Synopsis of Changes

Revised Canton-Massillion Maintenance Plan under the 1997 Ozone Standard

The original redesignation request and maintenance plan document was submitted to U.S. EPA on June 20, 2006. U.S. EPA approved this requests on May 16, 2007 (72 FR 27648).

Ohio EPA is now requesting a revision to the maintenance plan to update mobile emission projections and conformity budgets based on emission rates generated from U.S. EPA's latest mobile emissions model, the Motor Vehicle Emission Simulation (MOVES) 2010. In December 2009, MOVES replaced MOBILE6.2 as the U.S. EPA's official emission factor model. The area is still attaining and maintaining the 1997 8-hour ozone standard and the point, area and non-road emissions have not changed significantly and did not need to be updated for this submittal.

A redline/strike-out version of the original document follows this synopsis and identifies all changes that were made to the original approved request. In summary, revisions were made to the on-road (mobile) source emission estimates and budgets contained within the tables and text below. In addition, the discussion section regarding on-road modeling protocols was updated to identify the latest process applicable to the use of the newer MOVES model. Other minor changes were made to conform to current terminology, grammar, and formatting conventions.

In addition to this document, additional changes were also made to the Appendices of the original submittal, as follows:

- Appendix C: this appendix contains the detailed modeling protocol used to generate on-road mobile source emission estimates. The document contained within this revised submittal is an entirely new document compared to the original modeling protocol document submitted in 2006. Both the original and revised documents are available on Ohio EPA's website under the "Appendix" link.
- Appendix E: this appendix contains documents relevant to the public comment period and the public hearing. This will contain a revised public notice and revised hearing transcript. In some cases, if comments are received or testimony provided, it will also contain a revised response to comments document. Both the original and revised documents are available on Ohio EPA's website under the "Appendix" link.

These documents can all be found at: http://www.epa.ohio.gov/dapc/SIP/1997.aspx in the table under the heading "Redesignations and Maintenance Plans."

REQUEST FOR REDESIGNATION AND MAINTENANCE PLAN FOR ~~OZONE ATTAINMENT~~ ~~IN~~ THE CANTON-MASSILLON EIGHT-HOUR OZONE ~~BASIC~~ NONATTAINMENT AREA

Stark County, Ohio

Developed By:
Ohio Environmental Protection Agency
Division of Air Pollution Control

June 20, 2006
Revised November 2012

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REQUEST FOR REDESIGNATION AND
MAINTENANCE PLAN FOR ~~OZONE ATTAINMENT~~CANTON-MASSILLON
~~IN THE~~ EIGHT-HOUR OZONE ~~BASIC~~
NONATTAINMENT AREA

STARK COUNTY, OHIO

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CHAPTER ONE

Introduction

The Clean Air Act (CAA) requires areas failing to meet the National Ambient Air Quality Standard (NAAQS) for ozone to develop State Implementation Plans (SIP's) to expeditiously attain and maintain the standard. In 1997, the United States Environmental Protection Agency (U.S. EPA) revised the air quality standards for ozone replacing the 1979 one-hour standard with an eight-hour ozone standard set at 0.08 parts per million (ppm.) The standard was challenged legally and upheld by the U.S. Supreme Court in February of 2001.

On April 15, 2004, U.S. EPA designated 134 nonattainment areas for the eight-hour ozone standard. Since that time, U.S. EPA has reclassified nine of the 134 original nonattainment areas to the next lower classification. Section 107(d)(3)(E) of the CAA allows states to request nonattainment areas be redesignated to attainment providing certain criteria are met. The following are the criteria that must be met in order for an area to be redesignated from nonattainment to attainment:

i) A determination that the area has attained the eight-hour ozone standard.
ii) An approved SIP for the area under Section 110(k).
iii) A determination that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the SIP and other federal requirements.
iv) A fully approved maintenance plan under Section 175(A).
v) A determination that all Section 110 and Part D requirements have been met.

Background

As part of the 1990 CAA Amendments re-evaluation, Stark County was designated as Unclassifiable/Attainment for the one-hour ozone standard pursuant to the CAA and therefore, has not previously been subject to nonattainment area rule-makings. As a result of the 2004 ozone designations, U.S. EPA designated Stark County basic nonattainment and subject to the eight-hour ozone requirements, including development of a plan to reduce volatile organic compounds (VOCs) and oxides of nitrogen (NO_x) emissions and a demonstration that the area will meet the federal eight-hour air quality standard for ozone by June 2009.

This document is intended to support Ohio's request that Stark County be redesignated from nonattainment to attainment for the eight-hour ozone standard. Stark County has recorded three (3) years of complete, quality-assured ambient air quality monitoring data for the years 2003 – 2005 demonstrating attainment of the eight-hour ozone standard.

Geographical Description

Stark County is located in eastern Ohio and contains the City of Canton. Stark County is bordered by Summit and Portage Counties to the north, Mahoning and Columbiana to the east, Tuscarawas and Carroll to the south and Wayne and Holmes to the west. Stark County is shown in Figure 1.

Status of Air Quality

Ozone monitoring data for the most recent three (3) years, 2003 through 2005, demonstrates that the air quality has met the NAAQS for ozone in this basic nonattainment area. The NAAQS attainment, accompanied by decreases in emission levels discussed in Chapter four, supports a redesignation to attainment for Stark County based on requirements in Section 107(d)(3)(E) of the CAA.

CHAPTER TWO

Requirements for Redesignation

U.S. EPA has published detailed guidance in a document entitled *Procedures for Processing Requests to Redesignate Areas to Attainment* (redesignation guidance), issued September 4, 1992, to Regional Air Directors. This request for redesignation and maintenance plan is based on the redesignation guidance, supplemented with additional guidance received from staff of U.S. EPA Region V.

Below is a summary of each redesignation criterion as it applies to Stark County.

i.) Attainment of the standard:

There are two components involved in making this demonstration. The first component relies on ambient air quality data. The data that are used to demonstrate attainment should be the product of ambient monitoring that is representative of the area of highest concentration. The data should be collected and quality-assured in accordance with 40 CFR 58 and recorded in the Aerometric Information Retrieval System (AIRS) in order for it to be available to the public for review.

