

2008 Eight-Hour Ozone Redesignation Request and Maintenance Plan for Crittenden County, Arkansas

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List of Acronyms and Abbreviations

ADEQ	Arkansas Department of Environmental Quality
AQS	Air Quality System
AR	Arkansas
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CFR	Code of Federal Regulations
CSAPR	Cross-State Air Pollution Rule
EGUs	electric generating units
EPA	United States Environmental Protection Agency
FIP	Federal Implementation Plan
FR	Federal Register
g/bhp-hr	gram(s) per brake-horsepower-hour
hp	horsepower
MATS	Mercury and Air Toxic Standards
MDEQ	Mississippi Department of Environmental Quality
MOA	Memorandum of Agreement
MOVES2014	Motor Vehicle Emissions Simulator (Latest version of 2014)
MS	Mississippi
MSA	Metropolitan Statistical Area
MVEB	Motor Vehicle Emissions Budget
NAAQS	National Ambient Air Quality Standard
NMOG+NO _x	non-methane organic gas and nitrogen oxides
NO _x	nitrogen oxides
PM	particulate matter
ppm	part(s) per million
RACT	Reasonable Available Control Technology
SCHD	Shelby County Health Department
SIP	State Implementation Plan
TN	Tennessee
tpy	ton(s) per year
VOC	volatile organic compound

1. Introduction

The State of Arkansas, through the Arkansas Department of Environmental Quality (ADEQ), requests that Crittenden County, Arkansas, be redesignated to attainment for the 2008 National Ambient Air Quality Standard (NAAQS) for ground-level ozone.

Section 107(d)(3) of the Clean Air Act (CAA) specifies the requirements for redesignation of nonattainment areas. A primary guidance relied on in preparing and processing redesignation requests is a 1992 Environmental Protection Agency (EPA) memorandum issued by the then Director of the EPA's Air Quality Management Division, John Calcagni, titled "Procedures for Processing Requests to Redesignate Areas to Attainment" (the Calcagni memo). This petition generally follows the format of the Calcagni memo. The key portion of the memo is recited below:

"The Administrator may not promulgate a redesignation of a nonattainment area (or portion thereof) to attainment unless —

- (1) the Administrator determines that the area has attained the national ambient air quality standard;*
- (2) the Administrator has fully approved the applicable implementation plan for the area under section 110 (k);*
- (3) the Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable Federal air pollutant control regulations and other permanent and enforceable reductions;*
- (4) the State containing such area has met all requirements applicable to the area under section 110 and part D of title I of the CAA...:and*
- (5) the Administrator has fully approved a maintenance plan for the area as meeting the requirements of section 175a.*

Air quality data show that as of 2014 all area ozone monitors within the Memphis, TN-MS-AR Metropolitan Statistical Area (MSA) are now registering design values below the 2008 ozone NAAQS of 0.075 parts per million. For this reason, the area is eligible to petition EPA for a redesignation to attainment. ADEQ has been in contact with State air agencies, local transportation planners and the EPA during the development of this petition. Due to significant differences in population, industrial development, transportation planning and political boundaries, a decision was made that each state would develop its own petition. While it is in the best interest for the entire area to be redesignated to attainment, we ask EPA to evaluate each petition on its own merits such that a deficiency in one petition which can be determined to have no relevant effect in the other two jurisdictions will not delay processing of the other petitions.

This request meets the criteria for redesignation and also contains the maintenance plan for Crittenden County, Arkansas. The maintenance plan describes how Crittenden County will maintain compliance with the ozone standard for at least ten years after formal redesignation of the area to attainment by the EPA. ADEQ requests that the EPA simultaneously process and review both the redesignation request and the adequacy of the maintenance plan.

2. Background & Air Quality Status

Crittenden County, Arkansas, shares a common border with Shelby County, Tennessee, separated only by the Mississippi River. Along with DeSoto County, Mississippi, these three counties are considered central counties of the Memphis, TN-MS-AR MSA. At the time of area designation for the 2008 eight-hour ozone standard, the MSA also included Marshall, Tate and Tunica Counties in Mississippi, and Fayette and Tipton Counties in Tennessee. The MSA has since expanded to include Benton County, Mississippi.

According to the United States Census Bureau, the Memphis, TN-MS-AR MSA population was approximately 1.3 million in 2012. The majority of the MSA population resides in Shelby County, Tennessee, which reported a population of 927,644, and is mostly urbanized. Crittenden County reported a population of approximately 50,021 and is mostly rural, except for a small area on the east side of the county that borders Shelby County, Tennessee. With the exception of a small urbanized portion south of Shelby County, Tennessee, in DeSoto County, Mississippi, the remainder of the MSA is almost completely rural. The population for counties in the Memphis, TN-MS-AR MSA can be found in Table 1.

