are readily available and allow easy comparison between the projected emissions in the maintenance plan and the actual emissions. The Department assessed point source emissions by comparing the actual emissions inventory data submitted to the Department by owners and operators of point sources for 2009 to the estimated 2009 NO_X emissions from point sources in the Scranton/Wilkes-Barre Ozone Maintenance Plan. The Scranton/Wilkes-Barre Ozone Maintenance Plan overestimated point source emissions for 2009. Table 5 shows that the projected point source emissions of NO_X in the Scranton/Wilkes-Barre Ozone Maintenance Plan were 1.7 tons per day more than actual 2009 point source emissions. Actual emissions of NO_X and VOC declined from 2004 to 2009, even when compared to the slow growth in emissions forecasted in the Scranton/Wilkes-Barre Ozone Maintenance Plan. The emission estimates were as close as they were item in the Scranton/Wilkes-Barre Ozone Maintenance Plan because emission reduction credits were not included as a line.

Table 4: 2009 Point Source Emissions - Maintenance Plan Estimates versus Actual

2009 Emissions	NO_X (tons/day)
Maintenance Plan Estimate	9.4
Actual	7.7

In this proposed SIP revision, the Department revises the 2018 inventory in the Scranton/Wilkes-Barre Ozone Maintenance Plan by using emissions from the inventory developed by MARAMA. The MARAMA projected inventory estimated emissions for the years 2017 and 2020 from a baseline 2007 emissions inventory. In order to obtain emission estimates for the 2018 maintenance year, a straight line interpolation between 2007 and 2020 was used and outstanding emission reduction credits were used. Projected point source NO_X emissions in 2018 using the MARAMA estimates are still well below the 2018 projected point source emissions in the Scranton/Wilkes-Barre Ozone Maintenance Plan, as shown in Table 6, and thus show that projected point source emissions in 2018 will fall below the 2004 (attainment year) emission levels. For more information about how the projected emissions were estimated, see Volume II: Technical Support Document.

Table 5: 2018 Point Source Emissions – Maintenance Plan Estimate Versus Revised 2018 Emissions

2018 Emissions	NO_X (tons/day)
2018 Maintenance Plan Estimate	10.5
2018 Revised Estimate (MARAMA Inventory)	5.8

2.2. AREA SOURCE CATEGORY EMISSIONS

2.2.1. Control Measures

The area sector includes, but is not limited to, such diverse emissions source categories as: surface coating; commercial and consumer solvent use; residential heating; open burning; traffic line painting; and landfill gases. Emissions are produced from a wide number of sources for which actual emissions or direct indicators of emissions are not available.

2.2.2. Growth Estimates in the Maintenance Plan

Area source emission growth factors were developed by using the default configuration in EGAS 5.0. EGAS 5.0 used the Department of Energy Annual Energy Outlook 2004 (AEO2004) fuel use projections. In this proposed SIP revision, the AEO2005 fuel consumption forecasts were used to replace AEO2004 forecasts. State-supplied population and employment data were used to replace default data, when the state-specific data was available. Growth estimates were represented by growth factors for each area source classification code (SCC) for each county.

County-level population data for 2000, and projections for 2010 and 2020 from the Pennsylvania State Data Center, http://pasdc.hbg.psu.edu/, were provided to derive growth factors for this proposed SIP revision. This data were interpolated to obtain growth factors for projecting emissions from 2002 to 2009 for SCCs that are population based. General employment data for 21 counties or areas for 2000, and projections to 2010 and 2020, were used. This data were also interpolated to estimate growth factors for projecting from 2002 to 2009 and 2018 for nine area source categories. For all other area source categories, AEO2005 forecasts were used for projecting emissions from area source fuel combustion, when available. If AEO2005 forecasts are not available, EGAS 5.0 default factors were used.