The second component relies upon supplemental U.S. EPA-approved air quality modeling. The supplemental modeling is not required for ozone nonattainment areas seeking redesignation. Therefore, this ozone redesignation request for Stark County does not include modeling data. However, in Appendix C the most recent modeling results showing future attainment and maintenance are provided. Chapter three discusses this requirement in more detail and provides the attainment demonstration.

ii.) SIP approval:

The SIP for the area must be fully approved under Section 110(k) and must satisfy all requirements that apply to the area. Ohio's SIP was approved on May 9, 1994 (59FR23799) March 23, 1995 (60FR15235) and includes Stark County. Chapter five discusses this requirement in more detail and provides the attainment demonstration.

iii.) Permanent and enforceable improvement in air quality;

The state must be able to reasonably attribute the improvement in air quality to emission reductions which are permanent and enforceable. The state should estimate the percent reduction achieved from federal measures as well as control measures that have been adopted and implemented by the state.

Stark County was not designated nonattainment for ozone as part of the 1990 CAA Amendments re-evaluation. As a result, Ohio has not adopted or implemented control measures beyond the federal measures, the initial 1979 statewide rules and those 1994 and 1995 rules which applied to "rural" attainment areas. Chapters four and five discuss this requirement in more detail and provide the attainment demonstration.

iv.) Section 110 and Part D requirements:
For purposes of redesignation, a state must meet all requirements of Section 110 and part D that were applicable prior to submittal of the complete redesignation request.

Part D consists of general requirements applicable to all areas which are designated nonattainment based on a violation of the NAAQS.

i.) Section 172(c) requirements
This section contains general requirements for nonattainment plans. The requirements for reasonable further progress, identification of certain emissions increases, and other measures needed for attainment will not apply for redesignations because they only have meaning for areas not attaining the standard. The requirements for an emission inventory will be satisfied by the inventory requirements of the maintenance plan.

ii.) Conformity
The state must work with U.S. EPA to show that its SIP provisions are consistent with section 176(c)(4) conformity requirements. The redesignation request should include conformity procedures, if the state already has these procedures in place. If a state does not have conformity procedures in place at the time that it submits a redesignation request, the state must commit to follow U.S. EPA's conformity regulation upon issuance, as applicable. Chapter five discusses this requirement in more detail and provides the attainment demonstration.

v.) Maintenance plans.
Section 107(d)(3)(E) stipulates that for an area to be redesignated, U.S. EPA must fully approve a maintenance plan which meets the requirements of Section 175(A). The maintenance plan will constitute a SIP revision and must provide for maintenance of the relevant NAAQS in the area for at least 10 years after redesignation. Section 175 (A) further states that the plan shall contain such additional measures, if any, as may be necessary to ensure such maintenance.

In addition, the maintenance plan shall contain such contingency measures as the Administrator deems necessary to ensure prompt correction of any violation of the NAAQS. At a minimum, the contingency measures must include a requirement that the state will implement all measures contained in the nonattainment SIP prior to redesignation.

States seeking redesignation of a nonattainment area should consider the following provisions:

a.) attainment inventory;
b.) maintenance demonstration;
c.) monitoring network;
d.) verification of continued attainment; and
e.) contingency plan.

Chapter six discusses this requirement in more detail and provides the attainment demonstration.

CHAPTER THREE

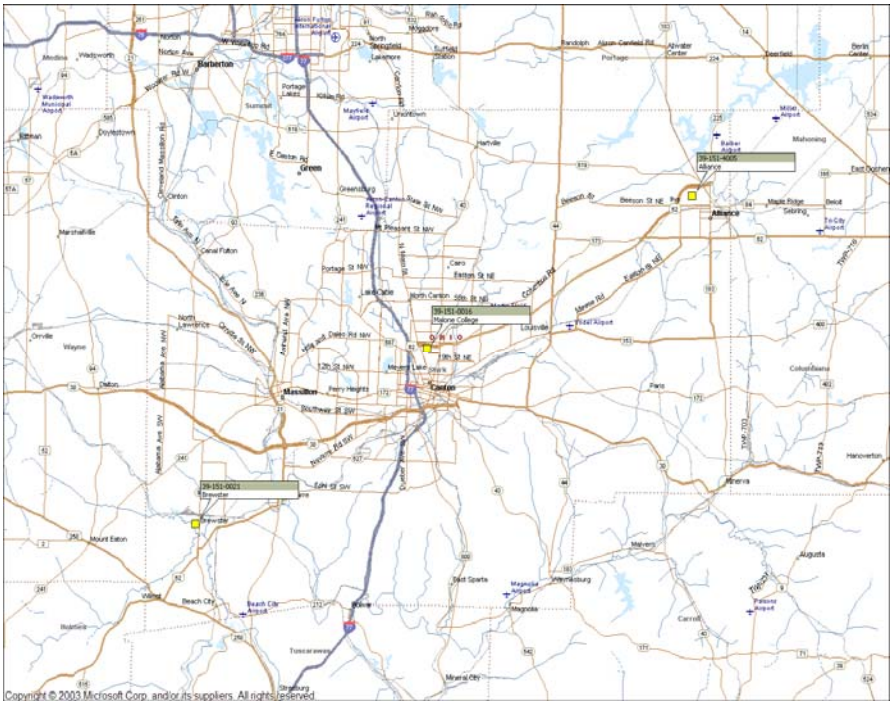
OZONE MONITORING
CAA Section107 (d)(3)(E)(i)

Requirement 1 of 4:
A demonstration that the NAAQS for ozone, as published in 40 CFR 50.4, has been attained. Ozone monitoring data must show that violations of the ambient standard are no longer occurring.

Background:
There are three monitors measuring ozone concentrations in this nonattainment area. The monitors are operated by Canton City Health Department's Air Pollution Control Section. The locations of the monitoring sites for this nonattainment area are shown in Figure 1.

Demonstration:

Figure 1 **Map of Stark County**



Requirement 2 of 4:
Ambient monitoring data quality assured in accordance with 40 CFR 58.10, recorded in the U.S. EPA Air Quality System (AQS) database, and available for public view.

Demonstration:
The Ohio Environmental Protection Agency (Ohio EPA) has quality assured all data shown in Appendix A in accordance with 40 CFR 58.10 and the Ohio Quality Assurance Manual. Ohio EPA has recorded the data in the AQS database and therefore data are available to the public.

Requirement 3 of 4:
A showing that the three-year average of the fourth highest values, based on data from all monitoring sites in the area or its affected downwind environs, are below 85 parts per billion (ppb). This showing must rely on three (3) complete, consecutive calendar years of quality assured data.

Background:
The following information is taken from U.S. EPA's "Guideline on Data Handling Conventions for the eight-hour Ozone National Ambient Air Quality Standard (NAAQS)," U.S. EPA-454/R-98-017, December 1998.