Table 1. County-Level Population for the Memphis, TN-MS-AR MSA

County	2010 Decennial Census	2012 Annual Estimate
Crittenden County, AR	50,902	50,021
Benton County, MS	8,729	8,727
DeSoto County, MS	161,252	166,234
Marshall County, MS	37,144	36,612
Tate County, MS	28,886	28,490
Tunica County, MS	10,778	10,475
Fayette County, TN	38,413	38,659
Shelby County, TN	927,644	940,764
Tipton County, TN	61,081	61,705
Total Population	1,324,829	1,341,687

2.1. State and Local Air Ozone Monitoring Network

Within the Memphis, TN-MS-AR MSA, ground-level ozone is routinely measured at five locations as shown in Figure 1. ADEQ operates one monitor (Marion, AQS ID 05-035-0005) in Crittenden County, located 10 miles northwest of downtown Memphis in Marion, Arkansas. Mississippi Department of Environmental Quality operates one monitor (Hernando, AQS ID 28-033-0002) in DeSoto County, Mississippi, located 25 miles south of downtown Memphis in Hernando, Mississippi. Shelby County Health Department operates the remaining three monitors (Frayser, AQS ID 47-157-0021; Shelby Farms, AQS ID 47-157-0075; and Orgill, AQS ID 47-157-1004) in Shelby County, Tennessee.

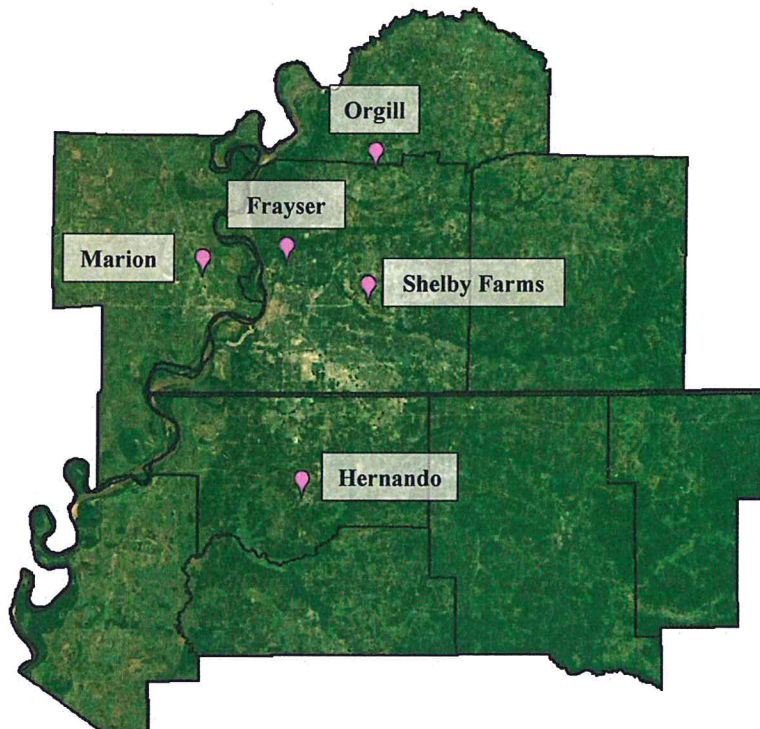


Figure 1. Ozone Monitors in the Memphis, TN-MS-AR MSA

2.2 Eight-Hour Ozone NAAQS and Area Designation History

In 1997, EPA finalized a revised ozone standard, replacing the previous one-hour standard with an eight-hour standard set at 0.08 parts per million (ppm). EPA designated Crittenden County, along with Shelby County, Tennessee, as a moderate nonattainment area. The State of Arkansas and the State of Tennessee successfully petitioned to EPA for downward classification of the nonattainment area to marginal nonattainment (69 FR 56697, September 22, 2004). In 2008, Crittenden County was reclassified to moderate nonattainment after failing to meet the 2007 attainment deadline (73 FR 16547, March 28, 2008). Crittenden County was redesignated to attainment for the 1997 eight-hour standard on March 24, 2010.

In 2008, the EPA set the eight-hour ozone standard at 0.075 ppm. Based on ozone data collected during the 2007–09 ozone seasons, EPA designated Crittenden County as a marginal nonattainment for the 2008 eight-hour ozone NAAQS. Shelby County, Tennessee, and a portion of DeSoto County, Mississippi were also designated marginal nonattainment in the Memphis, TN-MS-AR MSA. This nonattainment designation was effective July 20, 2012, with an attainment date of no later than December 31, 2015 (77 FR 30160, May 21, 2012).

2.3 Air Quality Status

Attainment of the eight-hour ozone standard is based on the design value for a given area. The eight-hour ozone design value for a given site is the three-year average of the annual fourth highest eight-hour ozone concentration at that site. A monitor must have 75% of the valid days in the ozone season for each year and an average of 90% for the three year period. A valid day is defined as having at least 75% of the possible eight-hour averages in the day; however, a day can be considered valid if the daily maximum is greater than the level of the standard.

Ozone monitoring data for the period of 2012 through 2014 show that Crittenden County has attained the 2008 eight-hour ozone standard. In addition, all other regulatory monitors in the tri-state Memphis, TN-MS-AR nonattainment area have also attained the 2008 eight-hour ozone standard during the same period. Monitoring data for 2014 have undergone quality assurance and have been certified by and submitted to EPA's Air Quality System (AQS) database. This meets the requirements of CAA § 107(d)(3)(E)(i). The design values for each site for the three-year period ending in 2008 through 2014 are listed in Table 2 and shown graphically in Figure 2. The eight-hour design values for all five monitors show an overall decrease in ground-level ozone, with a slight increase in the design value for the three year period ending in 2011 and 2012 for four monitors. In addition, the design value for the year ending in 2014 is at such a level as to allow a safety margin moving into the 2015 ozone monitoring season. For the area to record a violation of the 2008 standard, monitors would have to record an ozone level that has not occurred since 2005 in which the fourth maximum eight-hour ozone concentration was above 0.090 ppm.