The Scranton/Wilkes-Barre Ozone Maintenance Plan relied upon many different types of socioeconomic indicators that served as surrogates to actual sales data to estimate emissions growth and emissions from the area source sector when actual sales data was not available. Population, employment, fuel use and housing data are some of the surrogates used. Methodologies for estimating emissions from some area sources were updated by the EPA in the time since EPA approved the Scranton/Wilkes-Barre Ozone Maintenance Plan, but because the emissions change similarly for the attainment, interim and maintenance years, as a result of these updated methodologies, the emissions changing will not result in a significant difference between the attainment year's emissions and the maintenance year's emissions. As Table 7 shows, with the exception of commercial boilers using natural gas, growth in area source activity has declined. Overall, emissions decrease from area sources, since actual growth rates from 2002 to 2009 and projected growth rates from 2009 to 2018 are lower than, or nearly the same as, the growth rates used in the Scranton/Wilkes-Barre Ozone Maintenance Plan. The growth surrogates presented in Table 7 serve as growth surrogates for most SCCs in the area source category in the maintenance plan, which account for a large majority of the emissions in the area source inventory. Table 8 shows that revised growth is less in most categories than what appeared in the maintenance plan with the exception of residential distillate oil and anthracite commercial coal use, which are up slightly from the original estimates in the maintenance plan.

Table 6: Comparison of Growth Factors Used in Maintenance Plan and Inventory Updates from 2002 to 2009

Growth Surrogates	Maintenance Plan Surrogate Estimates (2006)	Actual Growth (Census Data)
Population *	1.0400	1.0215
Total Employment	1.0586	1.0359
Commercial Boilers Natural Gas	1.0106	1.1167
Commercial Boilers, Distillate	1.0731	1.0221
Commercial Boilers, Coal	1.0481	0.6805

*Growth for the year 2009 is computed from the years 2002 to 2009.

Table 7: Comparison of Growth Factors Used in Maintenance Plan and Inventory Updates from 2009 to 2018

Growth Surrogates	Maintenance Plan Growth (2009-2018)*	Revised Growth from MARAMA Inventory (2009-2018)*
Population	1.1081	1.0509
Employees	1.1499	1.0113
Anthracite Coal, Industrial	0.9988	0.9799
Anthracite, Commercial	0.9865	1.0055
All Combustor Types, Distillate Oil, Residential	0.9598	0.9615
Boilers and Internal Combustion Engines, Natural Gas, Commercial	1.0521	1.0154
Combustor Types, Natural Gas, Residential	1.0181	1.0034

*Growth for the year 2018 is given as a factor estimating growth from 2009 to 2018. Due to different time ranges used for growth estimates in the maintenance plan and more recent inventory data, growth based on 2002 was impossible to estimate. This method allows for a direct comparison.

2.2.3. Growth Estimates in MARAMA 2011 Regional Modeling Effort

The development of growth factors for the MARAMA 2011 regional modeling effort for area sources used one or a combination of the following as surrogates for growth: AEO2010, population data, or employment data. A direct comparison cannot be made between the growth factors based on AEO2005 or population in the original maintenance plan and this proposed SIP revision, which uses growth factors from MARAMA's 2011 regional modeling effort. As years pass, different inventory methodologies are developed. This proposed SIP revision uses the best possible method to compare emissions inventories that use differing methodologies (See Volume II: Technical Support Document). The MARAMA 2011 regional modeling effort developed growth factors for most SCCs using AEO2010 or county level population. Employment data was derived from North American Industry Classification System to the state level. Since employment data to the county level was not available from the MARAMA 2011 modeling, state employment data was applied to all SCCs and counties in this proposed SIP revision. The recession also reduced employment, which fell short of the projections in the maintenance plan for the year 2009. Starting from depressed employment levels in 2009, it is unlikely that employment projections in the maintenance plan will be exceeded in reality in 2018, even if employment growth recovers to normal levels in the near future. Revised growth estimates show this to be the likely case.

