Revision to the Allegheny County Portion of the Pennsylvania State Implementation Plan

Supplement to the Attainment Demonstration for the Liberty-Clairton $PM_{2.5}$ Nonattainment Area 2006 Standards

Allegheny County Health Department
Air Quality Program

May 13, 2014

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ACRONYMS AND ABBREVIATIONS

ACHD	Allegheny County Health Department
BHSTE	Bureau of Highway Safety and Traffic Engineering
BPR	Bureau of Public Roads
CAIR	Clean Air Interstate Rule
CA LEV II	California Low Emission Vehicle II Program
CAMD	Clean Air Markets Division
CFR	Code of Federal Regulations
CSAPR	Cross-State Air Pollution Rule
DSI	Dry Sorbent Injection
ECO	Electro-Catalytic Oxidation
EGU	Electric Generating Unit
EPA	The United States Environmental Protection Agency
FHWA	Federal Highway Administration
FR	Federal Register
FEM	Federal Equivalent Method monitor
FGD	Flue Gas Desulfurization
FRM	Federal Reference Method monitor
GHG	Greenhouse Gas
GVWR	Gross Vehicle Weight Rating
HPMS	Highway Performance Monitoring System
I/M	Inspection and Maintenance Program
MANE-VU	Mid-Atlantic/Northeast Visibility Union
MOVES	Motor Vehicle Emission Simulator model
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
MVEB	Motor Vehicle Emissions Budget
µg/m³	Microgram per cubic meter
µm	Micrometer, or micron
NAAQS	National Ambient Air Quality Standard
NAA	Nonattainment Area
NEI	National Emission Inventory (EPA database)
NH_3	Ammonia
NLEV	National Low Emission Vehicle Program
NO_x	Oxides of Nitrogen
NTD	National Transit Database
OBD II	On-Board Diagnostics
PA DEP	Pennsylvania Department of Environmental Protection
PCV	Pennsylvania Clean Vehicles Program
PennDOT	Pennsylvania Department of Transportation
PM	Particulate Matter (airborne) of any size
$PM_{2.5}$	Particulate Matter less than or equal to a nominal 2.5 microns in aerodynamic diameter, also referred to as fine particulates
PM_{10}	Particulate Matter less than or equal to a nominal 10 microns in aerodynamic diameter

RACM	Reasonably Available Control Measure
RACT	Reasonably Available Control Technology
RMS	Roadway Management System
RPO	Regional Planning Organization
RTO	Regional Transmission Organization
RVP	Reid Vapor Pressure
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxides
SPC	Southwestern Pennsylvania Commission
SWPA	Southwestern Pennsylvania
TCM	Transportation Control Measure
TIGER	Topologically Integrated Geographic Encoding and Referencing
TR	Transport Rule
TS|Pechan	TranSystems|E.H. Pechan & Associates
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound

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1 Executive Summary

On June 21, 2013, the Pennsylvania Department of Environmental Protection (PA DEP) submitted to the United States Environmental Protection Agency (EPA) Region III a revision to the State Implementation Plan (SIP) pertaining to the attainment demonstration for the 2006 $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS) for the Liberty-Clairton nonattainment area. This SIP revision is a supplement to that submittal and the Allegheny County Health Department (ACHD) SIP document dated May 10, 2013.

$PM_{2.5}$ describes particulate matter that is less than or equal to 2.5 micrometers (µm, or micron). In 1997, EPA promulgated the $PM_{2.5}$ NAAQS of 15.0 µg/m³ on an annual basis and 65 µg/m³ on a 24-hour basis. In 2006, the 24-hour $PM_{2.5}$ standard was lowered to 35 µg/m³.[1]

Most of the Pittsburgh Metropolitan Statistical Area (MSA) was designated as an 8-county nonattainment area for the 1997 and 2006 $PM_{2.5}$ NAAQS, called the Pittsburgh-Beaver Valley area. A portion of southeastern Allegheny County, the Liberty-Clairton area, was designated as a separate nonattainment area within the larger Pittsburgh-Beaver Valley area (areas shown in Figure 1-1 below).

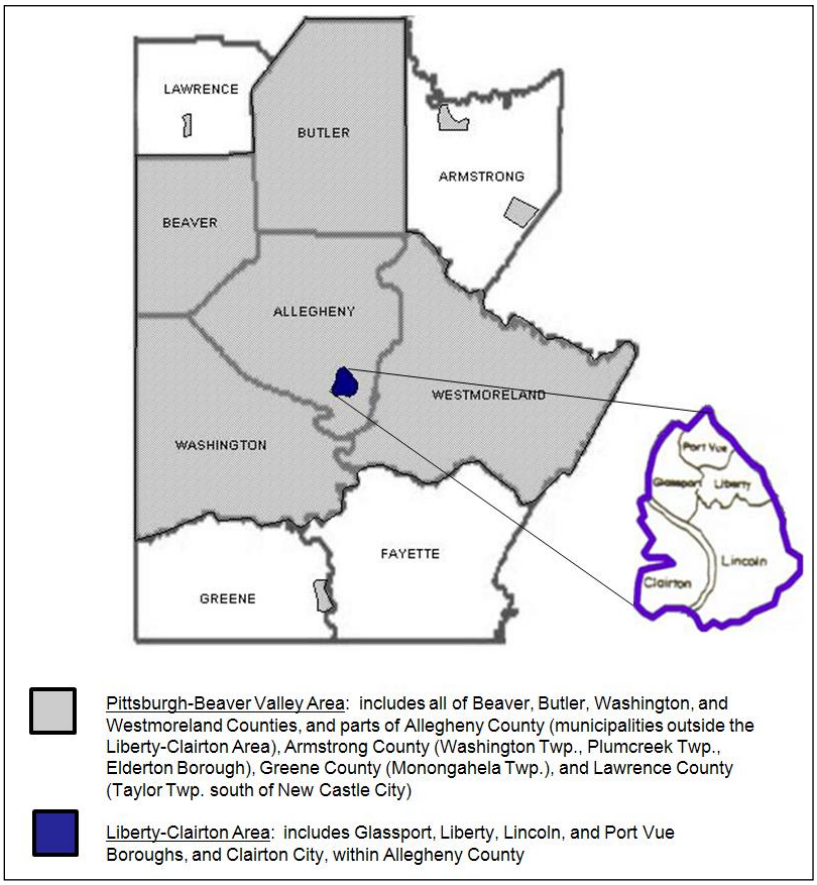

Figure 1-1. Map of the Liberty-Clairton Area within the Pittsburgh-Beaver Valley Area

[1] EPA NAAQS: http://www.epa.gov/air/criteria.html

The June 21, 2013 SIP submittal provided a control strategy and attainment demonstration for the 2006 $PM_{2.5}$ NAAQS for the Liberty-Clairton nonattainment area. Using emissions inventories and modeling already included as part of the June 21, 2013 SIP submittal, this supplemental SIP revision demonstrates that motor vehicle emissions for direct $PM_{2.5}$ and NO_x are insignificant contributors to the air quality problem in the Liberty Clairton nonattainment area for both the 1997 and 2006 $PM_{2.5}$ NAAQS. As a result, in accordance with the rules established in 40 CFR 93.109(f) and under EPA approval of the insignificance findings, the area would not be required to submit motor vehicle emissions budgets (MVEBs) for direct $PM_{2.5}$ and NO_x or satisfy the emissions analysis for 40 CFR 93.118 or 40 CFR 93.119 for either the 1997 or 2006 $PM_{2.5}$ NAAQS.

Additionally, pursuant to 40 CFR 93.102(b)(2)(v), the area is not required to satisfy the emissions analysis requirements of either 40 CFR 93.118 or 93.119 for SO_2, VOC, or NH_3 because the submitted SIP did not establish motor vehicle emissions budgets for any of these precursors as part of an attainment strategy.

The modeling demonstration for mobile sources was performed using the Motor Vehicle Emissions Simulator (MOVES) model. Years included in the inventory and modeling were 2007 for the baseline case, and 2014 for the future projected case.

This supplemental SIP revision also updates and revises the projected electric generating unit (EGU) emissions analysis included in the June 21, 2013 SIP submittal. Although the Clean Air Interstate Rule (CAIR) remains in place for EGU emissions allocations, the future case 2014 Cross-State Air Pollution Rule (CSAPR) inventory was used for the modeling demonstration since it reflected a more representative inventory. This supplemental SIP revision provides an updated and more detailed analysis of current and expected EGU emissions to support the use of CSAPR in the modeling demonstration.

2 Transportation Conformity Analysis

2.1 Problem Statement

Section 176 of the Clean Air Act (CAA) provides a mechanism by which federally funded or approved highway and transit plans, programs, and projects are determined not to produce new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS or delay any interim milestones. EPA regulations in 40 CFR Part 93 pertaining to transportation conformity provide that motor vehicle emission "budgets" establish caps of these emissions that cannot be exceeded by the predicted transportation system emissions in the future.

Transportation agencies in Pennsylvania are responsible for making timely transportation conformity determinations. The responsible agency in the Pittsburgh area is the Southwestern Pennsylvania Commission (SPC), the designated Metropolitan Planning Organization (MPO) under federal transportation planning requirements.

40 CFR 93.102 requires conformity determinations to be applicable to direct emissions of $PM_{2.5}$ and NO_x (unless a determination is made that transportation-related emissions are not significant contributors to $PM_{2.5}$), and to emissions of SO_2, VOC, and NH_3 only if the applicable SIP or SIP submittal establishes an approved or adequate motor vehicle emissions budget as part of a reasonable further progress, attainment, or maintenance strategy.

The June 21, 2013 SIP submittal showed that controls for VOC and NH_3 contributed minimally to modeled reductions and that SO_2 emissions from mobile sources are very small in comparison to those from stationary sources. Therefore, MVEBs were not established for these precursors.

2.2 Insignificance Statement

Federal transportation conformity requirements in 40 CFR Part 93.109 allow for pollutants/precursors to be exempt from conformity analysis under certain circumstances.

> **40 CFR 93.109(f) Areas with insignificant motor vehicle emissions**.
> Notwithstanding the other paragraphs in this section, an area is not required to satisfy a regional emissions analysis for §93.118 and/or §93.119 for a given pollutant/precursor and NAAQS, if EPA finds through the adequacy or approval process that a SIP demonstrates that regional motor vehicle emissions are an insignificant contributor to the air quality problem for that pollutant/precursor and NAAQS. The SIP would have to demonstrate that it would be unreasonable to expect that such an area would experience enough motor vehicle emissions growth in that pollutant/precursor for a NAAQS violation to occur. Such a finding would be based on a number of factors, including the percentage of motor vehicle emissions in the context of the total SIP inventory, the current state of air quality as determined by monitoring data for that NAAQS, the absence of SIP motor vehicle control measures, and historical trends and future projections of the growth of motor vehicle emissions. . . *{emphasis added}*

For the reasons outlined in Sections 2.4 through 2.7 of this document, ACHD has determined that highway emissions of direct $PM_{2.5}$ and NO_x are insignificant contributors to the nonattainment of the 1997 and 2006 $PM_{2.5}$ NAAQS for the Liberty-Clairton area and that no motor vehicle emissions budgets are required for this nonattainment area and that the area should not be required by EPA to satisfy a regional emissions analysis for §93.118 or §93.119 for direct $PM_{2.5}$ and NO_x.

2.3 Onroad Mobile Source Inventory Development

This section describes the approach used to develop the onroad mobile source inventory for the Liberty-Clairton area, including a discussion of the data sources, parameters, and overall analysis approach. The highway inventory utilizes EPA's new emission model, the Motor Vehicle Emissions Simulator (MOVES). The analysis approach and data assumptions were consistent with EPA technical guidance and other statewide inventories conducted by PA DEP. This included the use of roadway and traffic count data from the Pennsylvania Department of Transportation (PennDOT), accepted post processing software to estimate hourly speeds, and traffic and vehicle population growth rates utilizing available PennDOT and regional data sources. Other traffic, environmental, vehicle fleet, fuel, and control strategy inputs have been prepared using the latest local-specific planning assumptions.

2.3.1 Model

MOVES2010a was used as the most recent version of the MOVES software. MOVES2010a represents a significant departure from the previous MOBILE6.2 model, including new vehicle emission rates reflecting the latest regulations pertaining to fuel efficiency and vehicle emission standards.

MOVES2010a results can depend upon the unique circumstances of each nonattainment or maintenance area. The emission comparisons to MOBILE6.2 depend very heavily on the pollutants of concern, the dates of concern, and on existing local control measures, traffic patterns, fleet age, and the mix of cars and trucks. In some cases, a change from MOBILE6.2 to MOVES2010/MOVES2010a may result in increased emissions estimates, while in other cases it may result in decreased emissions estimates for various time periods.[2]

Over the last ten years, EPA's in-use data about technologies such as Tier 2, second-generation onboard diagnostics (OBD II), and enhanced evaporative emission control systems have dramatically improved. For MOVES2010, EPA has been able to carefully study these newer technologies, examining millions of results for light-duty vehicles. A detailed analysis of 70,000 vehicles in Arizona's Inspection and Maintenance (I/M) program provided information on how vehicles from the late-1990's and early 2000's age. Other I/M and remote sensing data and special purpose studies helped EPA to better understand trends in VOC, CO, and NO_x emissions for light-duty cars and trucks. In reviewing these data, EPA found little change in CO from the

[2] EPA MOVES web site: http://moves.supportportal.com/link/portal/23002/23024/Article/32004/How-are-the-changes-in-emission-rates-in-MOVES2010-or-MOVES2010a-expected-to-affect-attainment-demonstrations

original MOBILE6.2 projections, lower VOC emissions, and a noticeable increase in NO_x emissions.

Also in support of MOVES2010 development, EPA conducted a landmark study of PM emissions, testing nearly 500 gasoline-fueled light-duty cars and trucks in Kansas City, MO. Due to the technical difficulties associated with measuring PM emissions, the Kansas City study – a collaborative effort including EPA, DOT, the Department of Energy (DOE), and the automotive and petroleum industries – was the largest such study ever conducted. The Kansas City study confirmed that PM emissions from light-duty gasoline-fueled vehicles are higher than earlier predicted, and clearly showed that cold ambient temperatures can dramatically increase PM start emissions. The MOVES2010 model includes these increases in PM start emissions at low temperatures.