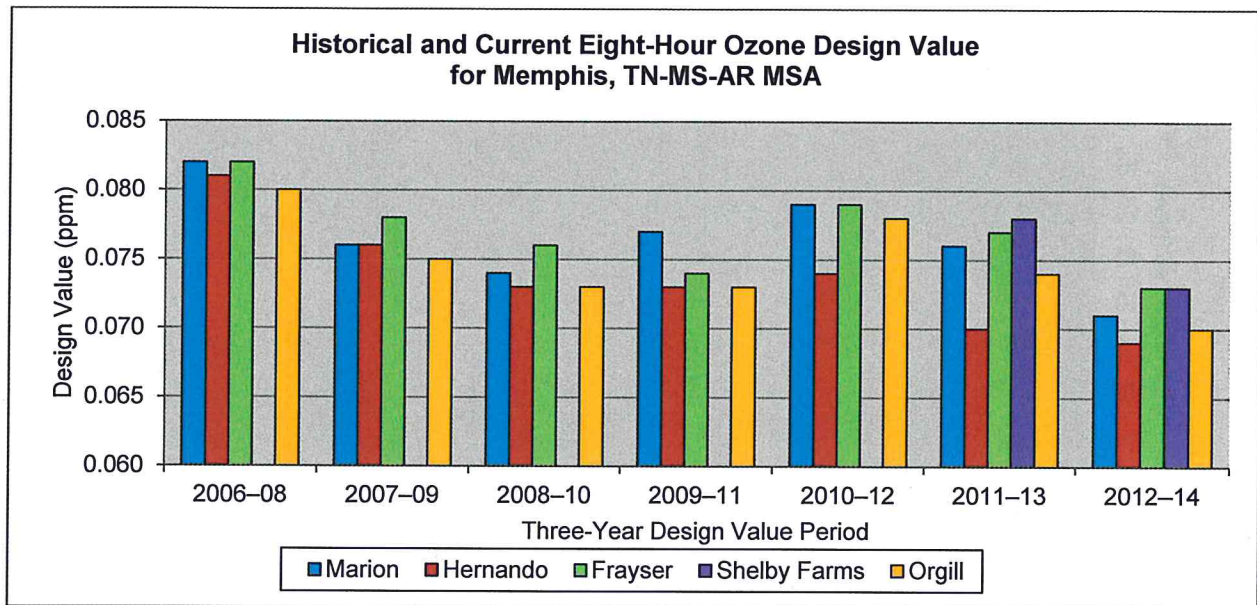


Figure 2. Chart of Eight-Hour Ozone Design Value for Monitors in the Memphis, TN-MS-AR MSA

NOTE: The Shelby Farms monitor (47-157-0075) began operation in 2011 and therefore did not have a valid design value until the three year period of 2011–13.

Table 2. Eight-Hour Ozone Design Values for the Three-Year Period Ending in 2008 through 2014 in the Memphis, TN-MS-AR MSA

Name	Three-Year Design Value Period						
	2006–08	2007–09	2008–10	2009–11	2010–12	2011–13	2012–14
Marion	0.082	0.076	0.074	0.077	0.079	0.076	0.071
Hernando	0.081	0.076	0.073	0.073	0.074	0.070	0.069
Frayser	0.082	0.078	0.076	0.074	0.079	0.077	0.073
Shelby Farms	--	--	--	--	--	0.078	0.073
Orgill	0.080	0.075	0.073	0.073	0.078	0.074	0.070

NOTE: The Shelby Farms monitor (47-157-0075) began operation in 2011 and therefore did not have a valid design value until the three year period of 2011–13.

The same trend can also be found in the number of exceedance days in Figure 3. In 2006, the Marion monitor had 13 days in which the eight-hour ozone was above the standard. That number decreased from 2007 through 2009, increased slightly in 2010 and 2011, and has decreased since 2012. In 2013 and 2014, the Marion monitor did not show an exceedance of the standard.