2.2.4. Marcellus Shale Emissions

Significant infrastructure development to extract Marcellus Shale natural gas in certain counties in Pennsylvania has occurred since the Department submitted the Scranton/Wilkes-Barre Area Maintenance Plan to EPA for approval. Area source emissions result from the placement of drilling equipment, gathering lines and compressor stations. The Scranton/Wilkes-Barre Area has experienced natural gas development of the Marcellus Shale play in the region. Projections of drilling activity in Pennsylvania developed by the Marcellus Shale Coalition indicate that drilling activity will remain constant from 2009 until 2018. Although Marcellus Shale drilling activity will remain constant in Pennsylvania for the foreseeable future, activity of compressor stations will increase because the volume of natural gas being pumped will increase from present to the maintenance year 2018. Compressor engines will be cleaner in the future, due to the Department's February 2013 issuance of *General Permit BAQ-GPA/GP-5, Natural Gas Compression and/or Processing Facilities* (GP5). Currently, GP5 limits NO_X emissions of compressor station lean-burn engines over 500 brake horsepower at 0.50 grams per brake horsepower-hour, respectively, and even less for rich burn engines. Table 9 shows NO_X emissions from Marcellus Shale activities. While some drilling activity occurred in Lackawanna County, the annual emissions rounded to zero when the Department estimated daily emissions.

The Department issued one General Permit for one compressor station which was never built. Therefore, as of 2009, no compressor stations were built. By 2012, seven plan approvals or authorizations to use GP-5 were issued to companies to build compressor stations that use a total of 27 engines over 500 brake horsepower in the Scranton/Wilkes-Barre Area. Given that natural gas production will likely steadily grow over the next decade, it is expected that additional compressor stations will be needed in the Scranton/Wilkes-Barre Area. See Volume II:

Technical Support Document for more details on the methodology used for estimating Marcellus Shale drilling activity and compressor engine emissions.

Table 8: NO_X Emissions Related to Marcellus Shale Activity (tons/day)

County	Type of Emission Activity	Years		
		2004	2009	2018
		NO_X	NO_X	NO_X
Lackawanna	Drilling	0.0	0.0	0.0
Lackawanna	Compressor Stations	0.0	0.0	0.0
Wyoming	Drilling	0.0	0.0	1.7
Wyoming	Compressor Stations	0.0	0.0	2.1

2.2.5. Area Source Category Conclusion

The Department examined growth indicators that predict most area source emissions growth (population, total employment, and fossil fuel use) that actually occurred between 2002 and 2009. Fossil fuel use is predictive of growth in NO_X emissions. Population and total employment growth was either the same or slightly lower in 2009 than 2002. Of the major fossil fuels examined, only natural gas use increased at a faster rate than what was predicted in the Scranton/Wilkes-Barre Ozone Maintenance Plan. Natural gas use from 2002 to 2009 was about 10 percent higher than what was predicted in the Scranton/Wilkes-Barre Ozone Maintenance Plan. By energy content, in 2009, natural gas used in the Scranton/Wilkes-Barre Area was slightly less than the combined energy content of coal and distillate oil used. Actual coal consumption was 36 percent lower and distillate oil consumption was 4 percent lower than what was predicted. Even though coal use comprises only half of the energy content of the natural gas used in the Scranton/Wilkes-Barre Area, a 36 percent over prediction in coal use offsets the 10 percent under prediction of natural gas use in terms of total energy used. Therefore, less energy in the area source sector was used in 2009 than what was predicted in the Scranton/Wilkes-Barre Ozone Maintenance Plan. Since coal and distillate oil usually produce more emissions than natural gas per unit of energy content, it can be assumed that emissions from area source fossil fuels declined from 2002 to 2009.

Emissions produced by Marcellus Shale activity were a significant addition to the area source inventory in the Scranton/Wilkes-Barre Ozone Maintenance Plan. Area source emissions were revised by adding Marcellus Shale emissions to the emissions included in the maintenance plan.

For area source emissions other than Marcellus Shale related emissions, the Department demonstrated that it is reasonable to assume that emissions growth for area sources that has and is occurring is less than the growth forecasted in the Scranton/Wilkes-Barre Ozone Maintenance Plan for NO_X for the interim and maintenance years, 2009 and 2018. The Department compared growth estimates used in the Scranton/Wilkes-Barre Ozone Maintenance Plan and the MARAMA 2011 regional modeling effort. Emissions of NO_X from the area source sector have increased only as a result of Marcellus Shale activity. Therefore, the area source inventory was revised by adding emissions from Marcellus Shale activity for the year 2018.