EPA's understanding of emissions from heavy-duty vehicles has continued to improve since MOBILE6.2 was issued. Most earlier heavy-duty emission rates were based on certification tests of then-new, mid-1990's engines. For MOVES2010, EPA has been able to analyze data on more than 400 in-use trucks, some in the laboratory and some with on-road measurement equipment. This allowed EPA to understand how real trucks pollute at a range of speeds and driving conditions. EPA also has been able to better incorporate emissions from heavy-duty diesel crankcase ventilation and from extended idling (also known as "hotelling") – two emission processes that were relatively unstudied at the time MOBILE6.2 was developed. The incorporation of this additional data accounts for the increases in heavy-duty NO_x and PM emissions reflected in MOVES2010. Emission differences in MOVES2010 are especially large for heavy-duty PM emissions because they reflect updated data on the effects of both speed and vehicle deterioration not previously available.[3]

In MOBILE6.2, PM emission rates had little or no variation due to vehicle speed, deterioration or aging effects, or ambient temperature. The development of MOVES included the incorporation of the results of significant amounts of vehicle testing that was not included in MOBILE6.2. Thus, within MOVES, the PM emission rates now vary depending on the temperature, speed, and age of vehicles. The relative effect of each of these factors will also differ from year to year, as different emission standards are phased into the fleet, since the percentage change from the base MOBILE6.2 PM emissions rates to the MOVES base emission rates varies by model year.

[3] Taken from "EPA Releases MOVES2010 Mobile Source Emissions Model: Questions and Answers," EPA-420-F-09-073, U.S. EPA, Office of Transportation and Air Quality, December 2009: http://www.epa.gov/otaq/models/moves/420f09073.pdf

2.3.2 Emissions/Modeling Assistance

As described in the SIP submittal of June 21, 2013, ACHD contracted TranSystems|E.H. Pechan & Associates (TS|Pechan) to conduct an in-depth investigation of transportation sources of $PM_{2.5}$ in southern Allegheny County.[4]

Specifically, TS|Pechan reviewed existing $PM_{2.5}$ inventories and related documents for local mobile sources. The review included field work, records and data searches, and calculations necessary to develop 2007 and projected 2014 mobile source inventories. Furthermore, TS|Pechan performed a reasonably available control measures (RACM) analysis, which included examining reasonably available control technology (RACT), on all mobile sources listed in the revised 2007 SIP emissions inventory.

2.3.3 Interagency Consultation

The analysis methodologies and data sources have undergone review from multiple agencies. The Pennsylvania Transportation Air Quality Working Group, a state-wide interagency consultation group including federal (EPA, Federal Highway Administration (FHWA)), state (PennDOT, PA DEP), and regional (MPOs) agencies, has played a key role in reviewing the MOVES emission calculation process, local data sources, and methods in determining future growth for vehicle miles of travel (VMT) and vehicle population.

[4] ACHD contract title *Consultant Technical Support for Air Pollutant Area and Mobile Sources Analyses*.

2.3.4 Methodology

Guidance documents from EPA were used to develop the base and future year emissions inventories for the Liberty-Clairton 2006 $PM_{2.5}$ NAAQS nonattainment area (NAA) and include:

- *Policy Guidance on the Use of MOVES2010 for SIP Development, Transportation Conformity, and Other Purposes,* EPA Office of Air and Radiation, EPA-420-B-09-046, December 2009 (EPA, 2009)
- *Technical Guidance on the Use of MOVES2010 for Emission Inventory Preparation in State Implementation Plans and Transportation Conformity,* EPA Office of Air and Radiation, and Office of Transportation and Air Quality, EPA-420-B-10-023, April 2010 (EPA, 2010a)
- *Motor Vehicle Emission Simulator, User Guide for MOVES2010a*, EPA-420-B-10-036, August 2010 (EPA, 2010b)

The highway mobile source emission inventory was developed using available travel data and EPA's MOVES2010a emission model. The methodologies used in the development of this inventory conform to the recommendations provided in EPA's Technical Guidance, cited above. A mix of local data and national data (internal to MOVES2010a) has been used for this submission. Local data was used for the more significant inputs into the process and include:

- Vehicle miles traveled by vehicle type (VMT)
- Average speed distribution
- Vehicle type mixes
- Source type population (for light-duty vehicles)
- Vehicle age distribution
- Hourly distributions
- Meteorology data
- Inspection/Maintenance (I/M) program
- Fuel supply

The data used reflects the latest planning assumptions and is primarily based on data assembled from PennDOT's Bureau of Motor Vehicles, the local MPO (SPC) and other local/national sources. Where available, 2007 data was used, however, 2008 data (projected back to 2007) that had already been vetted by stakeholders was also used as appropriate.

The analysis methodology is consistent with past statewide inventory efforts, including the 2008 National Emissions Inventory (NEI) submission. This includes the use of custom post processing software to calculate hourly speeds and prepare key traffic input files to the MOVES2010a emission model.

Analysis Tools

The mobile vehicle emissions inventory analysis utilizes several key software/programs for producing the county emissions totals. These tools are outlined in Table 2-1.

Table 2-1. Summary of Analysis Tools

Tool	Purpose
MOVES2010a	Produces emission rates for each $PM_{2.5}$ precursor
PPSUITE	Processes the highway data; calculates hourly congested speeds for each state roadway segment; prepares MOVES2010a input files; processes MOVES2010a output files into a summary report.
CENTRAL	Provides a batch menu driven process to execute PPSUITE, MOVES2010a, and other MYSQL steps.

The Liberty-Clairton $PM_{2.5}$ onroad inventory was developed using EPA's MOVES2010a emission model. EPA's MOVES model was officially released on March 2, 2010 and was followed with a revised version (MOVES2010a) in August 2010. The MOVES2010a model provides a more robust estimate of emissions as compared to its predecessor MOBILE6.2. MOVES2010a has been integrated with local traffic, vehicle fleet, environmental, fuel, and control strategy data to estimate emissions.

PPSUITE is an enhanced version of the Post Processor for Air Quality software system that has been used for previous inventory and conformity submissions in Pennsylvania. The software has undergone significant revisions to ensure consistency with the MOVES2010a. PPSUITE was used to calculate hourly congested speeds for each roadway link, apply vehicle type fractions, aggregate VMT, prepare MOVES2010a traffic-related input files, and process MOVES2010a outputs. The PPSUITE software and process methodologies are consistent with that used for state inventories and transportation conformity analyses throughout Pennsylvania.

CENTRAL is a menu-driven software platform that executes the PPSUITE and MOVES2010a processes in batch mode. The software allows users to execute runs with a variety of input options and integrates custom MYSQL steps into the process. CENTRAL provides important quality control and assurance steps including file naming and storage automation.

Data Sources

The latest planning assumptions were used in preparing inputs to the MOVES emission model. The data includes Allegheny County specific parameters regarding temperatures, fuel, and fleet age. Specific traffic conditions and vehicle population have been prepared for the Liberty-Clairton nonattainment area. Much of the data has been prepared as part of inventory efforts in support of statewide analyses for the PA DEP, and has undergone review and acceptance by the Pennsylvania Transportation Air Quality Working Group, the interagency consultation group that consists of EPA, FHWA, PennDOT, PA DEP, and MPOs (SPC in this case).

Table 2-2 outlines all of the major data sources and processes proposed for this effort. The subsequent sections expand on these in greater detail.

Table 2-2. Summary of Mobile Source Data Parameters for Liberty-Clairton

Parameter	Source
Analysis Years	2007, 2014
Season	Annual – 12 Month Approach – 1 representative day per month
MOVES Domain / Calculation type	County / Inventory Mode
Pollutants	$PM_{2.5}$, NO_x, SO_2, NH_3, VOC
Emission Calculation Method	Inventory Mode
Area	Liberty Clairton
Traffic Inputs	
VMT Data Source	2008 PennDOT Roadway Management System (RMS) "Snapshot" Integrated with PennDOT BHSTE GIS Signal Locations
VMT Adjustments	For 2008-2007: Highway Performance Monitoring System (HPMS) County by Functional Class VMT For 2008-2014: Functional Class VMT & Growth Rates based on SPC Regional Travel Demand Model
Local VMT Adjustments	Using GIS, the portion of TIGER local roadway mileage in the nonattainment-maintenance area vs. county total – Apply ratio to the total HPMS local VMT reported for the county
Seasonal Adjustments	Traffic Data Report PennDOT Bureau of Public Roads (BPR) (2008 Data)
Hourly Patterns	Traffic Data Report PennDOT BPR (2008 Data)
Annual VMT	Calculated by PPSUITE
Hourly Speeds	Calculated by PPSUITE (Minimum Speed = 2.5 miles per hour)
Road Type Distribution	Calculated by PPSUITE; User assigned Road Type to RMS links
MOVES Inputs	
Vehicle Age Distribution	2010 registration data for light-duty vehicles from PennDOT's Bureau of Motor Vehicles Registration Database; MOVES Defaults for Heavy-Duty Vehicles
Fuel Parameters (Gasoline/Diesel)	MOVES2010a default data (except for gasohol market penetration and Reid vapor pressure (RVP) values, which were updated)
I/M Parameters	PA OBD II & Idle (Changes made to default I/M Program Parameters)
Temperatures	10-year monthly average hourly airport temperatures - humidity from WeatherBank, Inc. (www.weatherbank.com)
Month VMT Fractions	Calculated based on seasonal adjustment factors
Day VMT Fractions	Calculated based on seasonal adjustment factors
Hour VMT Fractions	Calculated by PPSUITE
Ramp Fraction	MOVES Defaults (8% of vehicle hours traveled)
Source Type Population	2007 - Based on 2008 registration data and MOVES default VMT and population. 2014 - Based on projected household growth from Woods and Poole Inc. (Methodology approved by PA Transportation Air Quality Working Group, consisting of EPA, FHWA, DEP, Penn DOT.)
Early NLEV/PCV/CA LEV II	EPA provided MOVES override database files
Stage II	MOVES Default Process
Alternative Vehicle Technology	MOVES Default (no input file provided)

Base Traffic Data/Fleet Data Inputs

a. Baseline Traffic Volumes

The 2008 PennDOT RMS database serves as the primary source for the county and functional class VMT estimates and roadway volumes for the baseline traffic data. The RMS has been updated to provide a "snapshot" of the regional roadway system and traffic volumes in 2008 and also includes traffic signal locations. As 2007 RMS data was not readily available, HPMS data was used to factor the 2008 volumes back to 2007 levels, with individual adjustment factors calculated for each of the functional classes as they exist in the RMS database and are represented in the NAA. This procedure applies to all VMT, gasoline and diesel. Note that there are no limited access freeways or expressways within the Liberty-Clairton NAA and, as a result, growth factors were not developed for these roadway classifications.

The RMS database only includes roadways maintained by PennDOT. As a result, a significant number of local roadways are not fully represented in the database. PennDOT has procedures to estimate county local VMT as part of the HPMS reporting system. For the Liberty-Clairton inventory, local VMT was estimated as a percentage of the Allegheny County total. Using GIS, the portion of Topologically Integrated Geographic Encoding and Referencing (TIGER) local roadway mileage in the nonattainment area was calculated and compared to the total county mileage to estimate the relative portion.

The local VMT estimation for the nonattainment area was first derived using 3 different methods: 1) The PennDOT maintained Road Management System (RMS) was queried. GIS software was used to determine all local roadways within the nonattainment area, with VMT calculated directly from the data in that dataset. 2) The Census TIGER GIS file was used to determine the total roadway centerline mileage both within the nonattainment area and within the county as a whole. The ratio of the mileage within the nonattainment area to the total county mileage was use to allocate the total local roadway VMT as reported in the Federal HPMS for Allegheny County. 3) The percent of population (residents) within both the nonattainment area and the county as a whole was determined using census data. The ratio of these values was then applied to the local roadway VMT reported in the Federal HPMS database to obtain an estimate.

The method reporting the greatest local roadway VMT, used to be conservative, was the second method using roadway centerline mileage. The ratio was 1.76% of the total Allegheny County local VMT falling within the nonattainment area boundaries.

b. Seasonal Adjustments

The PPSUITE framework developed for this analysis calculates annual emissions by running MOVES for a single representative day for each month of the year (12 runs). Per the MOVES Technical Guidance option, monthly analyses were conducted only for the weekday option and factored to represent monthly/annual totals. The daily and monthly seasonal adjustment factors were developed from data contained in the document: *2008*

Pennsylvania Traffic Data Report, prepared by PennDOT's Bureau of Public Records (BPR, PennDOT, 2008). The seasonal and daily factors are based on statistical analyses of 2008 traffic counts taken at permanent and in-pavement automatic traffic recorders.

c. Congested Speeds

PPSUITE calculates congested speeds by hour of the day for each roadway segment and provides the information as input to the MOVES2010a software. The speed calculations found in PPSUITE are a variation of the BPR speed-flow formula and are fully consistent with the guidance provided by EPA and FHWA. To disaggregate the daily RMS volumes to hourly values, auto and truck hourly pattern data from PennDOT's *2008 Pennsylvania Traffic Data Report* were used to develop distributions of traffic by hour, which in turn were used to create an input file used by PPSUITE in its internal calculations.

d. Vehicle Population

Vehicle population is a key component in the calculation of start and evaporative emissions. MOVES2010a requires vehicle population by 13 source types in order to determine evaporative emissions. Data from PennDOT registrations were first used to estimate county-specific values. Allegheny County 2008 vehicle registration data was used to estimate vehicle population for light-duty vehicles and school buses. For transit buses, data from PennDOT and the National Transit Database (NTD) were used to estimate transit bus populations for the county. Next, the county information was factored to represent the Liberty-Clairton portion of the region. These adjustment factors were based on the proportion of population in the nonattainment area as compared to the county total. For all other heavy-duty vehicles, MOVES2010a national default vehicle mileage accumulation rates were applied to regional heavy-duty VMT to estimate heavy-duty vehicle population. This methodology is consistent with the approach used in other areas in PA with nonattainment areas that do not constitute an entire county. The approach is also consistent with EPA recommended practice. No other sufficiently vetted data source was identified that would allow for additional refinement and meet the minimum requirements for data robustness.