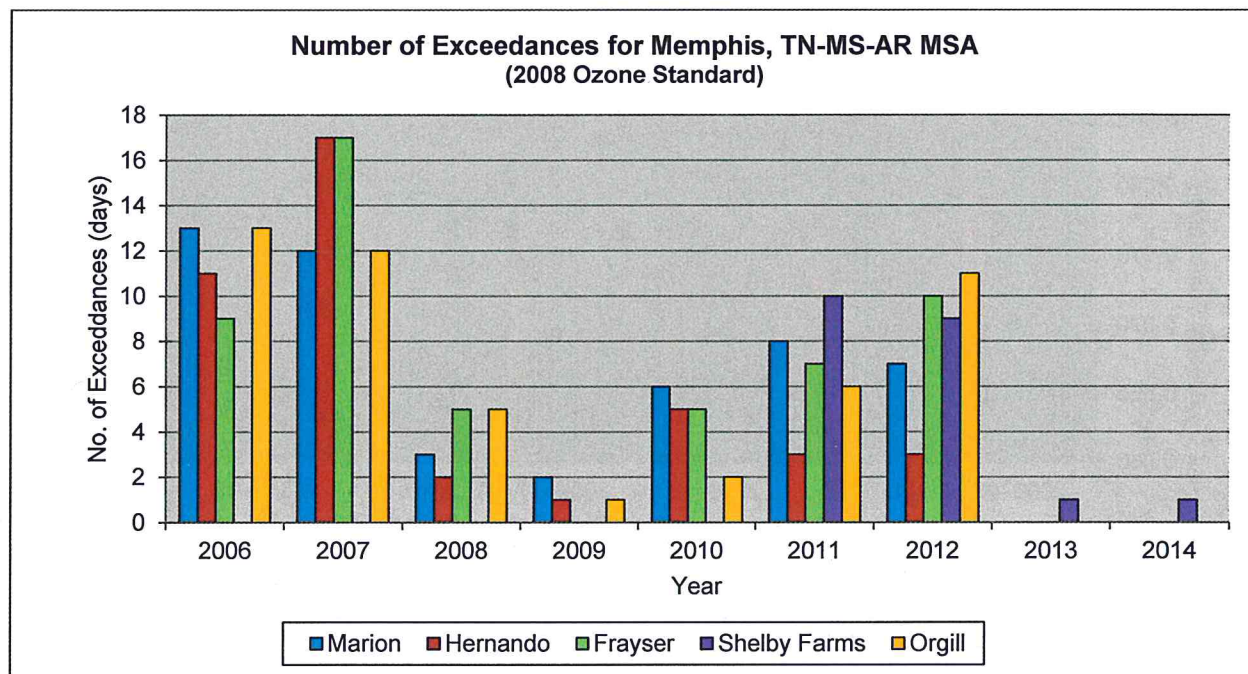


Figure 3. Number of Exceedances by Monitor in the Memphis, TN-MS-AR MSA

NOTE: The Shelby Farms monitor (47-157-0075) began operation in 2011 and therefore did not have a valid design value until the three year period of 2011–13.

3. Permanent and Enforceable Reductions in Emissions

Pursuant to § 107(d)(3)(E)(iii) of the CAA, nonattainment areas must show improvement in air quality due to permanent and enforceable reductions in emissions in order to be redesignated to attainment:

“...the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable Federal air pollutant control regulations and other permanent and enforceable reduction.”

Measured reductions in ozone in and around Crittenden County, Arkansas, are largely attributable to reductions from emission sources of volatile organic compounds (VOCs) and nitrogen oxides (NO_x), which are precursors in the formation of ground-level ozone. The majority of these reductions have been realized from federal measures related to mobile sources and electrical power generation. In addition, continuing new emissions control programs will help to ensure a further decrease in emissions throughout the area in the future.

3.1 On-Road Mobile Sources

Inventory analysis shows that on-road mobile sources contribute a significant amount of NO_x emissions in the area. On-road mobile sources consist of passenger cars, passenger trucks, motorcycles, buses, heavy-duty trucks, and other motor vehicles traveling on public roadways.

3.1.1 Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control

The EPA finalized the Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control requirements in February 2000 (65 FR 6698, February 10, 2000). The Tier 2 standard covers passenger vehicles with a gross vehicle weight rating of more than 8,500 pounds (such as larger pickups and sport utility vehicles), which were not covered by the Tier 1 regulations. The Tier 2 standard was phased in between 2004 and 2009. The tailpipe emissions standards of Tier 2 requires manufacturers to achieve an average NO_x tailpipe standard of 0.07 grams per mile (gpm), a 75% reduction from the 0.30 gpm previous standard. This means that manufacturers are allowed to produce vehicles with a range of emissions, but the mix of vehicles a manufacturer sells each year must have average NO_x emissions below a 0.07 gpm. In addition, under the gasoline sulfur standard, most refiners will have to produce gasoline that averages no more than 30 ppm of sulfur. Sulfur can interfere with operations of catalytic converters in vehicles and thus cause higher NO_x emissions. When fully implemented, the Tier 2 standards are expected to reduce NO_x emissions by about 74 percent by 2030.

3.1.2 Tier 3 Motor Vehicle Emissions and Fuel Standards

Future year VOC and NO_x reductions will also be realized from EPA's Tier 3 Motor Vehicle Emissions and Fuel Standards, finalized in April 2014 (79 FR 23414, April 28, 2014). Under the Tier 3 standard, the tailpipe standard establishes a fleet average non-methane organic gas and nitrogen oxides (NMOG+ NO_x) limit. This standard is to be phased in starting in 2017, with the final NMOG+ NO_x limit set at 30 mg/ml in 2026. The gasoline sulfur standard of Tier 3 also requires federal gasoline to meet an annual average standard of 10 ppm of sulfur by 2017. The tailpipe and gasoline sulfur standard will reduce emissions of VOC and NO_x from on-road mobile sources by 21 percent by 2030. Benefits from the Tier 3 standards will assure continued maintenance of the air quality standard.

3.2 Non-Road Mobile Sources

EPA adopted the Clean Air Non-road Diesel Rule that targets NO_x and particulate matter (PM) emissions from non-road diesel engines in June 2004 (69 FR 38958, June 29, 2004). The rule sets Tier 4 emission standards for NO_x based on the horsepower (hp) ratings of non-road engines. The NO_x emission standard set by the Tier 4 is as follow: for engines less than 25 hp, the final emission standard would be set at the previously-set 5.6 grams per brake-horsepower-hour (g/bhp-hr); for engines of 25 to 75 hp, the standard is set at 3.5 g/bhp-hr; for engines of 75 to 750 hp, the standard is set at 0.30 g/bhp-hr; and for engines of above 750 hp, the standard is set at 0.50 g/bhp-hr for generator set above 1200 hp and 2.6 g/bhp-hr for all other engines above

750 hp. The Tier 4 standards were phased in between 2008 and 2014, with larger mobile engines having an additional year of flexibility to meet the standard.