2.3. Nonroad Source Category Emissions

2.3.1. Control Measures

The nonroad category contains many different types of equipment. The Department used NONROAD2005 for the Scranton/Wilkes-Barre Ozone Maintenance Plan. All versions of the EPA's NONROAD Model estimate emissions for over 200 types of engines and vehicles. Nonroad engines and vehicles can be used for such applications as construction, lawn and garden care, farming, and industrial applications. Emissions from three types of activities -- aircraft, locomotive, and commercial marine vessel activities -- are not estimated in the NONROAD Model but are in the nonroad category. In the Scranton/Wilkes-Barre Ozone Maintenance Plan, the NONROAD2005 model was used to estimate emissions of nonroad vehicles and engines. The model went through one major revision since then. NONROAD2008a is the latest version of this model. This new version of the model incorporates two reduction strategies that affect engines and vehicles in the nonroad sector:

- Diesel recreational marine standards in the 2008 final rule on locomotive and marine engines (See *Control of Emissions of Air Pollution From Locomotive Engines and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder*; 73 FR 25098; May 6, 2008); and

- The October 2008 small spark ignition and spark ignition and recreational marine rule (See *Control of Emissions from Nonroad Spark-Ignition Engines and Equipment;* 73 FR 59034; October 8, 2008).

For the Scranton/Wilkes-Barre Ozone Maintenance Plan, the Department modified files in the NONROAD Model, when state specific data was available, that affect emission categories such as residential lawn and garden and recreational marine vessels.

2.3.2. Growth Estimates

Emissions from nonroad sources have decreased since the submittal of the Scranton/Wilkes-Barre Ozone Maintenance Plan as a result of additional controls mentioned in Section 2.3.1, and other controls that have been phased in since 2004 for engines used in the nonroad sector. The fleet turnover that occurs as older, more polluting nonroad equipment and vehicles are replaced by newer equipment and vehicles that meet more stringent emission standards has continued to

lower emissions in the nonroad sector since the late 1990s, and will continue to do so for the next 10 years. Because of these controls, emission reductions occurred across all segments of the nonroad category, including construction equipment, farming equipment, locomotives, and lawn and garden equipment. Furthermore, the recession significantly lowered construction, railroad, aircraft, and industrial activity, and, consequently, lowered emissions. Even if growth returns to pre-recession levels, overall growth will likely remain lower than predicted in the maintenance plan up to the 2018 maintenance year.

2.3.3. Nonroad Source Category Conclusion

The Department demonstrated that it is reasonable to assume that emissions growth for nonroad sources that has occurred, and is occurring, is less than the growth forecasted in the Scranton/Wilkes-Barre Ozone Maintenance Plan for NO_X for both maintenance years: 2009 and 2018. The Department compared growth estimates used in NONROAD2005 and NONROAD2008a, and took into account fleet turnover and the effects of the recession. Emissions of NO_X from the nonroad source sector have not increased as a result of any new activity or update in methodology. Therefore, no revisions to the nonroad source sector for NO_X emissions are necessary.

2.4. General Conformity Budget for Bell Bend Nuclear Power Plant

2.4.1. Bell Bend Nuclear Power Plant Emissions

PPL Nuclear Development, LLC is proposing to build a nuclear power plant in Luzerne County called Bell Bend. Building the Bell Bend Nuclear Power Plant will involve a great amount of earth moving activity, and with that activity, will produce significant NO_X emissions. The project will invoke the general conformity requirements of 40 CFR part 93, Subpart B, which implement section 176 of the Clean Air Act, 42 U.S.C. § 7506, and which are adopted by reference by the Commonwealth in 25 *Pa. Code* Chapter 127, Subchapter J. The project schedule indicates it will take seven years to complete the plant.

The general conformity requirements are designed to ensure that Federal actions comply with national ambient air quality standards. In order to meet this Clean Air Act requirement, a Federal agency must demonstrate that every action that it undertakes, approves, permits or supports will conform to the appropriate SIP (http://www.epa.gov/air/genconform/faq.html#6). Federal agencies taking actions, in this case the Nuclear Regulatory Agency, will need to demonstrate that the actions taken by PPL Nuclear Development, LLC meet the requirements of the General Conformity Rule.