Three (3) complete years of ozone monitoring data are required to demonstrate attainment at a monitoring site. The eight-hour primary and secondary ozone ambient air quality standards are met at an ambient air quality monitoring site when the three-year average of the annual fourth-highest daily maximum eight-hour average ozone concentration is less than or equal to 0.08 ppm. When this occurs, the site is said to be in attainment. Three (3) significant digits must be carried in the computations. Because the third decimal digit, in ppm, is rounded, 0.084 ppm is the largest concentration that is less than or equal to 0.08 ppm. Therefore, for the purposes of this request, the eight-hour standard is considered to be 0.085 ppm. Values below 0.085 ppm meet the standard, values equal to or greater than 0.085 ppm exceed the standard. These data handling procedures are applied on an individual basis at each monitor in the area. An area is in compliance with the eight-hour ozone NAAQS if, and only if, every monitoring site in the area meets the NAAQS. An individual site's three (3) year average of the annual fourth highest daily maximum eight-hour average ozone concentration is also called the site's design value. Table 1 shows the monitoring data for the three most recent years, 2003 - 2005, at the nonattainment area sites and was retrieved from the U.S. EPA AQS.

Demonstration:

Table 1: Monitoring Data for Stark County 2003 – 2005

Data source: **U.S. EPA Air Quality System (AQS).**
http://www.epa.gov/ttn/airs/airsaqs/index.htm

SITE ID	COUNTY	ADDRESS	YEAR	%OBS	1st 8-HR	2nd 8-HR	3rd 8-HR	4th 8-HR	2003-2005 AVERAGE
39-151-0016	STARK	MALONE COLLEGE	2003	100	.106	.104	.092	.087	.079
39-151-0016	STARK	MALONE COLLEGE	2004	92	.086	.082	.076	.074	
39-151-0016	STARK	MALONE COLLEGE	2005	96	.087	.080	.079	.076	
39-151-0021	STARK	245 WEST FIFTH	2003	100	.099	.099	.090	.085	.077
39-151-0021	STARK	245 WEST FIFTH	2004	99	.085	.075	.073	.071	
39-151-0021	STARK	245 WEST FIFTH	2005	100	.083	.078	.077	.076	
39-151-4005	STARK	1175 WEST VINE	2003	100	.116	.106	.101	.086	.082
39-151-4005	STARK	1175 WEST VINE	2004	98	.084	.079	.076	.076	
39-151-4005	STARK	1175 WEST VINE	2005	100	.106	.088	.087	.086	
								Highest Average	**0.82 ppm**

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A comprehensive list of the site's design values during the 2003-2005 time period is in Appendix A. The area's design value has trended downward as emissions have declined due to such factors as cleaner automobiles and fuels both regionally and locally. U.S. EPA's rule to control nitrogen oxides from specific source categories (40 CFR Parts 51, 72, 75 and 96, published on October 17, 1998 and referred to as the NO_x SIP Call) has significantly reduced emissions from large electric generating units (EGUs), industrial boilers, and cement kilns. Ohio's NO_x Budget Trading Program rule was approved on May 25, 2004 [Ohio Administrative Code (OAC) Chapter 3745-14]. It is expected that this downward trend will continue as the above programs continue and some form of the U.S. EPA Clean Air Interstate Rule (CAIR) is implemented.

Requirement 4 of 4:
A commitment that once redesignated, the state will continue to operate an appropriate monitoring network to verify the maintenance of the attainment status.

Demonstration:
Ohio commits to continue monitoring ozone levels at the site indicated in Figure 1. Ohio EPA will consult with U.S. EPA Region V staff prior to making changes to the existing monitoring network, should changes become necessary in the future. Ohio EPA will continue to quality assure the monitoring data to meet the requirements of 40 CFR 58. Connection to a

central station and updates to the Ohio EPA Web site[1] will provide real time availability of the data and knowledge of any exceedances. Ohio EPA will enter all data into AQS on a timely basis in accordance with federal guidelines.

CHAPTER FOUR

EMISSION INVENTORY
CAA Section107 (d)(3)(E)(iii)

U.S. EPA's redesignation guidance requires the submittal of a comprehensive inventory of ozone precursor emissions (VOC and NO_x) representative of the year when the area achieves attainment of the ozone air quality standard. Ohio also must demonstrate that the improvement in air quality between the year that violations occurred and the year that attainment was achieved is based on permanent and enforceable emission reductions. Other emissions inventory related requirements include a projection of the emission inventory to a year at least 10 years following redesignation; a demonstration that the projected level of emissions is sufficient to maintain the ozone standard; and a commitment to provide future updates of the inventory to enable tracking of emission levels during the 10 year maintenance period.

Requirement 1 of 5:
A comprehensive emission inventory of the precursors of ozone completed for the base year.

Background:
The point source data are taken from Ohio's annual emissions reporting program. The 2002 periodic inventory has been identified as the preferred data base for SIP development and does coincide with nonattainment air quality in Stark County.

As part of the NO_x SIP Call, many states including Ohio were required to adopt into their rules a budget for all large EGUs. Ohio's budget is adopted at OAC Chapter 3745-14. The budget represents a statewide cap on NO_x emissions. These emissions, capped by the state rule, should remain at or near this level through the maintenance period covered by this request.

Periodic inventories, which include emissions from all sectors - mobile, area, non-road, and point sources - are prepared every three (3) years.

Demonstration:

[1] www.epa.state.oh.us/dapc/

While ozone and its precursors are transported into this region from outside areas, this information does provide some indication of the impact from Ohio sources near the nonattainment area. The emissions are decreasing substantially in response to regional and national programs affecting many EGUs such as the Acid Rain program and the NO_x SIP Call. Other sectors of the inventory also impact ozone formation, but large regional sources such as EGUs have a substantial impact on the formation of ozone.

Requirement 2 of 5:
A projection of the emission inventory to a year at least 10 years following redesignation.

Background:
Ohio EPA prepared a comprehensive inventory for Stark County, including area, mobile, and point sources for precursors of ozone (volatile organic compounds and nitrogen oxides) for base year 2002. The information below describes the procedures Ohio EPA used to generate the 2002 base inventories. These inventories were provided to LADCO and have been processed to develop summer day emissions for use in the air quality analyses. These processed modeling inventories have been identified as the correct iteration of the inventory for use in the redesignation. In this document, references to LADCO include the Midwest Regional Planning Organization.