Vehicle mileage accumulation by age is accounted for internally in the MOVES model. The MOVES table SourceTypeAge lists for each source type by age the relative annual mileage accumulation rate, the annual per vehicle mileage accumulation for a given MOVES SourceUseType and age, relative to the highest annual mileage accumulation rate within the HPMS Vtype. This is a national default MOVES table, not typically modified by MOVES users. The relative mileage accumulation rates are used to weight the age distribution data, essentially yielding a VMT-based age distribution. As an example, a 5-year old single unit short-haul truck has a relative mileage accumulation rate of 0.306 while a 10-year old single unit short-haul truck has a relative mileage accumulation rate of 0.187. Thus, the MOVES model assumes that each 5-year old single-unit short haul truck is being driven about 64% more than a comparable 10-year old truck per year. These mileage accumulation rates are used in combination with the

age distribution data to determine the by-model-year weight of the by-model-year emission rates.

Only a single relative mileage accumulation rate is used for each model year and source use type combination. Therefore, data on the mileage accumulation rates of all 5-year-old trucks (of a given source use type) would be considered to determine the weighted average accumulation rate of 5-year-old trucks.

e. VMT by Source Type

For input to the MOVES model, total VMT must be disaggregated into the six HPMS vehicle groups (passenger cars, other 2-axle light trucks, buses, single-unit trucks, combination trucks, motorcycles). This input is done internally by PPSUITE based on the vehicle mix patterns provided as input to the software. For this inventory, the vehicle mix patterns were calculated utilizing a combination of the following sources:

- 2008 RMS truck percentages
- PennDOT and 2008 NTD transit data
- 2008 school bus registration data
- EPA's MOVES2010a default distribution for all other source types

The functional class groupings used in PPSUITE are necessary for HPMS reporting, however, they are not compatible with MOVES2010a. As a final step, PPSUITE re-aggregates the VMT into MOVES2010a's roadway classifications. This step is somewhat redundant as all roadways in the Liberty-Clairton $PM_{2.5}$ NAA are classified in MOVES2010a as urban, non-restricted.

f. Vehicle Age Distribution

Vehicle age distributions for each of the 13 source types are a required input into MOVES2010a and PPSUITE. The distributions reflect the percentage of vehicles in the fleet up to 31 years old and must total 100 percent. Recent 2010 registration data from PennDOT's motor vehicles registration database has indicated a substantially older fleet than recorded in the 2002-2008 period. As such, the 2010 vehicle age distributions have been used for this inventory. Due to insufficient data, only data for light-duty vehicles are used; heavy-duty vehicle age distributions are based on the MOVES2010a defaults for Allegheny County. As the registration data downloaded was based on MOBILE6.2 vehicle categories, the data was converted to source types using the EPA convertor spreadsheets provided with the MOVES2010a emission model.

The MOVES 2010a registration data defaults for Allegheny County are national defaults for heavy-duty vehicles, relative to the calendar year being modeled. This is appropriate for heavy-duty vehicles, per the EPA guidance, as heavy-duty vehicles frequently operate in areas outside of the area in which they are registered.

I/M and Fuel Parameters

a. I/M Program

The I/M program inputs to the MOVES2010a model are based on past and current programs at the county level (all Pennsylvania I/M programs are based on county boundaries). The MOVES2010a model has simplified the I/M program input parameters compared to MOBILE6.2. The default I/M program parameters included in MOVES2010a were examined and changes made to the defaults to match the actual local program.

The Pennsylvania I/M program was upgraded and expanded throughout the state with a phase-in period starting in September 2003 and was fully implemented by June 2004. The program requirements vary by region and include on-board diagnostics (OBD) technology. The program, named PA OBD II, has been implemented in the Pittsburgh Region, including Allegheny County. The program consists of the OBD II program, along with tailpipe tests (idle in this region) and gas cap tests.

b. Fuel Assumptions

The MOVES2010a default fuel formulation and fuel supply data was reviewed and updated based on available local volumetric fuel property information provided by PA DEP. The gasohol market penetration and RVP values was also updated, with MOVES2010a default data used for the remaining parameters. Updated assumptions included:

- 0.00 percent ethanol (for summer RVP months)
- 6.78 percent ethanol (for winter months)
- 7.8 RVP during summer months

Meteorology Data

Updated weather information was obtained from WeatherBank, Inc. (www.weatherbank.com) using the 10-year average minimum and maximum monthly temperature and relative humidity values obtained at the Pittsburgh International Airport (PIT). The MOVES2010a model requires temperature and relative humidity data for each hour of the day. EPA's data converters were used to convert minimum and maximum daily temperatures to an hourly temperature profile that could be input to MOVES2010a. These assumptions are consistent with recent inventory efforts.

Vehicle Technology/Programs

a. Federal Programs

Current federal vehicle emissions control and fuel programs are incorporated into the MOVES2010a software. These include the National Program standards covering model year vehicles through 2016. Modifications of default emission rates were required to reflect the early implementation of the National Low Emission Vehicle Program (NLEV) program in Pennsylvania. To reflect these impacts, EPA has released instructions and input files that can be used to model these impacts (EPA, 2010c). This inventory utilized the August 2010 version of the files (http://www.epa.gov/oms/models/moves/tools.htm).

b. State Programs

The Pennsylvania Clean Vehicles (PCV) Program, adopted in 1998, incorporated the California Low Emission Vehicle (CA LEV II) Program by reference, although it allowed automakers to comply with the NLEV program as an alternative to this Pennsylvania program until model year 2008. Beginning with model year 2008, "new" passenger cars and light-duty trucks with a gross vehicle weight rating (GVWR) of 8,500 pounds or less, that are sold or leased and titled in Pennsylvania, must be certified by the California Air Resources Board or be certified for sale in all 50 states. For this program, a "new" vehicle is a qualified vehicle with an odometer reading less than 7,500 miles. PA DEP and PennDOT worked with the automobile manufacturers, dealers and other interested business partners and finalized procedures for complying with these new requirements.

The impacts of this program were modeled for all analysis years beyond 2008 using the same EPA guidance and tools as downloaded for the early NLEV analysis. EPA has also provided input files that reflect the CAL LEV II program. Modifications were made to these files to reflect the 2008 start date in Pennsylvania.

Traffic Growth Assumptions

Traffic growth forecasting plays a pivotal role in estimating future year emissions for the region. There are many uncertainties affecting projections of traffic growth, including the current economic conditions, future growth in population and employment, etc. Growth rates for this emissions inventory were based on an assessment of available data sources.

All SIP mobile source highway inventories include the review and assessment of county-specific growth rates from a PennDOT study originally completed in 2005 and documented in the report, *Statistical Evaluation of Projected Traffic Growth, Traffic Growth Forecasting System: Final Report, March 14, 2005* (Baker, 2005). As part of that study, a statewide traffic growth forecasting system was developed that incorporates traffic data from PennDOT's Traffic Information System and socioeconomic forecasts. That forecasting system is maintained by the PennDOT BPR and is updated on a periodic basis. This system was last updated in December of 2009 to develop new statistical relationships between historic VMT growth and population (through 2008). The forecast population was estimated from the Woods and Poole data "2010 State Profile." The results of the study have been shared between PennDOT, PA DEP, and other Pennsylvania Transportation Air Quality Working Group members.

The growth rates from the PennDOT BPR forecasting system were evaluated against other available data including the SPC travel model. For the development of motor vehicle emissions budgets (MVEBs), upper estimates of the VMT growth range are used for the forecast analyses. From an air quality perspective, the use of the upper boundary is conservative, and provides for factors outside the agency's control (e.g., potential socio-economic growth above current forecasts, fleet age distributions, vehicle type distribution) that influence motor vehicle emissions.

For the Liberty-Clairton $PM_{2.5}$ NAA, the PennDOT BPR Growth Rate forecasting system was used to convert 2008 volumes to 2007, while growth rates from 2007-2014 are based on the SPC regional travel demand model. Of the multiple sources reviewed, these yielded the highest estimates of traffic volumes and, in turn, the highest estimate of the onroad emissions. Base and forecasted VMT estimates are shown in Table 2-3.

Table 2-3. Base and Forecasted Vehicle Miles of Travel (Millions)

VMT (Millions)*		%
2007	**2014**	**Change**
94.701	107.171	13.2%

* All VMT is classified as Urban, Unrestricted in MOVES for Liberty-Clairton.

Vehicle Population Growth Assumption

Vehicle population growth forecasting plays a key role in determining emissions for future years for the region. For this inventory, the vehicle population was forecasted by considering county-specific household and population growth. Liberty-Clairton area vehicle population estimates by MOVES source types are shown in Table 2-4.

The household and population data was obtained from the PennDOT study documented in the reports discussed above, as well as the *Statistical Evaluation of Projected Traffic Growth, Traffic Growth Forecasting System: Final Report, March 14, 2005*. The forecast household and population were estimated from the Woods and Poole data "2010 State Profile." The highest growth for household and population data was obtained for the county. The household growth rate yielded the higher value and did not exceed VMT growth. This value was ultimately used to project the 2007 vehicle population to 2014.

Table 2-4. Vehicle Population Estimated Classified by MOVES Source Type

MOVES Source Type ID	Vehicle Population	
	2007	2014
11	443	488
21	6,572	6,626
31	4,625	4,749
32	1,545	1,586
41	2	3
42	14	14
43	20	21
51	1	2
52	94	105
53	11	13
54	21	24
61	23	25
62	26	29
Total	**13,397**	**13,685**

Final Results

Table 2-5 summarizes the 2007 and 2014 onroad vehicle estimates for the Liberty-Clairton NAA by MOVES road type.

Table 2-5. Liberty-Clairton $PM_{2.5}$ NAA Onroad Emissions Summary by Road Type (Tons/Year)

	2007						
Road Type	**Annual VMT (millions)**	**Speed (miles/hour)**	**$PM_{2.5}$**	**VOC**	**NO_x**	**SO_2**	**NH_3**
Off-Road	-	-	1.82	121.60	75.43	0.16	0.00
Urban Unrestricted	94.701	29.1	8.09	50.92	198.86	1.99	4.66
Area Total	**94.701**	**-**	**9.91**	**172.52**	**274.29**	**2.15**	**4.66**
	2014						
Road Type	**Annual VMT (millions)**	**Speed (miles/hour)**	**$PM_{2.5}$**	**VOC**	**NO_x**	**SO_2**	**NH_3**
Off-Road	-	-	1.16	72.74	51.72	0.07	0.00
Urban Unrestricted	107.171	29.1	5.02	22.32	99.31	0.84	3.36
Area Total	**107.171**	**-**	**6.18**	**95.06**	**151.03**	**0.90**	**3.36**

Table 2-6 provides an onroad emissions summary by fuel type for the Liberty-Clairton NAA, as well as the expected change in VMT and emissions between 2007 and 2014.

Table 2-6. Liberty-Clairton $PM_{2.5}$ NAA Onroad Emissions Summary by Fuel Type* (Tons/Year)

	2007						
Fuel Type	**Annual VMT (millions)**	**Speed (miles/hour)**	**$PM_{2.5}$**	**VOC**	**NO_x**	**SO_2**	**NH_3**
Gasoline	88.717	29.1	4.17	164.42	175.63	1.80	4.51
Diesel Fuel	5.985	29.1	5.74	8.10	98.66	0.35	0.15
Area Total	***94.701***	***29.1***	***9.91***	***172.52***	***274.29***	***2.15***	***4.66***
	2014						
Fuel Type	**Annual VMT (millions)**	**Speed (miles/hour)**	**$PM_{2.5}$**	**VOC**	**NO_x**	**SO_2**	**NH_3**
Gasoline	100.203	29.1	3.34	89.91	93.23	0.81	3.18
Diesel Fuel	6.968	29.1	2.84	5.15	57.80	0.09	0.18
Area Total	***107.171***	***29.1***	***6.18***	***95.06***	***151.03***	***0.90***	***3.36***
	Change in VMT and Total Emissions: 2007-2014						
Fuel Type	**Annual VMT (millions)**	**Speed (miles/hour)**	**$PM_{2.5}$**	**VOC**	**NO_x**	**SO_2**	**NH_3**
Gasoline	11.486	-	-0.83	-74.51	-82.39	-0.99	-1.33
Diesel Fuel	0.983	-	-2.89	-2.95	-40.86	-0.26	0.02
Area Total	***12.469***	***-***	***-3.73***	***-77.46***	***-123.26***	***-1.24***	***-1.31***

The speed given in Tables 2-5 and 2-6 is calculated by the internal processes within the PPSUITE software. PPSUITE uses a combination of "Best Practices Methods (BPM) speed curves" similar to those typically found in regional travel demand models, along with adjustments as found in the TRB Highway Capacity Manual to account for roadway geometry. This approach is based on common industry practice and is consistent with the approach used in other regional air quality planning analyses.

All input data was at a minimum coded to the first decimal place. PPSUITE internally uses floating point calculations which retain accuracy to 16 decimal places. While the table reports average vehicle speed to the first decimal place, that model-estimated value is more precise than the model's ability to estimate such speeds.

2.4 Insignificance Finding Factor 1: Motor Vehicle Emissions Constitute a Low Percentage of Total SIP Inventory

As specified by EPA guidance, pollutants inventoried as part of the June 21, 2013 SIP submittal for the Liberty-Clairton $PM_{2.5}$ nonattainment area included PM_{10} and $PM_{2.5}$ along with precursors SO_2, NO_x, VOC, and NH_3. The emissions inventory included in the plan was compiled for sources within the nonattainment area (City of Clairton, Glassport Borough, Liberty Borough, Lincoln Borough, Port Vue Borough). Sources in the emissions inventory include stationary point sources, area sources, nonroad sources, and onroad sources.