The nonroad equipment used for this project will produce an amount of NO_X emissions that will exceed the applicable *de minimis* NO_X threshold in 40 CFR § 93.153(b), which is 100 tons per calendar year for the Scranton/Wilkes-Barre Area. The project will also increase NO_X emissions from highway and area sources. Annual emissions of NO_X for this project are forecasted to be largest during the second year of construction, at 167.7 tons. This amount of emission is produced by on-site nonroad diesel equipment and vehicles, small combustion engines, work

force commuting that occurs within the maintenance area, delivery vehicle that operate within the maintenance area, on-site highway vehicles, and safety-related activities.

Annual VOC emissions for this project will not exceed 14.3 tons, which is far below the *de minimis* VOC threshold in 40 CFR § 93.153(b) of 50 tons per calendar year. Emissions of VOC do not need to be considered in this budget.

A NO_X budget for the purposes of meeting the requirements of General Conformity is included in this SIP revision. The NO_X budget for this project is established at 1.0 tons of NO_X per summer day for the maintenance years 2009 and 2018. The summer day budget satisfies the requirements in 40 CFR § 93.158(a)(5)(i)(A), criteria for determining conformity of general federal actions. The budget for 2009 will apply to emissions produced by the project that occur during calendar years prior to 2018. The budget for 2018 will cover emissions that are produced by the project in calendar years 2018 and beyond. Section 175A(b) of the Clean Air Act requires the Department to submit a second 10-year maintenance plan 8 years after redesignation of the area as attainment, which would be 2015. This maintenance plan would show maintenance of the ozone standard for the Scranton/Wilkes-Barre area until 2028 and would include interim emission inventories for years up to and including 2028.

The summer day emissions budget corresponds to an annual emissions cap that does not exceed 201.0 tons of NO_X per calendar year. The 201.0 tons of NO_X represents 120 percent of the value of the project's peak emissions for a calendar year. The 20 percent emissions that are added to the budget that go beyond the estimated emissions for the project should allow the project to proceed in the event of changes in scheduling or small changes in the scope of the project. If the annual emissions cap is exceeded, the Nuclear Regulatory Commission or other agency taking action with respect to this project could be responsible for developing emission mitigation projects or obtaining emission offsets. Finally, any emission reduction obtained from mitigation measures or emissions offsets need to be made in accordance to the offset ratios and scheduling requirements per 40 CFR § 93.163.

See Volume II: Technical Support Document for more details of the emission estimation methodology for Bell Bend Nuclear Power Plant project.

2.4.2. General Conformity Budget for the Bell Bend Nuclear Power Plant Project

Table 9: General Conformity Budget for Bell Bend Nuclear Power Plant

Calendar Year	Pollutant
	NO_X
2009	1.0 tons/summer day (201 tons/year)
2018	1.0 tons/summer day (201 tons/year)

2.5 Highway Source Category Emissions

2.5.1. Control Measures

Assumptions for vehicle emission standards have not been changed significantly in the modeled analysis from when the Department submitted the Scranton/Wilkes Barre Ozone Maintenance Plan to EPA. Pennsylvania began implementation of California emission standards, which are incorporated by reference in Pennsylvania regulations, in 2005 for diesel-powered heavy-duty trucks, and in 2008 for passenger cars and light-duty trucks.

In January 2012, the California Air Resources Board (CARB) approved significant revisions to its regulations for criteria pollutant and greenhouse gas emissions from passenger cars, light-duty trucks and medium-duty vehicles. The amendments, referred to as LEV III, were approved by California's Office of Administrative Law (OAL) on August 7, 2012, and will become effective in model year (MY) 2015 for criteria pollutants and in MY 2017 for greenhouse gases. The requirements were automatically incorporated by reference as part of the Pennsylvania Clean Vehicles Program, to the extent the amendments apply to Pennsylvania's program, under 25 *Pa. Code* §126.411.

On August 28, 2012, the EPA and the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) issued a joint Final Rulemaking to extend the National Program of harmonized greenhouse gas and fuel economy standards to MYs 2017-2025 passenger vehicles. On May 21, 2013, the EPA proposed emission standards for MYs 2017-2025 light duty, medium duty, and some heavy duty vehicles, referred to as Tier 3 emission standards, as well as sulfur content standards for fuel in a proposed rulemaking (78 FR 29816).