- Area sources were taken from the Ohio 2002 periodic inventory submitted to U.S. EPA. These projections were made from the U.S. Department of Commerce Bureau of Economic Analysis (BEA) growth factors, with some updated local information.
- Mobile source emissions were calculated using emissions factors produced with ~~MOBILE6.2~~MOVES 2010.
- Point source information was compiled from Ohio EPA's 2002 annual emissions inventory database and the 2002 U.S. EPA Air Markets acid rain database[2].
- Biogenic emissions are not included in these summaries.
- Non-road emissions were generated by using U.S. EPA's National Mobile Inventory Model (NMIM) 2002 application. To address concerns about the accuracy of some of the categories in U.S. EPA's non-road emissions model, LADCO contracted with two (2) companies to review the base data and make recommendations. One of the contractors also estimated emissions for three (3) non-road categories not included in U.S. EPA's non-road model. Emissions were estimated for aircraft, commercial marine vessels and railroads.

[2] http://www.epa.gov/airmarkets/acidrain

Recreational motorboat population and spatial surrogates (used to assign emissions to each county) were significantly updated. The populations for the construction equipment category were reviewed and updated based upon surveys completed in the Midwest and the temporal allocation for agricultural sources also was updated.

Demonstration:

On-Road Emission Estimations

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In coordination with the Stark County Area Transportation Study (SCATS) the Ohio Department of Transportation (Ohio DOT) utilizes a regional travel demand forecast model to simulate traffic in the area and to forecast traffic flows for given growth expectations. The model is primarily used as a long range planning tool to evaluate the transportation system including determination of locations where additional travel capacity may be needed and to determine the infrastructure requirements necessary to meet that need. It is also used as a tool for air quality purposes to estimate the total emissions of pollution caused by vehicles in the area. The travel demand forecasting model is used to predict the total daily vehicle miles traveled (VMT) and an EPA computer program called ~~MOBILE6.2~~MOVES 2010 is used to calculate emissions per mile. The product of these is the total amount of pollution emitted by the on-road vehicles for the particular analyzed area~~. In areas outside the regional travel demand model, traffic counts and statewide traffic growth rates are used for the VMT estimates~~.

Overview

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~~Broadly described, MOBILE6.2 is used to generate "emission factors", which are the average emissions per mile (grams/mile) for ozone precursors, NO_x and VOC. The MOBILE6.2~~Broadly described, MOVES 2010MOVES 2010 model includes a number of variables that affect the emission factors. These variables have national default values, some of which require modification to reasonably reflect local conditions. Some of these variables are discussed here. The vehicle fleet (vehicles on the road) age and the vehicle type have a major effect on the emission factors. The ~~vehicle~~source types are traveling on ~~facility~~road types~~. Vehicle~~ (MOVES 2010 road types are Rural Restricted Access, Rural Unrestricted Access, Urban Restricted Access, and Urban Unrestricted Access). The vehicle speeds also affect the emission factor values. Meteorological conditions such as air temperature and humidity ~~also significantly affects~~have a significant effect on emission factors. Emission factors produced by ~~MOBILE6.2~~MOVES 2010 can also include the effect of emission reduction strategies such as vehicle inspection and maintenance programs, regulation of fuels, etc. ~~-~~These ~~MOBILE6.2~~MOVES 2010 inputs are estimated using the best available data~~ and~~.

These inputs are reviewed and agreed to by U.S. EPA and transportation

agencies in a formal interagency consultation process. Emission factors are multiplied by VMT from the travel demand model to estimate the total vehicle emissions.

~~There are a number of ways emission factors from MOBILE6.2 can be used with the travel demand model information. One of the simplest methods is to input extensive vehicle fleet, area-specific speed and facility type information MOBILE6.2 to generate a single emission factor that represents the average for all vehicles and facility types in the modeled area. This only requires multiplying this emission factor by the total VMT of the analyzed area to get the total emissions for the area. Another method is to create multi-dimensional emission factor "look-up" tables that describe the emission factors by speed, temperature, and facility type. This requires more extensive processing, but the resulting total emissions of this method are more sensitive to even minor changes in the roadway system. Tables of emission factors are created using MOBILE6.2 for each facility type, temperature, and speed given the vehicle fleet on that facility. Then, the travel model provides information on each segment of road (or "link") regarding speed and facility type which is then "looked-up" in the appropriate emission factor table. It should be noted that speed is estimated as a post process to the travel demand model. Speeds are not taken directly from the travel demand model. The post process for emissions analysis by Ohio DOT is by hour of day. This emission factor is multiplied by the link's traffic-volume and length or VMT to get the emissions from that link for that hour. There are other methods as well, each with its advantages and disadvantages. The Stark County analysis uses the latter more complex method, a table of emission factors.~~

~~It should be noted that each year analyzed will have different emission factors, volumes, speeds and roadway networks.~~

~~Some of the assumptions built into MOBILE6.2 are: older vehicles have much higher emission factors than newer vehicles, diesel vehicles have much higher NO_x emission factors and lower VOC emission factors than gasoline vehicles, and higher average speeds have lower emission factors except for diesel vehicles which have higher NO_x at higher speeds. MOBILE6.2~~

The emission factors from MOVES 2010 can be used with the travel demand model information by combining the disaggregate emission rates with VMT, and source type population for each road type, source type and hour of day, and then sum them up to get the total emissions for the area.

The Stark County analysis method, developed by Ohio DOT, is to aggregate the emission rates by two source types (cars & trucks), then applying VMT and source type population, thereby reducing the intensive processes. In the

first step emission factors are broadly classified into total vehicles, cars and trucks by pollutant, by average speed, road type and hour of day. Then the hourly link volumes generated from travel demand model are combined with emission factors for each network link for each hour. The on-road vehicle emissions for the area is the sum of all individual link-hour emissions. Vehicle-based emissions are obtained by the combination of corresponding emission factors and source type population. Intrazonal emissions are computed using a separate method to account for those trips that use local roads to travel within a zone. Intrazonal VMT is combined with corresponding emission factors to get intrazonal emissions. Total emissions are sum of on-road vehicle emissions, vehicle-based emissions and intrazonal emissions.

Automated programs, using FORTRAN and CUBE scripting, were developed by Ohio DOT to generate total emissions. The process uses data on daily and directional traffic distributions as well as more up to date volume/delay functions from the 2000 Highway Capacity Manual (HCM). This process also handles the newer model network formats and MOVES 2010 generated emission factors.

MOVES 2010 input and output files are provided in Appendix C.

Best Available Data

Most current vehicle age distribution data, temperature data, ~~and~~ fuel properties data, source type distribution data, and I/M data provided by Ohio DOT's ATRs and WIMs, NOAA, ODPS, and Ohio EPA ~~was~~were used by the Ohio DOT for generating emission factors. Likewise, the most current transportation planning data available from ~~the~~ SCATS and most current Ohio DOT count data ~~was~~were used by ~~the~~ Ohio DOT for the emissions estimates~~. Details about each data set and how it was used is documented in Ohio DOT's "SCATS 8-Hour Ozone Air Quality Conformity Analysis Technical Memo" dated 5/24/2006~~.