In the June 21, 2013 SIP submittal, year 2007 was used for baseline emissions inventory and year 2014 was used for the projected inventory. The 2007 inventory provided actual emissions of a year when the Liberty-Clairton area was not attaining either the 1997 or the 2006 $PM_{2.5}$ standards, and the SIP submittal showed projected attainment of the 2006 $PM_{2.5}$ NAAQS by 2014. The Liberty-Clairton area attained the 1997 $PM_{2.5}$ NAAQS in 2011 and is currently attaining these standards. The SIP submittal included additional controls that will be implemented by 2014 to attain the 24-hour 2006 $PM_{2.5}$ NAAQS and will also result in further reductions of annual $PM_{2.5}$ concentrations. Therefore, these inventories are consistent with attainment of both the 1997 and 2006 $PM_{2.5}$ NAAQS.

Emissions inventories for all source classifications were developed for the Mid-Atlantic / Northeast Visibility Union (MANE-VU) for use in regional analyses and SIPs by states in the Northeastern region of the United States. As described in the June 21, 2013 SIP submittal, the Liberty-Clairton emissions inventory was developed from the regional MANE-VU inventories with revisions by TranSystems|E.H. Pechan (TS|Pechan) for area, nonroad, and mobile sources and by ACHD for stationary point sources. Emissions given are "actual" values based on pollutant emission factors and throughputs or capacities of each emission source. Emissions do not represent permitted or "allowable" limits.

Source categories used for the emissions inventory are described below. The inventory listings are included in Appendix D of the June 21, 2013 SIP submittal, and information on the development of the baseline and projected emissions and modeling inventories are given in Appendices E and F of that same submittal.

- Stationary point sources are sources for which ACHD collects individual emissions-related information.
- Area sources are industrial, commercial, and residential sources too small or too numerous to be handled individually. These include but are not limited to commercial and residential open burning, architectural and industrial maintenance coatings application and clean-up, consumer product use, and vehicle refueling at service stations.
- Nonroad sources encompass a diverse collection of engines, including but not limited to outdoor power equipment, recreational vehicles, farm and construction machinery, lawn and garden equipment, industrial equipment, recreational marine vessels, commercial marine vessels, locomotives, ships, and aircraft.

- Onroad sources include passenger cars and light-duty trucks, medium and heavy duty trucks, buses and motorcycles. The Motor Vehicle Emissions Simulator (MOVES) model was utilized to generate emissions based on traffic counts, vehicle speeds, vehicle population growth, and other factors. Mobile source emissions for the Liberty-Clairton area were developed by TS|Pechan.

Emissions inventory summaries of $PM_{2.5}$ and NO_x for baseline and future projected cases are shown in Tables 2-7 and 2-8 below.[5] These emissions represent those from sources only within the 5-municipality Liberty-Clairton area and not the surrounding area.

Table 2-7. Baseline 2007 Emissions (Tons/Year)

Liberty-Clairton Area (2007)	**$PM_{2.5}$**	**NO_x**
Stationary Point Sources	946.6	4841.9
Area Sources	26.3	38.8
Nonroad Sources	15.0	437.9
Onroad Sources	9.9	274.3
Totals	997.8	5592.9
Onroad Percentages	**0.99%**	**4.90%**

Table 2-8. Future Projected 2014 Emissions (Tons/Year)

Liberty-Clairton Area (2014)	**$PM_{2.5}$**	**NO_x**
Stationary Point Sources	662.7	4349.3
Area Sources	25.6	38.5
Nonroad Sources	12.4	387.1
Onroad Sources	6.2	151.0
Totals	706.8	4925.9
Onroad Percentages	**0.88%**	**3.07%**

[5] Emissions of SO_2, VOC, and NH_3.are not shown since onroad budgets for these precursors are only required if it is determined that budgets are necessary in order for the SIP to achieve its purpose of achieving reasonable further progress, attainment, or provide for maintenance of the given NAAQS. The June 21, 2013 SIP submittal does not rely on reductions of VOC or NH_3 from any sources in the area in order to demonstrate attainment. The SIP submittal does rely on SO_2 emissions reductions from point sources; however, it does not rely on reductions from onroad SO_2 sources, which represented less than 0.2% of the total SO_2 inventory for the area.

Based on the emissions inventories in Tables 2-7 and 2-8, it can be concluded that:

- Onroad mobile source $PM_{2.5}$ constitutes less than one percent (1%) of the area's total 2007 $PM_{2.5}$ emissions and the area's total projected 2014 $PM_{2.5}$ emissions.
- Onroad mobile source NO_x constitutes less than five percent (5%) of the area's total NO_x emissions in 2007 and less than four percent (4%) of the area's total projected 2014 NO_x emissions.

Therefore, with regard to the first factor to be considered by this SIP submittal for determining an insignificance finding, ACHD asserts that the low mobile source contribution of direct $PM_{2.5}$ and NO_x, in concert with their continuing decline, both in absolute emissions and relative to other source categories (as documented in Tables 2-7 and 2-8), warrants an insignificance finding for both the 1997 annual and 2006 24-hour $PM_{2.5}$ standards.[6]

[6] This conclusion would be consistent with EPA's past actions on requests to find direct $PM_{2.5}$ and NO_x emissions to be insignificant for transportation conformity purposes. Generally, EPA has proposed to approve insignificance findings if onroad NO_x emissions are less than 10% of an area's inventory and onroad direct $PM_{2.5}$ emissions are less than 3% of an area's total direct $PM_{2.5}$ emissions inventory. (Percentage guidelines as provided by EPA's Office of Transportation and Air Quality.)

2.5 Insignificance Finding Factor 2: Current State of Air Quality as Determined by Monitoring Data for $PM_{2.5}$ in the Liberty-Clairton Area

$PM_{2.5}$ monitors are currently located at eight different monitoring locations throughout Allegheny County. Two Federal Reference Method (FRM) $PM_{2.5}$ monitors are located in the Liberty-Clairton area. The FRM monitor at Liberty is located atop a school at high elevation near the center of the Liberty-Clairton area. The FRM monitor at Clairton is located atop a school at low elevation in the western portion of the area. Appendix B of the June 21, 2013 SIP submittal contains detailed monitored data and EPA Air Quality System (AQS) reports.

Currently, monitoring data shows that the Liberty-Clairton area is attaining the 1997 annual $PM_{2.5}$ standard. EPA has made two determinations of attainment for the 1997 $PM_{2.5}$ standard for the Liberty-Clairton area:[7]

1. The area has attained the 1997 NAAQS by its attainment date, based on 2009-2011 monitoring data.

2. Second, the area has continued to attain the 1997 NAAQS, based on 2010-2012 monitoring data.

The Liberty-Clairton area is currently not attaining the 24-hour 2006 NAAQS. However, the June 21, 2013 attainment demonstration addressed regional and local controls needed to bring the area into attainment for the 2006 NAAQS by 2014. Since the nonattainment problem of $PM_{2.5}$ is primarily stationary source-based, the controls for Liberty-Clairton corresponded to stationary source controls.

All Allegheny County FRM[8] $PM_{2.5}$ annual and 24-hour design values (3-year averages of annual and 24-hour 98th-percentiles, respectively) for the timeframe 2000-2012 are shown in Figures 2-1 and 2-2.[9]

[7] Final rule published in the FR on October 25, 2013, with an effective date of November 25, 2013.

[8] Initial Avalon monitored data for the period Jan. 2010 – May 2011was Federal Equivalent Method (FEM) before switching to FRM in June 2011.

[9] Figures 2-1 and 2-2 include some 3-year periods with low recovery quarters (i.e., less than 75% valid data per quarter) as noted in Appendix B of the June 21, 2013 SIP submittal in regard to design values through 2011. Additionally, in 2012, one calendar quarter was below 75% data recovery for North Braddock. The technical support document for the determination of attainment for Liberty-Clairton for the 1997 $PM_{2.5}$ NAAQS further addresses data completeness for the Liberty and Clairton monitors for 2010-2012.

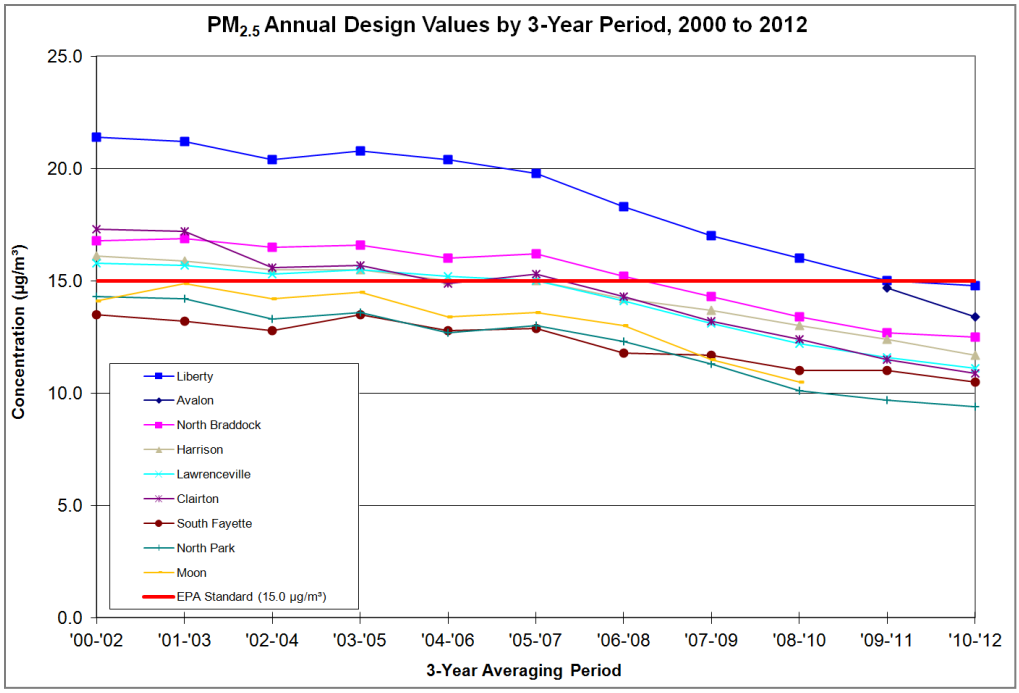

Figure 2-1. $PM_{2.5}$ FRM Annual Design Values, Allegheny County, 2000-2012

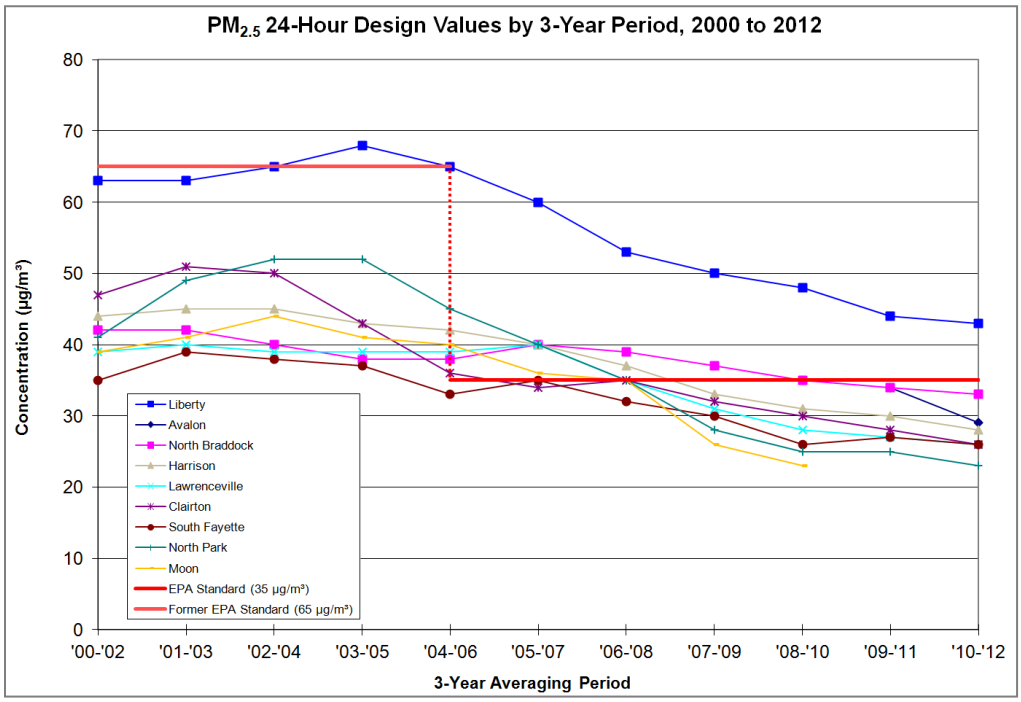

Figure 2-2. $PM_{2.5}$ FRM 24-Hour Design Values, Allegheny County, 2000-2012

Figures 2-1 and 2-2 show that all Allegheny County sites have shown decreasing design values for both annual and 24-hour $PM_{2.5}$ NAAQS since 2000, with only the Liberty monitor showing a 24-hour design value above the NAAQS for the 2010-2012 period.

Figures 2-3 and 2-4 show annual and 24-hour design values for the Liberty and Clairton monitors over a 10-year timeframe from 2005 to the projected year 2014 (projected design values were taken from the attainment tests in the June 21, 2013 SIP submittal).