In addition to the Tier 4 standards, non-road diesel fuel was affected by the rule. Non-road diesel fuel was capped at 500 ppm sulfur in 2007. Sulfur was capped to the final 15 ppm level in 2010 for land-based non-road diesel engine fuel; this final cap level was also applied to marine vessels and locomotives in 2012. The ultra-low sulfur fuel requirement makes it possible for manufacturers to use advanced engine-control systems that will reduce PM and NO_x emissions as well.

When the Tier 4 and non-road diesel fuel standards are fully implemented, diesel NO_x emissions are expected to be reduced by 90 percent. This reduction in non-road emissions is critical in reaching attainment for the eight-hour ozone standard for Crittenden County.

3.3 Point Sources

Emissions reductions from industries in Crittenden County contribute to the area's improvement in air quality. Stationary point source emissions data is collected annually from sources that meet reporting requirements outlined in 40 CFR Part 51, Subpart A - Air Emissions Reporting Requirement. These point sources include, but are not limited to, refineries, chemical plants, bulk terminals, and utilities.

In 2010, Trojan Luggage Company/Americo was reclassified from a major source for Title V to a minor source. With this action, allowable VOC emissions decreased by 0.1 tons per year (tpy) due to the modification of inks used at the printer. In addition, two facilities previously permitted to emit VOC had their Title V permit voided and do not have any active air permit: Crittenden County Landfill and Automated Convey Systems. Crittenden County Landfill, previously permitted to emit 55.2 tpy of VOC, had its Title V air permit voided in 2009. Automated Conveyer Systems, previously permitted to emit 84.0 tpy of VOC, had its Title V air permit voided in 2010.

The Mercury and Air Toxic Standards (MATS) were promulgated by EPA on February 16, 2012, regulating the emissions of mercury, acid gases, and mercury metallic toxic pollutants from new and existing coal and oil-fired electricity generating units (EGUs) (77 FR 9304, February 16, 2012). Although not targeted at NO_x emissions, the MATS rule is expected to result in additional NO_x reduction nationwide due to its impact on older coal-fired units. In Arkansas, the Entergy White Bluff and Independence facilities are in the process of seeking permits for environmental controls to ensure MATS compliance (see White Bluff Draft Permit 0263-AOP-R8 and Independence Draft Permit 0449-AOP-R8. The MATS standard is expected to be fully implemented in 2016.

3.4 Area Sources

Additional area source VOC emissions reductions were likely realized during this period due to federal controls on architectural coatings, roadway paints, auto body refinishing, manufacturing, and other commercial and consumer solvent products. These reductions were not quantified in the development of this plan.

3.5 Voluntary Efforts

In addition to mandatory controls, several entities and organizations within Crittenden County are already significantly involved in matters concerning the county's nonattainment status including municipal and county governments, the local transportation planning organization, and the local legislative delegation. Likewise, the local business community and the county Farm Bureau organization have been keenly interested in air quality issues. These non-regulatory controls indicate a commitment to achieving reductions utilizing more than just required controls. Among the activities already undertaken as part of joint public-private campaigns to improve air quality are:

- Truck stop electrification;
- Use of alternative fuels (biodiesel) by governmental fleets;
- Installation of Intelligent Transportation System devices to reduce congestion;
- Establishment of "Park and Ride" carpool lot locations;
- Public transportation network improvements in West Memphis; and
- Consultation with the Port of West Memphis and Port of Memphis to determine what, if any, reductions in emissions can be effected at those facilities.

In addition, the Arkansas Energy Office reopened the Arkansas Gaseous Fuels Rebate Program in January 2015, with approximately \$1.2 million in rebates that will be administered for new refueling stations or the retrofitting of existing refueling stations in Arkansas that provide public access to clean burning motor fuels. The Arkansas Energy Office also announced \$115,000 in rebates for their Clean Fuel Vehicle Rebate Program, in which fleet owners can apply for either conversion or purchase of a compressed natural gas/propane fleet. These two programs will further reduce emissions of both VOC and NO_x from the transportation sector.

3.6 Clean Air Interstate Rule and Cross-State Air Pollution Rule

Beginning with the 2015 ozone season, the Clean Air Interstate Rule (CAIR) has been replaced by CSAPR in Arkansas. EPA estimates that CSAPR and other federal rules will reduce NO_x emissions by 1.4 million tons per year (tpy), including 340,000 tpy of NO_x during the ozone season. Under CSAPR, Arkansas is subject to the seasonal NO_x program to reduce NO_x emissions. The annual NO_x trading budget for Arkansas is set at 15,110 tons.

4. Clean Air Act Section 110 and Part D Requirements

4.1 Emissions Statements

CAA section 182(a)(3)(B) calls for the SIP to require that owners or operators of each stationary source of NOX and VOC in an ozone non-attainment area submit an annual emissions statement. The emissions statement must show the actual emissions of NOX or VOC and contain a certification that the information contained in the statement is accurate to the best knowledge of the individual certifying the statement.