Analysis Years

Analysis years for this re-designation request include 2002, 2004, 2009, and 2018 to meet the requirements specified by the CAA and U.S. EPA. The travel demand model presents the transportation system conditions for each of these years. Model runs for each future analysis year contain the road network SCATS and ~~ODOT~~Ohio DOT expects to exist at the beginning of that year with corresponding socioeconomic forecasts for that year.

Local Road VMT

Most local roads such as subdivision streets are not explicitly modeled in a travel demand model. These local roads are represented as fictitious roadways called centroid connectors. Local road VMT is included in the Ohio DOT post process by including the traffic loaded on centroid connectors. In

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addition, some local road traffic is captured as intra-zonal trips which travel demand models usually do not assign to roadway segments. The Ohio ~~Dot~~DOT post process includes these trips as local road VMT.

Model area VMT

For Stark County, the travel demand model covers the entire county and a portion of Mahoning County. VMT for the portion of model which extends beyond Stark County is removed before total emissions are calculated.

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Emission Estimations

Table 2 contains the results of the emissions analysis for the appropriate years.

Table 2 Emission Estimations for On-Road Mobile Sources for Stark County, Ohio

Data source: On-road only, Ohio DOT Modeling and Forecasting Section.

Stark County	2002	2004	2009	2018
VMT (miles/day)	~~7,929,790~~8,245,109	8,~~014,259~~511,311	8,~~490,027~~597,080	8,~~8~~
VOC (tons/day)	~~16.56~~24.34	~~14.03~~22.56	~~8.71~~16.67	
NO_x (tons/day)	~~25.~~35.19	~~22.00~~33.14	~~15.68~~24.66	

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Motor Vehicle Emission Budget

Table 3 contains the motor vehicle emissions budget for Stark County.

Table 3 Mobile Vehicle Emission Budget for Stark County

Data source: On-road only, Ohio DOT Modeling and Forecasting Section.

	2009	2018
VOC (tons/day	~~10.02~~19.17	~~5.37~~9.02
NO_x (tons/day)	~~18.03~~28.36	~~7.08~~11.37

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This budget includes the emission estimates calculated for 2009 and 2018. The emission estimates are derived from the Tranplan travel demand model and ~~MOBILE6.2~~MOVES 2010 as described above under the expected ~~Stark County Area Transportation Study (~~SCATS~~)~~ 2030 Long Range Plan. The mobile source budget includes ~~5~~9.02 tons/day for VOC and11.37 tons/day for ~~VOC and 7.08 tons/day for~~ NO_x~~.~~ for 2018 and 19.17 tons/day for VOC and 28.36 tons/day for NO_x for 2009. These correspond to a 15 percent increase from the 2009 and 2018 on-

road emissions for both VOC and NO_x. Appendix C contains data tables and graphs of these emissions.

All methodologies, latest planning assumptions and the safety margins were determined through the interagency consultation process described in the Transportation Conformity Memorandum of Understanding (MOU) for SCATS.

Requirement 3 of 5:
A demonstration that the projected level of emissions is sufficient to maintain the ozone standard.

Background:
In consultation with U.S. EPA, Ohio EPA selected the year 2018 as the maintenance year for this redesignation request. This document contains projected emissions inventories for 2009 and 2018.

Ohio EPA performed emission projections for Stark County using the following approaches.

- Mobile source emission projections are based on the U.S. EPA ~~MOBILE6.2~~MOVES 2010 model. The analysis is described in more detail in Appendix C. All projections were made in accordance with "Procedures for Preparing Emissions Projections" U.S. EPA-45/4-91-019.
- Emissions inventories are required to be projected to future dates to assess the influence growth and future controls will have. The LADCO have developed growth and control files for point, area, and non-road categories. These files were used to develop the future year emissions estimates used in this document. This was done so the inventories used for redesignation are consistent with modeling performed in the future.

The detailed inventory information for Stark County for 2004, 2009 and 2018 is in Appendix B. Emission trends are an important gauge for continued compliance with the ozone standard. Therefore, Ohio EPA performed an

initial comparison of the inventories for the base year and maintenance years for Stark County. Mobile source emission inventories are described in Appendix B. In addition to LADCO estimates, point source emissions were projected based upon the statewide EGU NO_x budgets from the Ohio NO_x rule.

The following tables include sectors Electrical Generating Unit (EGU-Point), Non-Electrical Generating Unit (Non-EGU), Non-road Mobile (Non-road), Other Area (Other), Marine, Aircraft, Rail (MAR), On-road Mobile (On-road).

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Demonstration:

Table 4 Stark County VOC Emission Inventory Totals for Base Year 2002, Estimated 2004 and Projected 2009 and 2018 (tons per day)

Data source: Midwest Regional Planning Organization (MRPO) and Lake Michigan Air Directors Consortium (LADCO) Web site: http://www.ladco.org/tech/emis/basek/BaseK_Reports.htm.
Data source: On-road only, Ohio DOT Modeling and Forecasting Section.

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Sector	2002 Base	2004 Attainment	2009 Interim	2018 Maintenance	Safety Margin
EGU Point	n/a	n/a	n/a	n/a	-
Non-EGU	2.90	2.97	3.14	3.77	-
Non-road	5.83	5.29	3.92	3.22	-
Other	21.23	21.03	20.49	21.93	-
MAR	0.15	0.15	0.14	0.14	-
On-road	~~16.56~~24.34	~~14.03~~22.56	~~10.02~~19.17*	~~5.37~~9.02*	-
TOTAL	**~~46.67~~54.45**	**~~43.47~~52.00**	**~~37.71~~46.86**	**~~34.43~~38.08**	**~~9.04~~13.92**

* includes 15 percent increase to the mobile source budget

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Table 5 **Stark County NO_x Emission Inventory Totals for Base Year 2002, Estimated 2004 and Projected 2009 and 2018 (tons per day)**

Data source: Midwest Regional Planning Organization (MRPO) and Lake Michigan Air Directors Consortium (LADCO) Web site: http://www.ladco.org/tech/emis/basek/BaseK_Reports.htm.
Data source: On-road only, Ohio DOT Modeling and Forecasting Section.