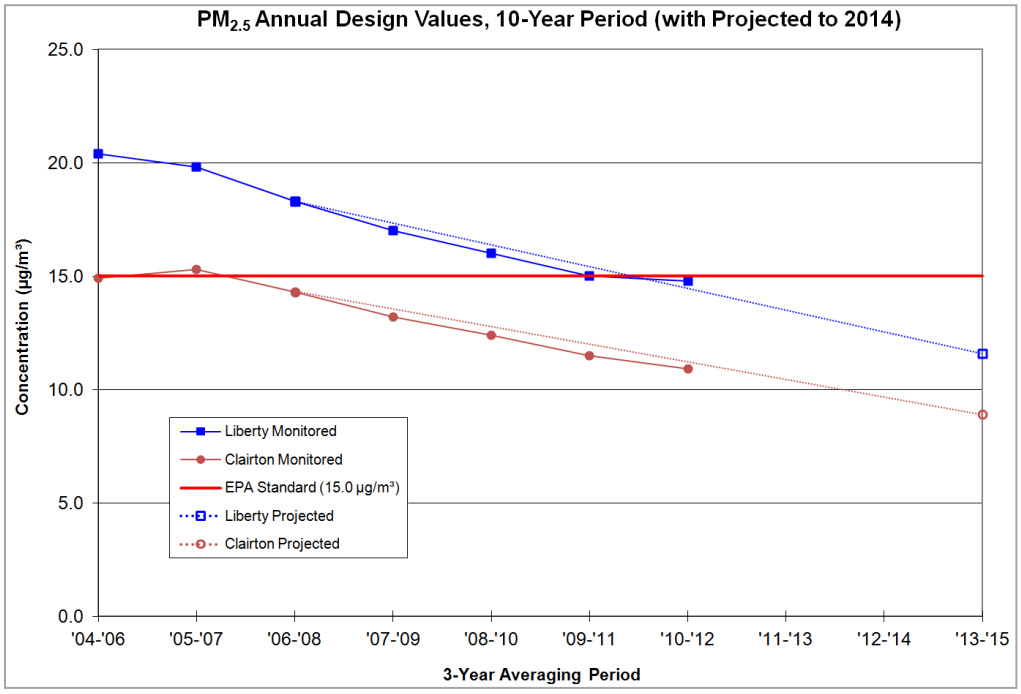

Figure 2-3. Liberty and Clairton FRM Annual Design Values with Projected to 2014

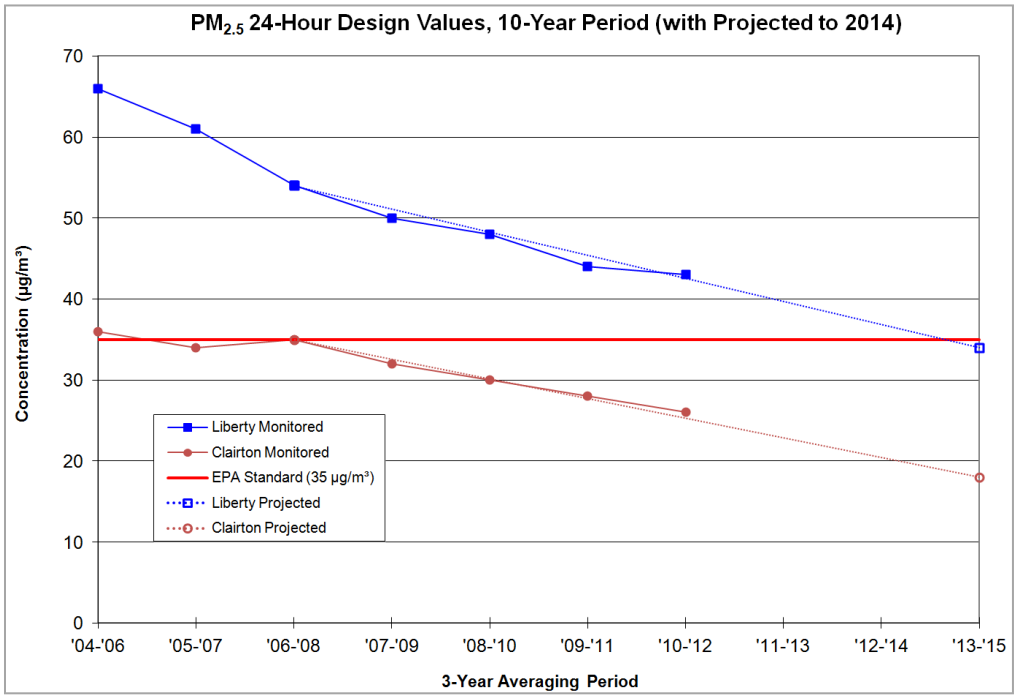

Figure 2-4. Liberty and Clairton FRM 24-Hour Design Values with Projected to 2014

The attainment demonstration showed that the Liberty-Clairton area will continue to attain the 1997 $PM_{2.5}$ NAAQS based on decreasing annual design values and will attain the 2006 $PM_{2.5}$ NAAQS by 2014 based on projected 24-hour design values. Figures 2-3 and 2-4 show that the decreasing trends in the modeled projections are similar and consistent with the actual monitored data, indicating that the projections are adequate to represent expected air quality monitoring data after the implementation of control measures. (For the projections, averaging periods 2006-2008 and 2013-2015 were used to represent the weighted 2007 baseline and 2014 future projected design values, respectively.)

Therefore, with regard to the second factor to be considered by this SIP submittal for determining the acceptability of an insignificance finding, ACHD asserts that attainment of the 1997 annual $PM_{2.5}$ NAAQS beginning in 2011 and the continuing monitored and modeled downward trends in concentrations support an insignificance finding for that NAAQS. With regard to the 2006 24-hour $PM_{2.5}$ NAAQS, the continuing downward trends in monitored concentrations and the projected attainment of the NAAQS in 2014 based on control measures in the June 21, 2013 SIP submittal support an insignificance finding for the 2006 24-hour $PM_{2.5}$ NAAQS.

2.6 Insignificance Finding Factor 3: Absence of SIP Motor Vehicle Control Measures

2.6.1 Transportation Control Measures

Historically, there have been no Allegheny County SIP requirements for Transportation Control Measures (TCMs). TCMs are strategies that reduce transportation-related air pollution, greenhouse gas (GHG) emissions, and fuel use by reducing vehicle miles traveled and improving roadway operations.

Vehicle use can be reduced through less-polluting transportation alternatives, such as public transit, and strategies that decrease the need for vehicle trips, such as telecommuting. TCMs may also focus on making travel more efficient by carefully managing the transportation system.

2.6.2 Current Control Requirements

Onroad vehicles are subject to federal emission standards. In addition, a vehicle inspection and maintenance program is in place in the area, as well as vehicle idling restrictions, and low vapor pressure gasoline requirements during the ozone season. These controls were either required or selected for implementation in order to reduce emissions and to bring the larger Pittsburgh MSA into attainment of the ozone NAAQS.

2.6.3 Review of RACM

TranSystems|E.H. Pechan (TS|Pechan), along with KB Environmental Sciences, Inc., examined several RACM options for onroad mobile sources in the Liberty Clairton area, as shown in Table 2-9 below for highway sources. Additional details of the RACM analysis can be found in Appendix I of the June 21, 2013 SIP submittal.

Table 2-9. Onroad Highway Mobile Sources RACM Analysis Summary

	RACM Options	Potential 2014 $PM_{2.5}$ Emission Reduction (annual tons)	$/PM_{2.5}$ Ton
1.	Onroad diesel engine retrofits for school buses, trucks, and transit buses using EPA-verified technologies.	1.46	$25,000-75,000
2.	Diesel idling programs for trucks.	0.04	750,000
3.	Transportation control measures, as well as other transportation demand management and transportation systems management strategies.	0.01	8×10^6
4.	Programs to reduce emissions or accelerate retirement of high emitting vehicles.	0.03	1.24×10^6
5.	Emission testing and repair/maintenance programs for onroad vehicles.	Not estimated	-
6.	Programs to expand use of clean burning fuels.	0.44	-
7.	Low emissions specification for public or private vehicle fleets.	0.09	-
8.	Opacity or other emission standards for gross emitting diesel equipment.	Not estimated	-

The TS|Pechan RACM analysis for the Liberty-Clairton area included consideration of the establishment of an Employer Rideshare Program as a SIP Motor Vehicle Control Measure. It would provide incentives or encouragement for employers to offer a carpool/ridesharing program to employees. Control efficiencies for a commuter benefit program involve a reduction in the total vehicle miles traveled (VMT) by individuals participating in the program. The annualized cost-effectiveness of the proposed program is $8,542,879 per ton of $PM_{2.5}$.

EPA interprets RACM as a collection of measures that, taken as a group, advance the NAAQS attainment date by at least one year. In this instance, the finding of the analysis performed as part of the June 21, 2013 SIP submittal was that the set of RACMs that have been identified for the Liberty-Clairton $PM_{2.5}$ NAA are not likely to advance the attainment date by one year or more. Consequently, none, including the TCM, will be implemented.

Therefore, with regard to the third factor to be considered by this SIP submittal for determining an insignificance finding, ACHD asserts that the absence of new motor vehicle control measures in the June 21, 2013 SIP submittal warrants an insignificance finding for both the 1997 and 2006 $PM_{2.5}$ NAAQS.

2.7 Insignificance Finding Factor 4: Historical Trends and Future Projections of the Growth of Motor Vehicle Emissions

Allegheny County is unique in the fact that the population has been declining since the 1960s. Localized regions of population growth are occurring, but the general trend for the county is one of negative growth. The 2010 census shows continued decrease in population in the five municipalities of the Liberty-Clairton area as well. According to the U.S. Census Bureau, from 2000 to 2010, the City of Clairton had a decrease in population of about 20%, the largest population decrease in the nonattainment area. (See Figure 2-5 below.)

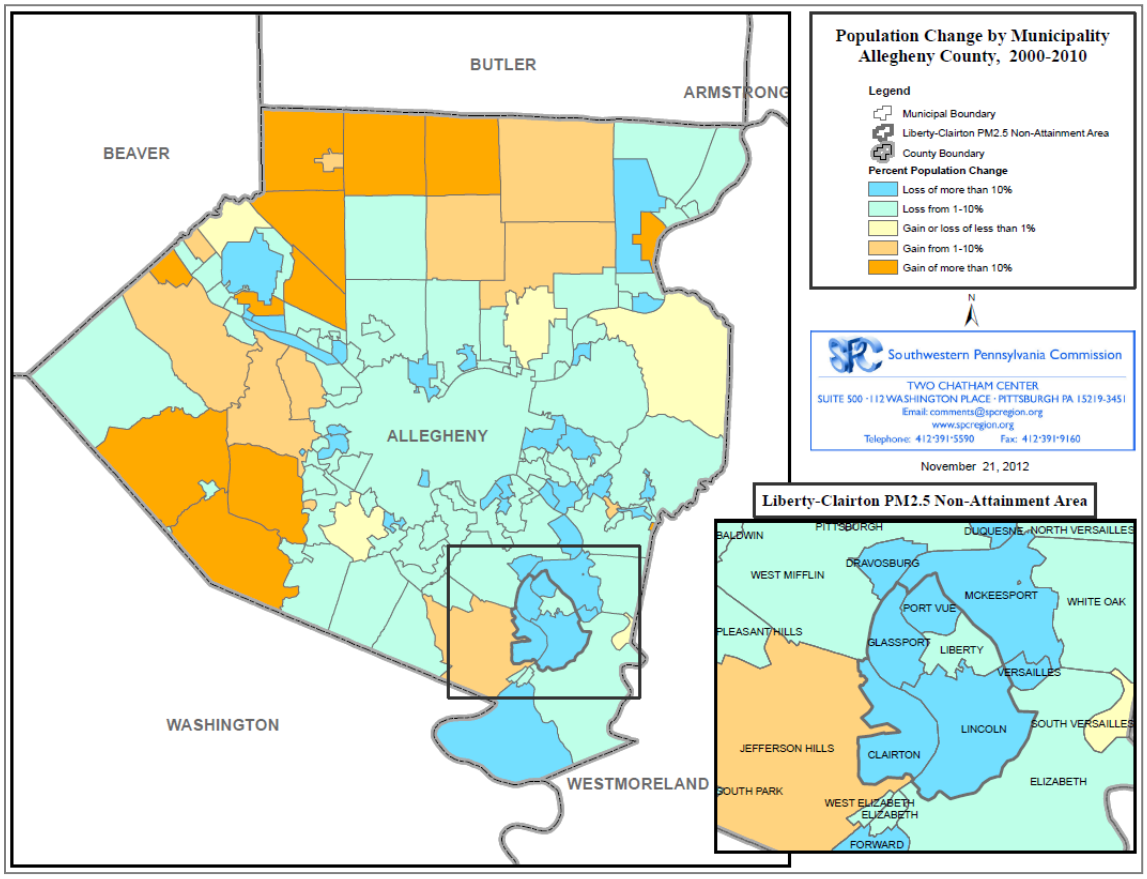

Figure 2-5. Population Trends for Allegheny County, 2000-2010

Population decreases were also seen in the remaining nonattainment area boroughs. Glassport saw a population change of -10.2%, Liberty -4.5%, Lincoln -12.0%, and Port Vue -10.2%. In total, the five nonattainment area municipalities decreased in population by 2,900 people, or -13.4% from 2000 to 2010. This continues a trend of decline from the 1990-2000 period, which saw an average change in population of -6.6% in the nonattainment area. Decreasing populations signal less use of cars and a lesser need for school buses and other diesel-engine vehicles.

Section 2.3.4 above corroborates the expected slow growth in vehicle population. Table 2-4 indicates an increase of only 288 vehicles between the years 2007 and 2014. Also, as discussed

in Section 2.4 above, the attainment demonstration projects that both annual and 24-hour onroad emissions of direct $PM_{2.5}$ and NO_x will decrease from the 2007 base year through 2014.

While not a part of the June 21, 2013 SIP submittal, the most recent Southwestern Planning Commission (SPC) air quality conformity determination for the Pittsburgh transportation management area[10] shows similar trends for VMT and onroad emissions. The SPC conformity determination projected a slow growth in VMT in the area through 2040 and a downward trend in onroad emissions of direct $PM_{2.5}$ and NO_x throughout the assessment period.

Therefore, with regard to the fourth factor to be considered by this SIP submittal for determining the acceptability of an insignificance finding, ACHD asserts that available data does not indicate highway motor vehicle emissions growth that would lead to a violation of the 1997 or 2006 $PM_{2.5}$ NAAQS, and thus warrants an insignificance finding for both the 1997 and 2006 $PM_{2.5}$ NAAQS.

[10] SPC Air Quality Conformity Determination, July 2012: http://www.spcregion.org/trans_airreport.shtml

2.8 Motor Vehicle Emissions Insignificance Findings Conclusions

For the reasons set forth in Sections 2.4 through 2.7 of this document, ACHD concludes that Liberty Clairton area onroad emissions of $PM_{2.5}$ and NO_x are insignificant contributors to the nonattainment of the 1997 and 2006 $PM_{2.5}$ NAAQS for the Liberty-Clairton area.