Arkansas Pollution Control and Ecology Commission (APC & EC) Regulation 19, Chapter 7 (Sampling, Monitoring, and Reporting Requirements) requires emissions statements. Regulation 19.705(D) states, “Each emission inventory is to be accompanied by a certifying statement, signed by the owner(s) or operator(s) and attesting that the information contained in the inventory is true and accurate to the best knowledge of the certifying official. The certification shall include the full name, title, signature, date of signature, and telephone number of the certifying official.” This revision is a statewide rule, applying to all counties in Arkansas, not just Crittenden County. By requiring the owner or operator of each stationary source to submit annual statements of emissions of NOX and VOCs, APC & EC Regulation 19.705 meets the requirements of CAA section 182(a)(3)(B).

The emissions statements requirements in APC & EC Regulation 19.705 were approved by the EPA on January 15, 2009 (**Federal Register** /Vol. 74, No. 10 /Thursday, January 15, 2009).

4.2 Nonattainment New Source Review

Arkansas APC & EC Regulation No. 31 - Nonattainment New Source Review Requirements, Effective Date: May 28, 2006 was approved by EPA April 12, 2007 (72 FR 18394) effective May 14, 2007. Following redesignation, Crittenden County, AR will be subject to PSD permitting requirements under Arkansas Regulation No. 19. Regulations of the Arkansas Plan of Implementation For Air Pollution Control.

4.3 Emissions Inventory

The emissions inventory information for Crittenden County is contained in section 5.1 of this document.

5. Maintenance Plan

The CAA requires States to submit an approved maintenance plan prior to redesignation, pursuant to CAA § 107(d)(3)(E)(iv) and CAA § 175A. Section 175A of the CAA states:

“Each State which submits a request under section 7407(d) of this title for redesignation of a nonattainment area for any air pollutant as an area which has attained the national primary ambient air quality standard for that air pollutant shall also submit a revision of the applicable State implementation plan to provide for the maintenance of the national primary ambient air quality standard for such air pollutant in the area concerned for at least 10 years after the redesignation. The plan shall contain such additional measures, if any, as may be necessary to ensure such maintenance.”

The following sections demonstrate maintenance of the 2008 eight-hour ozone NAAQS throughout the maintenance period. The maintenance plan time frame will cover at least ten years after redesignation. Section 107(d)(3)(D) grants the Administrator up to 18 months from receipt of a complete submittal to process the redesignation request; therefore, ADEQ has developed this maintenance plan for the time frame of May 1, 2015 through January 31, 2027, a period of twelve years and nine months. States must continue to provide for maintenance of the standard for an additional ten years after the expiration of the initial ten year period, with a maintenance plan revision to be submitted to EPA eight years after redesignation. At such time as required, ADEQ will prepare and submit a revised plan demonstrating on-going maintenance for Crittenden County, Arkansas.

5.1 Emissions Inventory

An emissions inventory was prepared using a base-year of 2011, estimating base-year NO_x and VOC emissions for Crittenden County. Table 3 summarizes the 2011 VOC and NO_x emissions totals by source categories. The source categories include: on-road mobile, non-road mobile, point, and area sources. The detailed emission inventory information for Crittenden County is provided in Appendix A. Methodology used to prepare the projected future year emissions is provided in Appendix B.

Table 3. 2011 Emissions Inventory Summary for Crittenden County, Arkansas

Category	Daily Ozone NO _x (tons/day)	Annual NO _x (tons/year)	Daily Ozone VOC (tons/day)	Annual VOC (tons/year)
On-Road Mobile	6.80	2,542	2.42	845
Non-Road Mobile	2.11	582.63	3.66	881.35
Point	0.0017	0.63	0.51	186.84
Area	8.70	3,165.17	24.90	8,868.94
Total	17.61	6,290.43	31.49	10,782.13

Table 4. Base Year 2012 and Future Year Projections for 2017, 2020, and 2027 Emissions Inventory

Summer Season Tons per Day						
Crittenden County Volatile Organic Compounds Emission Inventory						
Type	Year	Area	Non-Road	On-Road	Point	Total
Base Year	2012	7.90	3.26	2.35	0.78	14.29
Projection	2017	7.57	2.27	1.55	0.73	12.12
Projection	2020	7.46	2.03	1.39	0.68	11.56
Projection	2027	7.15	1.36	0.98	0.53	10.01
Crittenden County Nitrogen Oxides Emission Inventory						
Type	Year	Area	Non-Road	On-Road	Point	Total
Base Year	2012	3.22	1.97	13.04	3.65	21.88
Projection	2017	2.85	1.48	9.48	3.08	16.89
Projection	2020	2.65	1.28	7.68	2.87	14.48
Projection	2027	2.10	0.73	5.18	2.26	10.27

5.2 Motor Vehicle Emissions Budget

The transportation conformity rule found in 40 CFR Part 93 requires specific emission budgets to be defined for the on-road mobile sources portion of the Crittenden County emission inventory. These budgets are used to assure that any transportation plans, programs, and projects are consistent with and conform to, the maintenance of acceptable air quality in Crittenden County.

Per 40 CFR 93.101, “*Safety Margin* means the amount by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for reasonable further progress, attainment, or maintenance.” Therefore, eighty percent (80%) of the available on-road Safety Margin was allocated to the on-road 2027 projections. The calculated Safety Margins applied to the 2027 MVEBs for VOCs and NO_x are presented below in Table 5.