Sector	2002 Base	2004 Attainment	2009 Interim	2018 Maintenance	Safety Margin
EGU Point	n/a	n/a	n/a	n/a	-
Non-EGU	5.12	4.85	4.16	4.72	-
Non-road	6.78	6.22	4.81	2.50	-
Other	~~1.17~~	1.23	1.40	1.46	-
MAR	3.28	3.03	2.39	2.22	-
On-road	~~25.~~35.19	~~22.00~~33.14	~~18.03~~28.36*	~~7.08~~11.37*	-
TOTAL	~~41.70~~51.54	~~37.33~~48.47	~~30.79~~41.12	~~17.98~~22.27	~~19.35~~26.20

* includes 15 percent increase to the mobile source budget

Table 6 **Stark County Comparison of 2004 attainment year and 2018 projected emission estimates (tons per day, Summer)**

Data source: Midwest Regional Planning Organization (MRPO) and Lake Michigan Air Directors Consortium (LADCO) Web site: http://www.ladco.org/tech/emis/basek/BaseK_Reports.htm.
Data source: On-road only, Ohio DOT Modeling and Forecasting Section.

	2004	2018	Projected Change
VOC	~~43.47~~52.00	~~34.43~~38.08	~~8.04~~13.92
NO_x	~~37.33~~48.47	~~17.98~~22.27	~~19.35~~26.20

VOC emissions in the non-attainment area are projected to decrease by ~~8.04~~13.92 tons per day (tpd). Area source emissions and, to a lesser extent, point sources, show an increase due to expectations that the population will

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grow in this area. However, cleaner vehicles and fuels are expected to be in place in 2009 and 2018 and result in an overall drop in VOC emissions.

NO_x emissions in the nonattainment area are projected to decrease by ~~19.35~~26.20 tpd. Decreases from U.S. EPA rules covering Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements[3], Highway Heavy-Duty Engine Rule[4] and Non-Road Diesel Engine Rule[5] also factored into the changes. Further, due to implementation of the NO_x SIP Call across the eastern United States, NO_x and ozone levels entering this also decreased.

Requirement 4 of 5:
A demonstration that improvement in air quality between the year violations occurred and attainment was achieved is based on permanent and enforceable emission reductions and not on temporary adverse economic conditions or unusually favorable meteorology.

Background:
Ambient air quality data from all monitoring sites indicate that air quality met the NAAQS for ozone in 2005. U.S. EPA's redesignation guidance (p 9) states, "A state may generally demonstrate maintenance of the NAAQS by either showing that future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory, or by modeling to show that the future mix of sources and emissions rates will not cause a violation of the NAAQS."

In Ohio, major point sources in all counties are required to submit air emissions information once every three (3) years or annually if VOC potential to emit is greater than 250 tons or NO_x potential to emit is greater than 2500 tons, in accordance with U.S. EPA's Consolidated Emissions Reporting Rule (CERR). Ohio EPA prepares a new periodic inventory for all ozone precursor emission sectors every three (3) years. These ozone precursor inventories will be prepared for 2005, 2008, and 2011 as necessary to comply with the inventory reporting requirements established in the CAA. Emissions information will be compared to the 2002 base year and the 2018 projected maintenance year inventories to assess emission trends, as necessary, to assure continued compliance with the ozone standard.

Demonstration:
Permanent and enforceable reductions of volatile organic compounds and oxides of nitrogen have contributed to the attainment of the eight-hour ozone

[3] http://www.epa.gov/fedrgstr/EPA-AIR/2000/February/Day-10/a19a.htm
[4] http://www.epa.gov/fedrgstr/EPA-AIR/1997/October/Day-21/a27494.htm
[5] http://www.epa.gov/fedrgstr/EPA-AIR/1998/October/Day-23/a24836.htm

standard. Some of these reductions were due to the application of tighter federal standards on new vehicles. Also, Title IV of the CAA and the NO_x SIP Call required the reduction of oxides of nitrogen from utility sources. While no EGU reductions occurred within Stark County, statewide NO_x reductions from EGUs were over 85 percent due to this program.

Table 7 Stark County Comparison of 2002 base year and 2004 attainment year on-road and EGU reductions

Data source: Midwest Regional Planning Organization (MRPO) and Lake Michigan Air Directors Consortium (LADCO) Web site: http://www.ladco.org/tech/emis/basek/BaseK_Reports.htm.
Data source: On-road only, Ohio DOT Modeling and Forecasting Section.

	2002	2004
On-road VOC	~~16.56~~24.34	~~14.03~~22.56
On-road NO_x	~~25.~~35.19	~~22.00~~33.14
EGU NO_x	n/a	n/a

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Requirement 5 of 5:
Provisions for future annual updates of the inventory to enable tracking of the emission levels including an annual emission statement from major sources.

Demonstration:
As required by Section 175A(b) of the CAA, Ohio commits to submit to the Administrator, eight (8) years after redesignation, an additional revision of this SIP. The revision will contain Ohio's plan for maintaining the national primary ozone air quality standard for 10 years beyond the first 10 year period after redesignation~~.~~

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CHAPTER FIVE

CONTROL MEASURES AND REGULATIONS

CAA Section107 d)(3)(E)(ii), 107(d)(3)(iv) & 107(d)(3)(E)(v)

Requirement 1 of 4:
An U.S. EPA approved SIP control strategy that includes RACT requirements for existing stationary sources covered by Control Technology Guidelines (CTG) as applied in Ohio's rural counties.

Background:

As required by Section 172 of the 1990 CAA Amendments, in the mid-1990's Ohio promulgated rule requiring RACT for emissions of VOCs. There were no specific rules required by the CAA such as RACT for existing sources beyond statewide rules.

Demonstration:
Statewide RACT rules have been applied to all new sources locating in Ohio since that time. The Ohio rules are found in OAC Chapter 3745-21.

Requirement 2 of 4:
Evidence that control measures required in past ozone SIP revisions have been fully implemented.

Background:
The U.S. EPA NO_x SIP Call required 22 states to pass rules that would result in significant emission reductions from large EGUs, industrial boilers, and cement kilns in the eastern United States. Ohio passed this rule in 2001. Beginning in 2004, this rule accounts for a reduction of approximately 31 percent of all NO_x emissions statewide compared to previous uncontrolled years. The other 21 states also have adopted these rules.

Demonstration:
U.S. EPA and Ohio EPA performed modeling that indicated this area would attain the eight-hour ozone standard with the implementation of the NO_x SIP Call. Controls for EGUs formally commenced May 31, 2004. Emissions covered by this program have been generally trending downward since 1998 with larger reductions occurring in 2002 and 2003. Data taken from U.S. EPA Clean Air Markets Web site, quantifies the gradual NO_x reductions that have occurred in Ohio as a result of Title IV of the 1990 CAA Amendments and the beginning of the NO_x SIP Call Rule. Ohio developed the NO_x Budget Trading Program rules in OAC Chapter 3745-14 in response to the SIP Call. OAC chapter 3745-14 regulated EGUs and certain non-EGUs under a cap and trade program based on an 85 percent reduction of NO_x emissions from EGUs and a 60 percent reduction of NO_x emissions from non-EGUs, compared to historical levels. This cap will stay in place through 2008, at which time the CAIR program will supersede it.