Upon a positive adequacy review and approval of the information included in this SIP submittal for transportation conformity, no highway emissions analysis will be required for direct $PM_{2.5}$ or NO_x. $PM_{2.5}$ hot-spot analyses would continue to apply for required projects under 40 CFR 93.116 and 93.123(b) of the transportation conformity rule.

The Liberty-Clairton area is also subject to transportation conformity requirements for the 8-hour ozone standard, with SIP-approved MVEBs for NO_x and VOC. Highway analysis of seasonal ozone precursors would continue to be mandatory.

3 Projected Electric Generating Unit Emissions

This section updates and revises the projected electric generating unit (EGU) emissions analysis previously given in the June 21, 2013 SIP submittal, specifically the information provided in Section 5.3.5 and Appendix E-6.

As specified in the June 21, 2013 SIP submittal, the Cross-State Air Pollution Rule (CSAPR)[11] future case 2014 inventory was used for projected EGU emissions in the modeling demonstration. The Clean Air Interstate Rule (CAIR)[12] future case 2015 inventory, developed in 2005, is an outdated inventory that may not adequately represent expected EGU emissions. The CSAPR future case 2014 inventory, developed in 2011, was therefore used as the more recent and realistic dataset for expected EGU emissions. (At the time of this supplemental SIP revision, CSAPR was under review by the U.S. Supreme Court.)

In addition, EGU projections have changed since development of the CSAPR inventory in 2011. Several units have been modified or deactivated (or proposed for deactivation) due to compliance issues, increased natural gas production, economic factors, and/or other reasons. Reductions from these controls or deactivations were not included in the SIP modeling demonstration.

For a look at the appropriateness of the CAIR and CSAPR inventories in relation to more recent data, reported 2012 SO_2 and NO_x emissions from EPA's Clean Air Markets Division (CAMD)[13] were examined for the CSAPR-controlled states. (Note: CAIR states are similar to CSAPR but do not include MN, KS, NE, OK and include MA, CT, DE.) Current or expected reductions were also used to extrapolate the reported the 2012 data to years 2013-2015. PA and surrounding states within the PJM Interconnection Regional Transmission Organization (RTO) territory were the focus for expected reductions.

Reductions for PA and the surrounding PJM territory include current and proposed PJM deactivations[14] and state-permitted modifications. Some of the deactivations include units that are subject to federal consent decrees. Details of expected reductions within the PJM territory are given by state and unit in Appendix A, while supporting permits, deactivation requests, and consent decrees are included in Appendix B.

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[11] CSAPR information: http://www.epa.gov/airtransport/CSAPR/index.html
2014 CSAPR TR1 Remedy files: ftp://ftp.epa.gov/EmisInventory/2005v4_2/2014emis

[12] CAIR information: http://www.epa.gov/airmarkets/progsregs/cair/index.html
2015 Final CAIR Modeling: http://www.epa.gov/airmarkets/progsregs/epa-ipm/cair/index.html

[13] CAMD database: http://ampd.epa.gov/ampd/ (accessed 8/21/2013)

[14] PJM Interconnection: http://www.pjm.com/planning/generation-deactivation/gd-summaries.aspx (accessed 9/12/2013). Note that a deactivation is proposed until actual deactivation date and does not constitute permanent retirement of a unit without further analysis. The deactivation process is explained in more detail in PJM Manual 14D: http://www.pjm.com/~/media/documents/manuals/m14d.ashx

Maps of CSAPR states and the PJM Interconnection territory are shown in Figures 3-1- and 3-2 below. Appendix C contains back-trajectory data indicating the possible influence of upwind and surrounding states on pollution in SWPA.

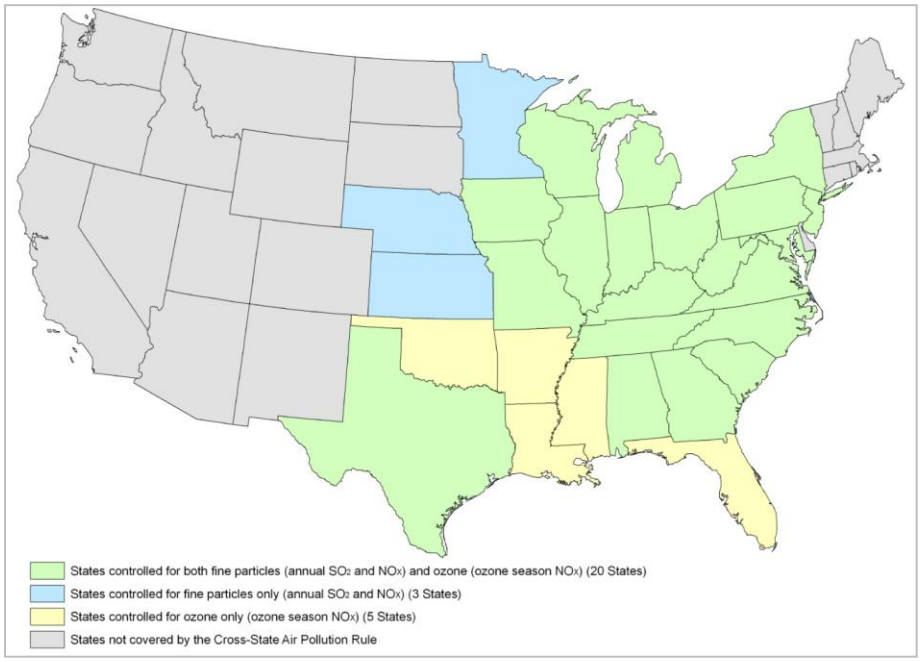

Figure 3-1. CSAPR States

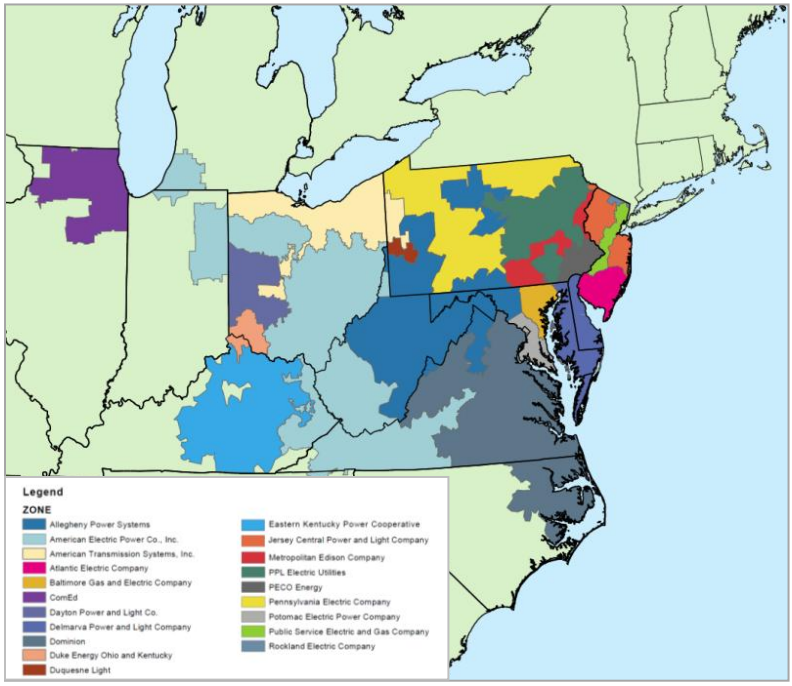

Figure 3-2. PJM Interconnection Territory

Table 3-1 below shows a summary of the actual/expected unit deactivations by plant capacity (in MW) for 2012-2015 in the PJM territory. These plants were included in the SIP modeling demonstration with CSAPR-allocated emissions levels for 2014. Emissions reductions per year from these deactivations are given in Appendix A; deactivation worksheets from the PJM web site are given in Appendix B-2.

Table 3-1. PJM Unit Deactivations by Plant Capacity, 2012-2015

Plant	Year	State	Decrease in Capacity (MW)
Albright	2012	WV	283
Armstrong	2012	PA	343
Bay Shore	2012	OH	495
Conesville	2012	OH	165
Crawford	2012	IL	532
Eastlake (2 units)	2012	OH	837
Elrama	2012	PA	460
Fisk	2012	IL	326
Kearny (2 units)	2012	NJ	250
Niles	2012	OH	217
Phil Sporn (1 unit)	2012	WV	440
Potomac River	2012	VA	482
R. Paul Smith	2012	MD	115
Rivesville	2012	WV	121
State Line	2012	IN	515
W C Beckjord (1 unit)	2012	OH	94
Willow Island	2012	WV	189
Hatfield's Ferry	2013	PA	1590
Mitchell	2013	PA	359
O H Hutchings (1 unit)	2013	OH	62
Piney Creek	2013	PA	31
Schuylkill	2013	PA	166
Titus	2013	PA	243
W C Beckjord (2 units)	2013	OH	222
B L England	2014	NJ	129
Chesapeake	2014	VA	576
Portland	2014	PA	401
Riverside	2014	MD	118
Yorktown	2014	VA	324
Ashtabula	2015	OH	244
Bergen	2015	NJ	21
Burlington	2015	NJ	205
Clinch River	2015	VA	230
Eastlake (3 units)	2015	OH	396
Edison	2015	NJ	504
Essex	2015	NJ	490
Gilbert	2015	NJ	188
Glen Lyn	2015	VA	235
Kammer	2015	WV	600
Kanawha River	2015	WV	400
Kearny (1 unit)	2015	NJ	21
Lake Shore	2015	OH	245
Mercer	2015	NJ	115
Missouri Ave	2015	NJ	60
Muskingum River	2015	OH	790
O H Hutchings (5 units)	2015	OH	277
Phil Sporn (5 units)	2015	WV	580
Picway	2015	OH	95
Sewaren	2015	NJ	564
Shawville	2015	PA	597
Tanners Creek	2015	IN	488
W C Beckjord (3 units)	2015	OH	802
Werner	2015	NJ	212

Table 3-2 below shows CAMD reported 2012 emissions for SO_2 and NO_x for CSAPR states along with extrapolated emissions for 2013-2015 based on expected controls and deactivations in the PJM territory. Projected emissions for future case 2014 CSAPR and 2015 CAIR are shown for comparison.

Table 3-2. CAMD Reported 2012 SO_2 and NO_x Emissions (with Expected Reductions in PJM Territory for 2013-2015) and Interstate Transport Rules Projected Emissions, CSAPR States

CAMD Reported with Expected Reductions in PJM Territory (CSAPR States)	2012 Reported (tons)	2013 Expected (tons)	2014 Expected (tons)	2015 Expected (tons)
Reported (or Expected) SO_2	3033582	2965809	2947442	2746660
Reported (or Expected) NO_x	1350962	1332804	1311874	1291816

Interstate Transport Rules (CSAPR States)	2014 CSAPR (tons)	2015 CAIR (tons)
Projected SO_2	2919042	4618909
Projected NO_x	1428480	1561493

Table 3-2 shows that recent reported emissions for 2012 are already well below 2015 CAIR levels for both SO_2 and NO_x, suggesting that the CAIR projections as developed in 2005 may be inaccurate. Additionally, 2012 NO_x emissions are already below the 2014 CSAPR projected level.

Expected reductions through 2014 from the PJM territory alone (without additional reductions in other states) show that SO_2 is within 1% of the 2014 CSAPR projection. Expected reductions through 2015 continue to decrease to below the 2014 CSAPR projection for SO_2.

These reductions are also shown visually on the following page in Figures 3-3 and 3-4, using long-term trends for CAMD SO_2 and NO_x emissions over the timeframe 2007-2015. Year 2007 was used as the baseline year for the modeling demonstration with 2014 as the future projected year. Expected/projected years are shown indicated by dotted lines in the figures.