The mobile source modeling for this proposed SIP revision was completed prior to the publication of the proposed Tier 3 standards, and, as a result, the impact of the proposed standards was not included in the modeling. The California LEV III rulemaking, the EPA-NHTSA National Program Final Rulemaking, and the EPA Tier III Proposed Rulemaking have

not been analyzed as to their effect on future year emission estimates of NO_X in this proposed SIP revision. However, it is reasonable to assume that NO_X and VOC emissions will decrease as these vehicles replace older vehicles during fleet turnover in Pennsylvania and the rest of the country.

2.5.2. Growth Estimates

Overall emissions from highway vehicles will continue to decrease as new vehicles take the place of older vehicles during normal fleet turnover. There are a variety of different reasons for this continued decrease. Fleet turnover is the greatest driver in lowering emissions from highway vehicles. Fleet turnover has been slower than forecast in the Scranton/Wilkes-Barre Ozone Maintenance Plan. This is, in part, a result of the recent recession and its lingering effects. Other factors have some impact on emissions from the highway source category, such as changes in fleet age, vehicle miles traveled, and the fleet mix of vehicles. The fleet age is increasing as people operate their vehicles for a longer period of time. This will reduce the rate of fleet turnover and the reductions expected in emissions. Also, nationally, there was a slight decline in VMT during the recession. The percentage of vehicles in Pennsylvania that are light-duty trucks is also shrinking. Consumers are purchasing more passenger cars than light-duty trucks. Passenger cars tend to have lower emissions.

Both NO_X emission estimates in this proposed SIP revision were developed using MOVES2010a and the latest planning assumptions. Emissions have been estimated for the 2004 (attainment year), 2009 (interim year) and 2018 (maintenance year). The MOBILE6.2 emission estimates used in the Scranton/Wilkes-Barre Maintenance Plan have been included in Table 11 to illustrate relative changes in emissions.

Table 10: Revised Motor Vehicle Emissions Estimates Using MOVES2010a for the Entire Scranton/Wilkes-Barre Area

Pollutant	Original MOBILE6.2 Emissions			Revised MOVES2010a Emissions		
	2004	2009	2018	2004	2009	2018
VOC	31.6	23.3	14.3	N/A	N/A	N/A
NO_X	66.1	46.9	21.6	77.0	57.3	28.5

Table 11 shows that the MOVES model estimates NO_X emissions in 2009 and 2018 exceed the MOBILE6.2-derived emissions estimates in the Scranton/Wilkes-Barre Ozone Maintenance Plan. This would cause transportation planning emissions estimates using MOVES to exceed the MVEBs. The updated NO_X MVEBs provided in Table 12 will help ensure that the MPO and RPOs in the Scranton/Wilkes-Barre Area can demonstrate transportation conformity using MOVES2010a, while the emissions estimates still demonstrate that the Scranton/Wilkes-Barre Area demonstrates attainment with, and continued maintenance of the 1997 8-hour ozone NAAQS.

2.5.3. Mobile Source Category Conclusion

The proposed SIP revision includes revised NO_X MVEBs for the Scranton/Wilkes-Barre Area using updated highway vehicle emissions estimates derived from MOVES. Appendix C in this proposed SIP revision replaces the corresponding sections of the original Appendix C in the Scranton/Wilkes-Barre Ozone Maintenance Plan. Appendix C in this proposed SIP revision describes the highway modeling methodology necessary to produce accurate emission estimates from the MOVES model.

3. Safety Margins

A safety margin is the amount of emissions by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for reasonable further progress, attainment, or maintenance (40 CFR 93.101). Tables 3 and 4 show that the emissions in the maintenance years, even when using the conservative emission estimates in the Scranton/Wilkes-Barre Ozone Maintenance Plan, for point, area and nonroad sectors, provide a significant safety margin potential for continued maintenance of the maintenance of the 1997 8-hour ozone NAQQS.