U.S. EPA has recently published Phase II of the NO_x SIP Call that establishes a budget for large (greater than 1 ton per day emissions) stationary internal combustion engines. Ohio EPA's proposed rule OAC 3745-14-12 addresses stationary internal combustion engines, all used in natural gas pipeline transmissions. An 82 percent NO_x reduction from 1995 levels is anticipated. Completion of the compliance plan is expected by May 1, 2006 and the compliance demonstration will begin May 1, 2007. The 2007 controlled NO_x emissions will be 599 tons per day.

Tier II Emission Standards for Vehicles and Gasoline Sulfur Standards

In February 2000, U.S. EPA finalized a federal rule to significantly reduce emissions from cars and light trucks, including sport utility vehicles (SUVs). Under this proposal, automakers will be required to sell cleaner cars, and refineries will be required to make cleaner, lower sulfur gasoline. This rule will apply nationwide. The federal rules will phase in between 2004 and 2009. U.S. EPA has estimated that NO_x emission reductions will be approximately 77 percent for passenger cars, 86 percent for smaller SUVs, light trucks, and minivans, 65 to 95 percent reductions for larger SUVs, vans, and heavier trucks. VOC emission reductions will be approximately 12 percent for passenger cars, 18 percent for smaller SUVs, light trucks, and minivans, and 15 percent for larger SUVs, vans, and heavier trucks.

Heavy-Duty Diesel Engines

In July 2000, U.S. EPA issued a final rule for Highway Heavy Duty Engines, a program which includes low-sulfur diesel fuel standards, which will be phased in from 2004 through 2007. This rule applies to heavy-duty gasoline and diesel trucks and buses. This rule will result in a 40 percent reduction in NO_x from diesel trucks and buses, a large sector of the mobile sources NO_x inventory.

Clean Air Non-road Diesel Rule

In May 2004, U.S. EPA issued the Clean Air Non-road Diesel Rule. This rule applies to diesel engines used in industries such as construction, agriculture, and mining. It also contains a cleaner fuel standard similar to the highway diesel program. The new standards will cut emissions from non-road diesel engines by more than 90 percent. Non-road diesel equipment, as described in this rule, currently accounts for 47percent of diesel particulate matter (PM) and 25 percent of NO_x from mobile sources nationwide. Sulfur levels will be reduced in non-road diesel fuel by 99 percent from current levels, from approximately 3,000 ppm now to 15 ppm in 2009.

Together, these rules will substantially reduce local and regional sources of ozone precursors.

Requirement 3 of 4:

Acceptable provisions to provide for new source review.

Background:

Ohio has a long standing and fully implemented New Source Review (NSR) program. This is addressed in OAC Chapter 3745-31. The chapter includes provisions for the Prevention of Significant Deterioration (PSD) permitting program in OAC 3745-31-01 to 3745-31-20. Ohio's PSD program was

conditionally approved on October 10, 2001 (66 FR 51570) and received final approval on January 22, 2003 (68FR 2909) by U.S. EPA as part of the SIP.

Demonstration:
Any facility that is not listed in the 2002 emission inventory, or for the closing of which credit was taken in demonstrating attainment, will not be allowed to construct, reopen, modify, or reconstruct without meeting all applicable permit rule requirement. The review process will be identical to that used for new sources. Once the area is redesignated, Ohio EPA will implement NSR through the PSD program.

Requirement 4 of 4:
Assure that existing controls will remain in effect after redesignation unless the State demonstrates through photochemical modeling that the standard can be maintained without one (1) or more controls.

Demonstration:
Ohio commits to maintaining the aforementioned control measures after redesignation. Ohio hereby commits that any changes to its rules or emission limits applicable to VOC and/or NO_x sources, as required for maintenance of the ozone standard in Stark County, will be submitted to U.S. EPA for approval as a SIP revision.

Ohio, through Ohio EPA's Legal section, has the legal authority and necessary resources to actively enforce any violations of its rules or permit provisions. After redesignation, it intends to continue enforcing all rules that relate to the emission of ozone precursors in Stark County.

LADCO Modeling Analysis for eight-hour Ozone Standard Assessment

LADCO performed modeling to evaluate the effect of the NO_x SIP Call and Tier II / Low Sulfur rule for future year 2007 ozone in the Lake Michigan area. This modeling was originally designed to assess the one-hour ozone standard. Further analysis was conducted and documented in the LADCO's White Paper "8-Hour Ozone Assessment" dated May 2, 2001. Base year design values used were the average of the design values for the three (3) three-year periods (1994-1996, 1995-1997, and 1996-1998). Base year emissions were taken from 1996 and four (4) ozone episodes were evaluated: June 22-28, 1991; July 14-21, 1991

While modeling results were not calculated for Stark County, the average decrease in ozone from the base case modeling run with modeling runs that applied emission controls required by the CAA, NO_x SIP Call and Tier II /low-sulfur requirements was 15 ppb (2009 Future design value of 73.3ppb*.) [* LADCO Base K 2009 Future Base case with on-the-books" including CAIR].

LADCO Modeling for CAIR of 2004

On March 10, 2004, the U.S. EPA promulgated CAIR. NO_x emissions will be cut from 4.5 million tons in 2004, to a cap of 1.5 million tons by 2009, and 1.3 million tons in 2018 in 28 eastern states and the District of Columbia.

LADCO performed modeling to support the associated emission reductions for CAIR. This modeling was based on 2001 – 2002 design values for Stark County. Results of the CAIR modeling show Stark County will continue to attain the eight-hour ozone NAAQS well into the future.

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CHAPTER SIX

CONTINGENCY MEASURES

CAA Section 107(d)(3)(E)(v)

Requirement 1 of 4:
A commitment to submit a revised plan eight (8) years after redesignation.

Demonstration:
Ohio hereby commits to review its maintenance plan eight (8) years after redesignation, as required by Section 175(A) of the CAA.

Requirement 2 of 4:
A commitment to expeditiously enact and implement additional contingency control measures in response to exceeding specified predetermined levels (triggers) or in the event that future violations of the ambient standards occur.