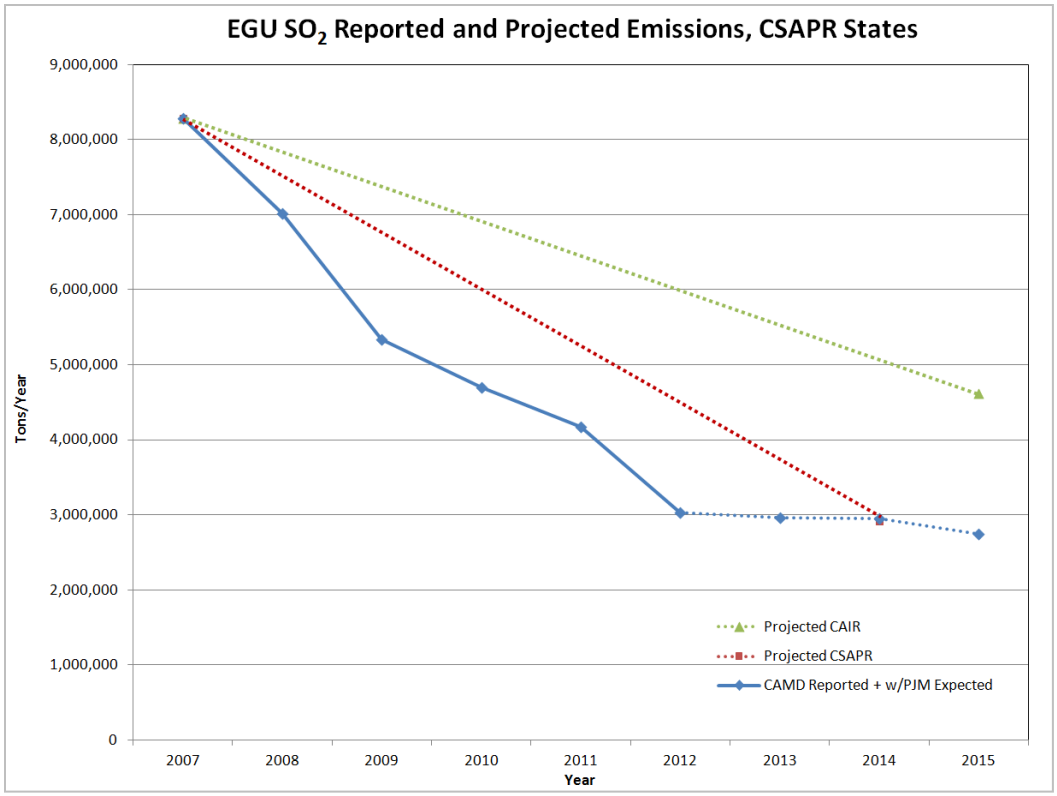

Figure 3-3. Long-Term Reported and Expected/Projected SO_2 (tons), CSAPR States

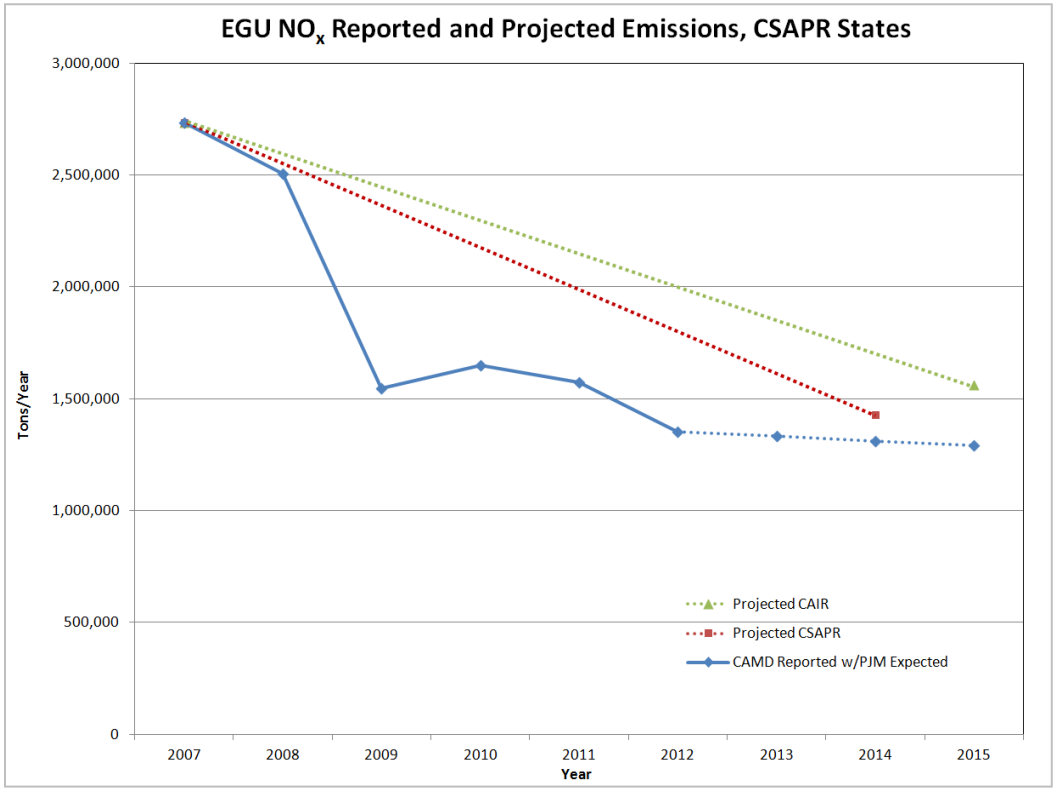

Figure 3-4. Long-Term Reported and Expected/Projected NO_x (tons), CSAPR States

The long-term trends in Figures 3-3 and 3-4 show that reported CAMD emissions of SO_2 and NO_x have decreased significantly in the U.S. in recent years. Reductions will continue through 2014 and 2015 using anticipated controls and deactivations for the PJM territory. Controls, fuel switches, and deactivations from other states have been excluded from this analysis, resulting in a potentially conservative approach for estimating future emissions.

Table 3-3 below shows a summary of the federal consent decrees and corresponding SO_2 actions and limits that are applicable to units in PJM states.

Table 3-3. Federal Consent Decrees for Units in PJM states

Company	State	Plant	Date of Consent Decree	Action Required[15]	System-Wide SO_2 Limits
American Electric Power (AEP) Corp.	Ohio/ West Virginia/ Indiana/ Kentucky/ Virginia	Amos	October 2007	Install FGD by 2011	2014: 340,000 tons/year 2019 (continuing in perpetuity): 174,000 tons/year
		Big Sandy		Install FGD by 2016 (1 unit), meet coal sulfur content limit (1 unit)	
		Cardinal		Install FGD by 2009 (2 units) and 2013 (1 unit)	
		Conesville		Install/upgrade FGD by 2011 (3 units), retire/repower/retrofit by 2013 (3 units)	
		Gavin		Install FGD by 2008	
		Glen Lyn		Meet coal sulfur content limit by 2008	
		Kanawha		Meet coal sulfur content limit by 2008	
		Mitchell		Install FGD by 2008	
		Mountaineer		Install FGD by 2008	
		Muskingum		Retire/repower/retrofit by 2016 (4 units), install FGD by 2016 (1 unit)	
		Rockport		Install FGD by 2018 (1 unit) and 2020 (1 unit)	
		Sporn		Retire/repower/retrofit by 2014 (1 unit)	
		Tanners Creek		Meet coal sulfur content limit by 2008	
		Various (for total of 600 MW)		Retire/repower/retrofit by 2019 (for 600 MW reduction from 13 units)	
American Municipal Power	Ohio	Gorsuch	May 2010	Retire by 2013	n/a
Dominion Energy	Illinois/ Indiana	State Line	April 2013	Retire (2 units) by mid-2012, retire (2 units) by mid-2013	2014: 8,500 tons/year

[15] FGD is Flue Gas Desulfurization; DSI is Dry Sorbent Injection; ECO is Electro-Catalytic Oxidation

Company	State	Plant	Date of Consent Decree	Action Required[15]	System-Wide SO_2 Limits
		Brayton Point		Meet emission rates for existing FGD by mid-2013	
		Kincaid		Install DSI by 2014	
Duke Energy	Indiana	Gallagher	December 2009	Retire/repower by 2013 (2 units), install DSI by 2011 (2 units)	n/a
Dynegy	Illinois/ Indiana	Baldwin	March 2005	Install FGD by 2013	2013 (continuing in perpetuity): 29,000 tons/year
		Havana			
		Hennepin		Reduce SO_2 emissions by 2006	
		Vermillion			
		Wood River			
East Kentucky Power Cooperative	Kentucky	Cooper	July 2007	Retire by 2013, repower by 2014, or install FGD by mid-2018	2013: 28,000 tons/year
		Dale			
		Spurlock		Install FGD by 2009 (1 unit) and 2011 (1 unit)	
Hoosier Energy Rural Electric Cooperative	Indiana	Merom	July 2010	Upgrade FGD by mid-2012 (1 unit) and mid-2013 (1 unit)	2014: 26,000 tons/year
		Ratts		Retire/repower by 2017 or meet emission rates by 2016	
Kentucky Utilities	Kentucky	Brown	February 2009	Install FGD by 2011	2011: 2,300 tons/year
Northern Indiana Public Service Company	Indiana	Bailly	January 2011	Upgrade existing FGD by 2014	2019: 11,600 tons/year (if Michigan City unit gets FGD) or 10,200 tons/year (if Michigan City unit gets retired)
		Dean Mitchell		Retire by 2010	
		Michigan City		Retire or install FGD by 2019	
		Schahfer		Install FGD (2 units) by 2014/2016 and upgrade FGD (2 units) by 2011	
Ohio Edison/ FirstEnergy Corporation	Ohio	Burger	March 2005 and August 2009	Retire by 2011 or repower by 2013	2011: 29,900 tons/year (only for Sammis Plant)
		Sammis		Install FGD, Flash Dry Absorber, ECO, or Induct Scrubber at various units by 2011	
		Mansfield		Upgrade FGD by 2008	
PSEG Fossil Corp.	New Jersey	Hudson	January 2006	Install FGD by 2010	2010: 5,270 tons/year
		Mercer			
Tennessee Valley Authority	Kentucky	Paradise	April 2011	Upgrade FGD (2 units) by 2013 and Install Wet FGD (1 unit) by mid-2011	2019: 110,000 tons/year
		Shawnee		Install FGD, repower to renewable biomass, or retire by 2018	

Supporting EGU documentation (permits, deactivations, consent decrees) can be found in Appendix B.

Considering the comparisons to CAIR and reported/extrapolated CAMD data, the 2014 CSAPR remedy case is an adequate inventory of expected EGU emissions for modeling purposes.

4 Legal Documents

4.1 Notice of Public Hearing and Comment Period

Posted on: Nov. 15, 2013

http://classmart.post-gazette.com/pittsburgh/legals/notice-of-public-hearing-on-th/C0A801571b3351FBDCrYM1EF8924

NOTICE of Public Hearing on the Proposed Revision to the Allegheny County Portion of the Pennsylvania State Implementation Plan - Supplement to the Attainment Demonstration for the Liberty - Clairton PM2.5 Nonattainment Area 2006 Standards.

The Allegheny County Board of Health will hold a public hearing on Wednesday, December 18, 2013, at 10:00 AM, Building #7 First Floor Conference Room, Clack Health Center, 301 39th Street, Pittsburgh, PA 15201 to take testimony on the proposed revision to Allegheny County's portion of the State Implementation Plan (SIP) for particulate matter of 2.5 microns or less in diameter (PM2.5). This will be submitted to EPA for approval as a SIP revision.

This Supplemental SIP revision addresses transportation conformity by demonstrating a finding of insignificance for motor vehicle emissions for the Liberty-Clairton area with respect to the 2006 PM2.5 National Ambient Air Quality Standards (NAAQS) as well as the 1997 PM2.5 NAAQS. The Supplemental SIP revision also updates the power plant emissions analysis already included in the SIP.

Copies of the proposed SIP revision may be examined beginning Monday, November 18, 2013, at the Allegheny County Law Library, Room 921 City-County Building, Grant Street, Pittsburgh, PA 15219, from 8:30 AM to 5:00 PM; at the Allegheny County Health Department Document Control Room, Building 7, Clack Health Center, from 8:30 AM until 4:00 PM, Monday through Friday; on the Allegheny County Health Department web site: www.achd.net; or by calling 412-578-8120 to request a mailed printed copy.

Oral testimony must be pre-scheduled by calling 412-578-8008 no less than 24 hours in advance of the public hearing. Speakers will be limited to five minutes and should bring a written copy of their comments to the hearing.

The Board will accept written testimony beginning Monday, November 18, 2013, and concluding 4:00 PM on Monday, December 23, 2013, by mail to Board of Health, 3333 Forbes Avenue, Pittsburgh, PA 15213, by email to aqcomments@achd.net, or by fax to 412-578-8325.

4.2 Transmittals of Hearing Notice to PA DEP and EPA

COUNTY OF ALLEGHENY

RICH FITZGERALD
COUNTY EXECUTIVE

November 14, 2013

Ms. Joyce Epps, Director
Department of Environmental Protection
Bureau of Air Quality
Rachel Carson Building
400 Market Street, P. O. Box 8468
Harrisburg, PA 17105-8468

Dear Ms. Epps:

Enclosed is a Notice of Public Hearing for a hearing scheduled to occur on December 18, 2013, regarding a proposed Supplemental revision to Allegheny County's portion of the PA State Implementation Plan (SIP) for $PM_{2.5}$ for the Liberty-Clairton Nonattainment Area. The associated public comment period begins November 18, 2013 and ends December 23, 2013.

The Supplemental SIP revision is available for download at: http://www.achd.net/air.html. Hard copies and modeling file DVDs are available by request.

The Supplemental SIP revision is being tracked as part of our Revision Tracking Number 75. Your comments are welcome.

Sincerely,

James Thompson, Manager
Air Quality Program

cc: Kirit Dalal
Steve Hepler

Enclosure
* Public Hearing Notice

AIR QUALITY PROGRAM
301 39TH STREET – BUILDING #7
PITTSBURGH PA 15201-1891
PHONE (412) 578-8103 FAX (412) 578-8144

KAREN HACKER, MD, MPH, ACTING DIRECTOR
ALLEGHENY COUNTY HEALTH DEPARTMENT
3333 FORBES AVENUE • PITTSBURGH, PA 15213
PHONE (412) 687-ACHD (2243) • FAX (412) 578-8325 • WWW.ACHD.NET

COUNTY OF ALLEGHENY

RICH FITZGERALD
COUNTY EXECUTIVE

November 14, 2013

Diana Esher, Director
Air Protection Division
Region III (3AP00)
U. S. Environmental Protection Agency
1680 Arch Street
Philadelphia, PA 19103-2029

Dear Ms. Esher:

Enclosed is a Notice of Public Hearing for a hearing scheduled to occur on December 18, 2013, regarding a proposed Supplemental revision to Allegheny County's portion of the PA State Implementation Plan (SIP) for $PM_{2.5}$ for the Liberty-Clairton Nonattainment Area. The associated public comment period begins November 18, 2013 and ends December 23, 2013.

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Sincerely,

James Thompson, Manager
Air Quality Program

Enclosure

* Public Hearing Notice

Air Quality Program
301 39th Street, Bldg. 7
Pittsburgh, PA 15201-1891

KAREN HACKER, MD, MPH, DIRECTOR
ALLEGHENY COUNTY HEALTH DEPARTMENT
3333 FORBES AVENUE • PITTSBURGH, PA 15213
PHONE (412) 687-ACHD (2243) • FAX (412) 578-8325 • WWW.ACHD.NET

4.3 Proof of Publication and Certification of Public Hearing

No._____ Term,_____

Proof of Publication of Notice in Pittsburgh Post-Gazette

Under Act No 587, Approved May 16, 1929, PL 1784, as last amended by Act No 409 of September 29, 1951

Commonwealth of Pennsylvania, County of Allegheny, ss H. Java, being duly sworn, deposes and says that the Pittsburgh Post-Gazette, a newspaper of general circulation published in the City of Pittsburgh, County and Commonwealth aforesaid, was established in 1993 by the merging of the Pittsburgh Post-Gazette and Sun-Telegraph and The Pittsburgh Press and the Pittsburgh Post-Gazette and Sun-Telegraph was established in 1960 and the Pittsburgh Post-Gazette was established in 1927 by the merging of the Pittsburgh Gazette established in 1786 and the Pittsburgh Post, established in 1842, since which date the said Pittsburgh Post-Gazette has been regularly issued in said County and that a copy of said printed notice or publication is attached hereto exactly as the same was printed and published in the regular editions and issues of the said Pittsburgh Post-Gazette a newspaper of general circulation on the following dates, viz:

15 of November, 2013

Affiant further deposes that he/she is an agent for the PG Publishing Company, a corporation and publisher of the Pittsburgh Post-Gazette, that, as such agent, affiant is duly authorized to verify the foregoing statement under oath, that affiant is not interested in the subject matter of the afore said notice or publication, and that all allegations in the foregoing statement as to time, place and character of publication are true.