Table 5. MOVES2014-established on-road emissions and MVEB Calculations for NO_x and VOC

Motor Vehicle Emissions Budget and Safety Margin (Tons per Day)								
Year	MOVES2014-established On-road MVEB		On-Road Safety Margin (Total Available)		On-road Safety Margin Applied to 2027 MVEB (80% of Total Available)		Total On-road MVEB (MOVES2014 + 80% of Safety Margin)	
	NO _x	VOC	NO _x	VOC	NO _x	VOC	NO _x	VOC
2012	13.04	2.35	N/A	N/A	N/A	N/A	N/A	N/A
2027	5.18	0.98	7.86	1.37	6.29	1.10	11.47	2.08

Motor vehicle emission budgets (MVEB) for VOCs and NO_x are presented in Table 6. The MVEBs for Crittenden County are consistent with the plan for maintaining total emissions from all source categories at or below the 2012 and 2027 VOC and NO_x emission levels.

Table 6. On-road Motor Vehicle Emissions Budget (MVEB)

Year	NO_x (tons/day)	VOC (tons/day)
2012	13.04	2.35
2027	11.47	2.08

5.3 Continued Operation of State and Local Ozone Monitoring Network

The existing ozone monitoring network within the Memphis MSA will continue to be operated in its present configuration. Any changes to the present configuration will be in accordance with the Memorandum of Agreement (MOA) finalized on June 20, 2008 between the Arkansas Department of Environmental Quality, Shelby County Health Department, and the Mississippi Department of Environmental Quality. In addition, any potential changes to the monitoring network will be discussed with EPA. This MOA is in accordance with § 2(e) of 40 CFR Part 58 Appendix D. The MOA can be found in Appendix D.

5.4 Verification of Continued Attainment

Verification of continued attainment can be accomplished through air quality data and source emission data. Air quality data will provide information as to whether the eight-hour ozone standard is being met in real-time and over specified averaging periods. Emissions data will be used to develop periodic updates to the emissions inventory.

In order to track progress of the maintenance plan, an emissions inventory of actual emissions for Crittenden County will be performed using the latest emission factors, models, and methodologies to include area, non-road mobile, on-road mobile, and point sources for VOC and NO_x. The point source inventories will be updated on an annual basis and the non-point, on-road mobile, and non-road mobile inventories will be updated every three years.

5.5 Stationary Source Control

Future NO_x reductions through stationary source control will be realized through implementation of CSAPR. All three states in the Memphis, TN-MS-AR MSA are required to participate in the CSAPR ozone season NO_x program. The NO_x reductions required by CSAPR are expected to aid in the maintenance of the eight-hour ozone NAAQS in the area. Beginning with the 2015 ozone season, CAIR has been replaced by CSAPR in Arkansas.

5.6 Voluntary Measures

In addition to the mandatory controls, the State of Arkansas, Crittenden County, and other entities in the Memphis, TN-MS-AR MSA will continue to research and implement voluntary measures that improve the area's air quality.

ADEQ will continue to participate with the Shelby County Health Department and the Mississippi Department of Environmental Quality in ozone advisories for the Memphis, TN-MS-AR MSA. Ozone advisories are issued to alert citizens to unhealthy air quality forecasts and encourage them to take actions to avert such episodes.

Arkansas Forestry Commission oversight of voluntary measures described in the Arkansas Smoke Management Plan assures that smoke from prescribed fires is managed such that the smoke's impact on people and the environment is minimized.

5.7 Contingency Provisions

Each maintenance plan submitted to EPA requires contingency provisions to assure any violation of the standard after redesignation would be corrected.

Triennial reviews of actual emissions for Crittenden County will be performed using the latest emission factors, models, and methodologies. ADEQ will re-project emissions if any of the assumptions used for development of this maintenance plan appear to have changed substantially. If these periodic emissions inventory updates reveal excessive or unanticipated growth greater than ten percent in ozone precursors, and if a measured exceedance of the 2008 eight-hour ozone design value is measured in any portion of the maintenance area, ADEQ will evaluate whether additional emission reduction measures should be implemented as a means of assuring continued maintenance of the standard. ADEQ will coordinate these efforts, as appropriate, with Shelby County Health Department and the Mississippi Department of Environmental Quality. The investigation will last no longer than three months and the results will be reported to EPA.

A violation of the standard occurs when, at the conclusion of state and federal quality assurance and quality control procedures, certified monitoring data confirms a three-year average, eight-hour design value greater than 0.075 ppm at any ozone monitoring site located within the nonattainment area. Should a violation of the standard occur, ADEQ will perform a review, in consultation with the Shelby County Health Department and the Mississippi Department of Environmental Quality, to address the probable causes of the violation. ADEQ commits to adopt and implement, to the extent considered necessary, regulations for any of the following contingency measures as expeditiously as practicable, but no later than 24 months. ADEQ will also submit rules implemented the adopted contingency measures to EPA as a State Implementation Plan (SIP) revision within the same timeframe.

ADEQ will consider one or more of the following contingency measures to re-attain the standard:

- Reasonable Available Control Technology (RACT) for VOC and NO_x sources;
- Anti-idling ordinances;
- Open burning restrictions during peak ozone season;
- Diesel retrofit/replacement incentives;
- Programs or incentives to decrease motor vehicle use;
- Trip reduction ordinances;
- Implementation of a program to require additional emissions reductions from stationary sources;
- Implementation of a program to enhance inspection of stationary sources to ensure emissions control equipment is functioning properly;
- Implementation of fuel programs, including incentives for alternative fuels;
- Employer-based transportation management plans, including incentives;
- Programs to limit or restrict vehicle use in downtown areas, or other areas of high emissions concentration, particularly during periods of peak use;
- Programs for new construction and major reconstruction of paths for use by pedestrians or by non-motorized vehicles when economically feasible and in the public interest;
- Other currently unspecified control measures that might prove to be advantageous.