Demonstration:
Ohio hereby commits to adopt and expeditiously implement necessary corrective actions in the following circumstances:

Warning Level Response:
A warning level response shall be prompted whenever an annual (1-year) fourth high monitored value of 88 ppb occurs in a single ozone season within the maintenance area. A warning level response will consist of a study to determine whether the ozone value indicates a trend toward higher ozone values or whether emissions appear to be increasing. The study will evaluate whether the trend, if any, is likely to continue and, if so, the control measures necessary to reverse the trend taking into consideration ease and timing for implementation as well as economic and social considerations. Implementation of necessary controls in response to a warning level response trigger will take place as expeditiously as possible, but in no event later than 12 months from the conclusion of the most recent ozone season (September 30).

Should it be determined through the warning level study that action is necessary to reverse the noted trend, the procedures for control selection and implementation outlined under “action level response” shall be followed.

Action Level Response
An action level response shall be prompted whenever a two (2) year average fourth high monitored value of 85 ppb occurs within the maintenance area. In the event that the action level is triggered and is not due to an exceptional event, malfunction, or noncompliance with a permit condition or rule requirement, Ohio EPA will determine additional control measures needed to assure future attainment of NAAQS for ozone. In this case, measures that can be implemented in a short time will be selected in order to be in place within eighteen (18) months from the close of the ozone season that prompted the action level.

Control Measure Selection and Implementation

Adoption of any additional control measures is subject to the necessary administrative and legal process. This process will include publication of notices, an opportunity for public hearing, and other measures required by Ohio law for rulemaking by state environmental boards.

If a new measure/control is already promulgated and scheduled to be implemented at the federal or state level, and that measure/control is determined to be sufficient to address the upward trend in air quality, additional local measures may be unnecessary. Furthermore, Ohio will submit to U.S. EPA an analysis to demonstrate the proposed measures are adequate to return the area to attainment.

Requirement 3 of 4:

A list of potential contingency measures that would be implemented in such an event.

Demonstration:

Contingency measures to be considered will be selected from a comprehensive list of measures deemed appropriate and effective at the time the selection is made. The selection of measures will be based on cost-effectiveness, emission reduction potential, economic and social considerations or other factors that Ohio EPA deems appropriate. Ohio EPA will solicit input from all interested and affected persons in the maintenance area prior to selecting appropriate contingency measures. Because it is not possible at this time to determine what control measure will be appropriate at an unspecified time in the future, the list of contingency measures outlined below is not comprehensive.

1) Lower Reid vapor pressure gasoline program.

2) Tighten RACT on existing sources covered by U.S. EPA Control Technique Guidelines issued in response to the 1990 CAA.

3) Apply RACT to smaller existing sources.

4) One or more transportation control measures sufficient to achieve at least half a percent reduction in actual area wide VOC emissions. Transportation measures will be selected from the following, based upon the factors listed above after consultation with affected local governments:

   a) trip reduction programs, including, but not limited to, employer-based transportation management plans, area wide rideshare programs, work schedule changes, and telecommuting;

b) traffic flow and transit improvements;

c) other new or innovative transportation measures not yet in widespread use that affects state and local governments deemed appropriate.

5) Alternative fuel and diesel retrofit programs for fleet vehicle operations.

6) Controls on consumer products consistent with those adopted elsewhere in the United States.

7) Require VOC or NO_x emission offsets for new and modified major sources.

8) Require VOC or NO_x emission offsets for new and modified minor sources.

9) Increase the ratio of emission offsets required for new sources.

10) Require VOC or NO_x controls on new minor sources (less than 100 tons).

No contingency measure shall be implemented without providing the opportunity for full public participation during which the relative costs and benefits of individual measures, at the time they are under consideration, can be fully evaluated.

Requirement 4 of 4:
A list of VOC and NO_x sources potentially subject to future controls.

Demonstration:
The following is a list of VOC and NO_x sources potentially subject to future controls.

NO_x RACT

- EGUs
- asphalt batching plants
- industrial/commercial and institutional boilers
- process heaters
- internal combustion engines
- combustion turbines
- other sources greater than 100 tons per year

VOC RACT

- consumer products
- architectural and industrial maintenance coatings
- stage I gasoline dispensing facilities (including pressure valves)
- automobile refinishing shops
- cold cleaner degreasers
- portable fuel containers
- synthetic organic compound manufacturing
- organic compound batch processes
- wood manufacturing
- industrial wastewater
- aerospace industry
- shipbuilding
- bakeries
- plastic parts coating
- volatile organic liquid storage
- industrial solvent cleaning
- offset lithography
- industrial surface coating
- other sources greater than 50 tons per year

CHAPTER SEVEN

PUBLIC PARTICIPATION

Ohio will publish a notification for a public hearing and solicitation for public comment concerning the draft redesignation petition and maintenance plan in ~~several~~a widely distributed ~~publications 30 days prior to~~newspaper in the ~~public hearing~~area.

The public hearing to receive comments on the redesignation request ~~will be~~was held on ~~July 27, 2006,~~November 8, 2012 at ~~the~~189 25th St. NW Canton, Ohio ~~University-Eastern Branch Shannon Hall Room 218, located at 45425 National Road, St. Clairsville, Ohio.~~. The public comment period ~~will close~~closed on ~~July 28, 2006.~~November 8, 2012. No comments were received during the public comment period and no testimony was provided at the hearing. Appendix D ~~will include~~includes a copy of the public notice~~, certifications of publication, and the~~ and hearing transcript ~~from the public hearing.~~.

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CHAPTER EIGHT

CONCLUSIONS

The Stark County basic nonattainment area has attained the NAAQS standard and complied with the applicable provisions of the 1990 Amendments to the CAA regarding redesignations of basic ozone nonattainment areas. Documentation to that effect is contained herein. Ohio EPA has prepared a state implementation and maintenance plan that meets the requirement of Section 110 (a)(1) of the 1990 CAA.

Ohio has performed an analysis that shows the air quality improvements are due to permanent and enforceable measures. In addition, significant regional NO_x reductions will ensure continued compliance (maintenance) with the standard and that all CAA requirements necessary for redesignation have been met.

Based on this presentation, the Stark County ozone basic nonattainment area meets the requirements for redesignation under the CAA and U.S. EPA guidance. Furthermore, because this area is subject to significant transport of pollutants, significant regional NO_x reductions will ensure continued compliance (maintenance) with the standards with an increasing margin of safety.

The State of Ohio hereby requests that the Stark County ozone basic nonattainment area be redesignated to attainment simultaneously with U.S. EPA approval of the Ohio state implementation and Maintenance Plan provisions contained herein.

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