Therefore, a portion of those safety margins is being allocated to transportation projects (See Tables 2a, 2b, and 2c) to help ensure that any future planning assumption updates will not negatively impact the area's ability to demonstrate transportation conformity. Adequate transportation safety margins will also defer the need for future SIP revisions, where the purpose of the SIP revision is only to update numbers and not to document any actual emissions reductions to the atmosphere.

To help ensure that the transportation conformity process is not needlessly delayed, a 2.0 tons/summer day safety margin for NO_X has been applied to the MVEBs in 2009 and a 2.0 tons/summer day safety margin for NO_X has been applied to the MVEB in 2018. The safety margin is for the entire Scranton/Wilkes-Barre Area, which contains three MPOs and RPOs: the Scranton Wilkes-Barre MPO, the Northern Tier RPO, and the Northeast Pennsylvania Alliance (NEPA) MPO. The safety margins are uniformly distributed among these MPOs and RPOs based on the percentage of highway emissions that each MPO or RPO contributes to the area total. The Scranton Wilkes-Barre MPO contributes 70 percent of emissions to the maintenance area, the Northern Tier RPO contributes 25 percent of the emissions and the NEPA RPO contributes 5 percent. All indications are that the 2009 and 2018 emission estimates made for point, area and nonroad sources in the Scranton/Wilkes-Barre Ozone Maintenance Plan are higher than the actual emissions for 2009 and revised estimates for 2018 in this SIP revision. Table 2 quantitatively shows that these safety margins will continue to allow the area to remain well below the 2004 attainment year emissions inventory cap, thereby ensuring that future air quality will continue to meet the 1997 ozone NAAQS.

4. Motor Vehicle Emission Budgets for Transportation Conformity

The Department proposes to establish budgets for highway emissions in order to ensure that transportation emissions do not impede clean air goals in the next decade and beyond. The information in Table 12, once EPA approves it for the purposes of transportation conformity, will establish MVEBs for the Scranton/Wilkes-Barre Area. The MVEBs are exhibited for the MPO and RPOs in the Scranton/Wilkes-Barre Area.

Table 11: Motor Vehicle Emissions Budgets

Metropolitan Planning Organization	Counties	Calendar Year	Pollutant	
			NO_X	VOC
Scranton/ Wilkes-Barre MPO	Lackawanna, Luzerne	2009	42.67 tons/summer day 38,710 kg/summer day	17.99 tons/summer day 16,320 kg/ summer day
Scranton/Wilkes-Barre MPO	Lackawanna, Luzerne	2018	21.90 tons/summer day 19,867 kg/summer day	11.80 tons/summer day 10,704 kg/summer day
Northeastern Pennsylvania Alliance RPO	Monroe	2009	14.10 tons/summer day 12,791 kg/summer day	6.19 tons/summer day 5,615 kg/summer day
Northeastern Pennsylvania Alliance RPO	Monroe	2018	7.10 tons/summer day 6,441 kg/summer day	4.64 tons/summer day 4,209 kg/summer day
Northern Tier RPO	Wyoming	2009	2.50 tons/summer day 2,268 kg/ summer day	0.99 tons/summer day 898 kg/ summer/day
Northern Tier RPO	Wyoming	2018	1.60 tons/summer day 1,452 kg/summer day	0.54 tons/summer day 489 kg/summer day

5. Conclusion

By examining actual and projected emissions, increased controls for all emissions categories, and evidence that actual emissions growth for point source, area source, and nonroad source categories has been less than the projected emissions growth in the approved Scranton/Wilkes-Barre Ozone Maintenance Plan, the Department has shown that the conclusion in the Scranton/Wilkes-Barre Ozone Maintenance Plan that the Scranton/Wilkes-Barre Area will continue to attainment of the 1997 ozone NAAQS remains valid, after updating the highway emissions estimates using the new EPA-approved MOVES model. Updating NO_X emissions in the MVEB will not negatively affect the Scranton/Wilkes-Barre Area's ability to maintain the 1997 ozone NAAQS. In this proposed SIP revision, the Department has updated emissions of NO_X and growth factors for NO_X that were included in the Scranton/Wilkes-Barre Ozone Maintenance Plan for point, area, and highway sources. Emissions of nonroad sources were not updated because the growth in emissions for those sources was not updated because growth in emissions for those sources decreased or were unaffected.