COPY OF NOTICE OR PUBLICATION

NOTICE of Public Hearing on the Proposed Revision to the Allegheny County Portion of the Pennsylvania State Implementation Plan - Supplement to the Attainment Demonstration for the Liberty - Clairton PM2.5 Nonattainment Area 2006 Standards

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H. Java

PG Publishing Company

Sworn to and subscribed before me this day of:
November 15, 2013

Linda M. Gaertner

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Linda M. Gaertner, Notary Public
City of Pittsburgh, Allegheny County
My Commission Expires Jan. 31, 2015
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

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Attorney For

Revision 75

Supplemental SIP Revision for $PM_{2.5}$ for Liberty-Clairton, 2006 NAAQS

Certification of Hearing

Jason M. Maranche deposes and says that he is an Air Pollution Control Engineer III with the Air Quality Program of the Allegheny County Health Department and hereby certifies that a Public Hearing was held on December 18, 2013 regarding the proposed revision to Allegheny County's portion of the State Implementation Plan (SIP) for particulate matter 2.5 microns or less in diameter (PM2.5); that the opportunity for written comments was given during the period November 18, 2013 through December 23, 2013 in accordance with the requirements of 40 CFR 51.102; that notice of such hearing was given by publication in a newspaper of general circulation on November 15, 2013; and to the best of his knowledge, belief and understanding, such proceedings were in full compliance with all applicable state and federal laws, regulations, and other requirements.

Jason M. Maranche
Air Pollution Control Engineer III
Air Quality Program
Allegheny County Health Department

12/18/13
Date

4.4 Summary of Public Comments and Responses

Comment and Response Document for the Proposed SIP Revision 75
Revision to State Implementation Plan for $PM_{2.5}$ for Allegheny County
Supplement to the Liberty-Clairton $PM_{2.5}$ Attainment Plan, 2006 NAAQS

December 18, 2013 Public Hearing
Public Comment Period ending December 23, 2013

EGU ANALYSIS
Comments related to the projected emissions for electric generating units (EGUs).

1. **Comment:** ACHD cannot rely on controls and emission reductions anticipated from the implementation of the Cross-State Air Pollution Rule (CSAPR). The Clean Air Act requires that an attainment demonstration contain specific, federally-enforceable measures that will attain the NAAQS. The CSAPR future case inventory for 2014 assumes emission controls and reductions associated with a vacated law that is under review by the U.S. Supreme Court; CSAPR is therefore not legally enforceable and not an appropriate inventory for representative purposes. Any emission reductions, including those represented in future case modeling demonstrations, should instead be derived from the Clean Air Interstate Rule (CAIR) pending the final decision regarding CSAPR or promulgation of another replacement rule.

   Commenter: Clean Air Council, PennFuture, Clean Water Action.

   Response: As noted in the May 10, 2013 SIP document, ACHD will rely on CAIR, state, and permit controls until a final decision is made regarding CSAPR or until a replacement rule is promulgated. However, ACHD believes that the inventory used in the CAIR modeling demonstration is an outdated inventory that does not adequately represent future emissions from the electric generating unit (EGU) sector for modeling purposes. The CSAPR future case inventory was therefore used in the modeling demonstration. ACHD maintains that, in lieu of any additional inventory, the CSAPR inventory is an updated version of the CAIR inventory that is best representative of expected EGU controls.

   The purpose of the additional analysis of projected EGU emissions in the supplemental SIP was to further clarify "real-world" emissions reductions and how they compare to CSAPR and CAIR inventories. The analysis of recent emissions, including current and expected deactivations not included in the modeling, show that reported and expected emissions for CSAPR states are comparable to the emissions included in the CSAPR 2014 modeling. EGU deactivations/retirements that are federally-enforceable have been noted in Table 3-3 and in Appendix A of the Supplemental SIP.

   Furthermore, EPA modeling guidance outlined the methodology for the use of actual emissions with the intent of predicting realistic transformation of precursor emissions to

$PM_{2.5}$ concentrations from all emissions sectors. The CAIR emissions, while representing the current enforceable emissions allocations, would not lead to realistic estimations of future $PM_{2.5}$ concentrations.

2. **Comment:** EGU emissions from CSAPR modeled in the attainment demonstration are smaller than those in the CAIR inventory. Table 3-2 of the November 2013 Supplemental SIP indicates that total 2014 CSAPR-modeled emissions for the CSAPR states are 2,919,042 tons of sulfur dioxide (SO_2) and 1,428,480 tons of nitrogen oxides (NO_x). These CSAPR emissions are substantially lower than the 2015 CAIR emissions, namely 4,618,909 tons of SO_2 and 1,561,493 tons of NO_x. Thus, SO_2 emissions from CSAPR are 37% lower than the CAIR emissions. These CSAPR SO_2 emissions are also slightly smaller than the 2014 emissions (2,947,442 tons) that have been estimated from the CAMD database. NO_x emissions from CSAPR are 9% lower than the CAIR emissions. Thus, large differences in CAIR and CSAPR emissions, especially for SO_2, raise serious questions about the validity of the SIP attainment demonstration.

   Commenter: Clean Air Council, PennFuture, Clean Water Action.

   Response: Similar to the response to comment 1, the purpose of the EGU analysis in the Supplemental SIP was to provide a quantitative comparison of real-world emissions to modeling inventory emissions. The large differences in the CAIR and CSAPR emissions support the circumvention of the CAIR inventory for the modeling demonstration. The CSAPR 2014 SO_2 inventory is within 1% of the expected CAMD 2014 SO_2 inventory, while the CAIR 2015 inventory is 68% higher than the expected CAMD 2015 SO_2 inventory.

   Additionally, reported NO_x emissions in 2012 were already lower than both 2014 CSAPR and 2015 CAIR. The expected emissions analysis also includes deactivations from PJM Interconnection states only and does not include unannounced controls, fuel switches,or deactivations, leading to a potentially conservative approach to the emissions analysis. The CSAPR inventory therefore better represents actual emissions from the power sector than CAIR.

3. **Comment:** CAIR projections (with higher EGU emissions) provide an additional safety margin for ambient standard attainment since the CAMx photochemical model is known to largely underestimate $PM_{2.5}$ concentrations and the 2014 CAMx-projected concentrations (34-35 $\mu g/m^3$) are barely below the ambient 24-hour standard of 35 $\mu g/m^3$.

   Commenter: Clean Air Council, PennFuture, Clean Water Action.

   Response: The CAMx model was sufficiently accurate for this type of demonstration, achieving model performance goals for $PM_{2.5}$ for the baseline year. Furthermore, EPA recognizes limitations in air quality models, and procedures in the EPA modeling guidance delineated the use of relative response factors (RRFs) in the attainment tests in order to minimize modeled uncertainties. Modeled results are used to scale the observed weighted

$PM_{2.5}$ species concentrations to project 2014 future year $PM_{2.5}$ concentrations. If the model underestimates for the baseline year, it also underestimates for the future projected year. Thus, modeled underestimation or overestimation bias does directly equate to projected concentrations since the modeled results are used in the relative sense.

Additionally, preliminary monitored data for 2013 indicates that attainment of the 24-hour standard may be occurring earlier than expected. Unofficial federal reference method (FRM) monitor results show that Liberty is below the 24-hour standard for 2013 (98^{th}-percentile conc. = 31.1 µg/m³). Thus, monitored data may be showing better results than as projected with the modeling, indicative of a conservative modeling effort.

4. **Comment:** SO_2 emissions from Pennsylvania EGUs in the CSAPR are lower than those in the CAIR and CAMD inventories. Appendix A of the November 2013 Supplemental SIP shows that SO_2 emissions from EGUs located in Pennsylvania are 125,545 tons for CSAPR in 2014, 150,093 tons for CAIR in 2015, and 225,612 tons for CAMD with expected reductions in 2014. Thus, the CSAPR SO_2 emissions that were modeled in the attainment demonstration are substantially lower than those from CAIR and CAMD. These EGUs are located closest to the Liberty-Clairton area and, hence, are expected to heavily influence the $PM_{2.5}$ concentrations in the area.

   Commenter: Clean Air Council, PennFuture, Clean Water Action.

   Response: The discrepancy between PA CSAPR and expected CAMD SO_2 2014 emissions is largely due to Homer City power plant emissions, where the expected emissions are 82,439 tons higher than modeled. Completion of installation of the pollution control equipment at Homer City has been extended to early 2015. While Homer City may contribute to background sulfate concentrations in Western PA, the back-trajectory analysis in Appendix C shows that the majority of the high sulfate concentrations at Liberty occur on days when transport is from the Midwest or the Ohio Valley. Additionally, local $PM_{2.5}$ impacts are highest when winds are from the southwest (upwind of the area). The Homer City plant lies 36 miles downwind (northeast) of the Liberty-Clairton area and is unlikely to contribute to the high concentrations that are causing nonattainment in the Liberty-Clairton area. The focus of the EGU analysis was reductions within the PJM territory as a whole, with the highest presumed contributions from upwind EGUs to the west and southwest.

5. **Comment:** High $PM_{2.5}$ concentrations are influenced by emissions in surrounding states. Backward trajectories in Appendix C of the November 2013 Supplemental SIP indicate that high $PM_{2.5}$ concentrations observed in 2012 are heavily influenced by emission sources located in upwind/surrounding states. These emission sources are beyond the ACHD jurisdiction and are not subjected to ACHD control. This analysis provides additional strong evidence that higher emissions in the CAIR should be used in attainment demonstration.

   Commenter: Clean Air Council, PennFuture, Clean Water Action.

Response: Similar to the response to comment 4, expected emissions from states within the PJM territory were the focus of the emissions analysis. (Note that PJM includes only portions of IN, IL, KY, and MI, so not all of the deactivations in these states have been accounted for in the analysis, leading to a conservative effort.) The reductions in these states, although outside of ACHD's jurisdiction, were based on announced PJM deactivations and federal consent decrees.

6. **Comment:** The CAMD data are biased by large reduction in electricity demand due to economic recession. Figures 3-3 and 3-4 of the November 2013 Supplemental SIP show large drops in SO_2 and NO_x emissions reported in the CAMD database between 2007 and 2012. These emission reductions are primarily due to the large reduction in power demand caused by the current economic recession starting in 2008. Power demand and emissions may increase again following the termination of the current recession. Thus, the CAMD emissions may not be reliable for making long-term projections.

   Commenter: Clean Air Council, PennFuture, Clean Water Action.

   Response: As shown in Figure 5-7 of the May 10, 2013 SIP document, heat input data from CAMD show rather steady EGU production levels after the height of the low-production levels in 2009 due to the recession. Continued decreases in EGU emissions are more likely attributable to deactivations due to environmental compliance, increased natural gas production, and other factors. The known and expected reductions included in the EGU analysis were based on announced deactivations and federal consent decrees, irrespective of electricity demands.

7. **Comment:** It was discovered during the public comment period of the supplemental SIP that the ethanol percentages in the model had not been revised to the newer methodology used by PA DEP. The fuel assumptions in the MOVES modeling used 0.00% ethanol in summer RVP months and 6.78% ethanol in winter months for both baseline and future modeled cases. The newer methodology, as recommended by EPA in mid-2012, uses 0.00% ethanol year-round for years up through 2009 and 10% ethanol year-round after 2009. However, considering the low mobile source emissions for the Liberty-Clairton area, any revision in the baseline or future case ethanol percentages would show negligible changes in the overall insignificance finding.

   Commenter: Jayme Graham, Allegheny County Health Department.

   Response: No response necessary.

Notes on commenters:

- Comments received jointly from Clean Air Council, Citizens for Pennsylvania's Future (PennFuture), and Clean Water Action were signed by the following:

    - Joseph Otis Minott, Esq., Executive Director, Clean Air Council
    - Tom Hoffman, Western Pennsylvania Director, Clean Water Action
    - Heather Langeland, Esq., Staff Attorney, PennFuture

    Contributing to these comments, on behalf of Clean Air Council, included the following:
    - Khanh Tran, Principal, AMI Environmental

- Additional comment made by Jayme Graham, Acting Manager, Air Quality Program, Allegheny County Health Department.

4.5 Certification of Adoption

CERTIFICATION of ADOPTION

To the best of my knowledge, information, and belief, I the undersigned hereby certify that the revision to the County's Portion of the Pennsylvania State Implementation Plan for the Attainment and Maintenance of the National Ambient Air Quality Standards for $PM_{2.5}$ was adopted by the Allegheny County Board of Health on March 3, 2014.

M. A. Parker

Michael A. Parker
Assistant Solicitor
Allegheny County Health Department

5/9/14
Date

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF ALLEGHENY)

On the 9 day of May, 2014,
Michael A Parker personally appeared before me, the undersigned authority, satisfactorily proven to me to be the person whose name appears above, and did in my presence execute the above certification for the purposes contained therein.

WHEREFORE, I have hereunto set my hand and official seal the 9 day of May, 2014.

NOTARIAL SEAL
JANET M NORKUS
Notary Public
PITTSBURGH CITY, ALLEGHENY COUNTY
My Commission Expires May 29, 2015

Janet M Norkus
NOTARY PUBLIC

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