6. Public Process

The legal authority for the State of Arkansas to adopt and implement the maintenance plan SIP is found in Arkansas Code Annotated § 8-4-311. Public review of this redesignation request and maintenance plan is consistent with 40 CFR Part 51. Notice of availability of the complete document and a date for a public hearing was published in a statewide newspaper on October 16, 2015. The public hearing was held on November 5, 2015. A copy of the public notice, proof of publication and hearing record are included in Appendix E. Comments received and responses from the Department are included in Appendix F.

7. Conclusion

Air quality monitoring data and a review of ozone precursor pollutant emissions inventories indicates that Crittenden County, Arkansas, is attaining the 2008 eight-hour ozone standard. Ozone concentration continues to decline as a result of permanent and enforceable reductions. Crittenden County is capable of maintaining the standard for the duration of this plan. Adherence to the maintenance plan provides assurances that air quality can be maintained in the long-term. Arkansas is therefore petitioning EPA for redesignation of Crittenden County, Arkansas, from nonattainment to attainment of the 2008 eight-hour ozone standard.

Appendix A

Crittenden County 2011 Emission Inventory



Crittenden County NO_x, VOC & CO
Base Year Emission Inventory

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INTRODUCTION

A. BACKGROUND

This document represents the 2008 8-Hour Ozone State Implementation Plan (SIP) emissions inventory for Crittenden County, Arkansas and includes emission data for NO_x, VOCs and CO as required by the Clean Air Act Amendments (CAAA) of 1990. The Clean Air Act of 1970 and the Clean Air Act Amendments of 1990 both contain provisions for the attainment and maintenance of National Ambient Air Quality Standards (NAAQS) for criteria pollutants. The CAAA requires revision of existing plans in states containing areas designated as nonattainment prior to 1990 and also requires development of new plans in newly designated nonattainment areas.

On March 12, 2008, the United States Environmental Protection Agency (EPA) lowered the eight-hour ozone NAAQS from 0.08 parts per million (ppm) to 0.075 ppm. Under the 0.075 ppm (75 parts per billion) standard, the EPA designated the Memphis TN-MS-AR area, as nonattainment with a marginal classification. Crittenden County, Arkansas is located within this nonattainment area. The CAAA requirements are very specific and vary in accordance with the severity of the particular area's air pollution problem. Section 182(a)(1) of the CAAA requires states with nonattainment areas to submit a comprehensive and accurate inventory of ozone precursor emissions from all sources within two years of the effective date of designation, which was July 20, 2012. EPA's proposed 40 Code of Federal Regulations §51.1115, specified that states use 2011 as a base year in the proposed implementation rule for the 2008 eight-hour ozone NAAQS.

Enclosed is the base year 2011 emission inventory for Crittenden County, Arkansas which was classified as "marginal" by the EPA. For marginal ozone nonattainment areas, three pollutants must be inventoried: oxides of nitrogen (NO_x); volatile organic compounds (VOCs); and carbon monoxide (CO). Air Emissions Reporting Requirements (AERR) Rule submittals every three years thereafter will be used to satisfy the periodic EI requirements.

B. EMISSIONS SUMMARY

The agency directly responsible for the preparing and submitting the 2008 Ozone SIP Emissions Inventory was the Arkansas Department of Environmental Quality (ADEQ). The 2011 EI of NO_x, VOCs and CO for Crittenden County was created from four general categories of emissions sources: point, area, on-road mobile, and non-road mobile.

The annual emissions for NO_x, VOCs and CO are estimated in tons per year (tons/year) and ozone season daily emissions are estimated in tons per day (tons/day). Daily emissions are estimated for the typical peak ozone season day. The peak ozone season is defined as that contiguous three-month period of the year during which the highest number of ozone exceedances have occurred over the past three years. The months of June, July, and August were selected for Crittenden County. Peak ozone daily emissions represent average emissions that occurred on a typical weekday during the peak ozone season. All references to daily or seasonal emissions in this document represent peak ozone season daily emissions. In this inventory, NO_x, VOCs and CO emissions sources are categorized into point, area, non-road, on-road and biogenic sources. Peak ozone season daily emissions are estimated for all of these emission source categories. Sources for the area, non-road, on-road, and biogenic categories were developed using the AERR and are based on EPA-generated information for Crittenden County.

Table 1: Summary

Category	Ozone Season Daily NO _x	Annual NO _x	Ozone Season Daily VOC	Annual VOC	Ozone Season Daily CO	Annual CO
Units	tons/day	tons/year	tons/day	tons/year	tons/day	tons/year
Point	0.0017	0.63	0.51	186.84	0.004	1.58
Area	8.70	3,165.17	24.90	8,868.94	20.32	7,375.56
Non-road Mobile	2.11	582.63	3.66	881.35	13.78	3,476.63
On-road Mobile	<u>6.80</u>	<u>2,542</u>	<u>2.42</u>	<u>845</u>	<u>23.13</u>	<u>9,051</u>
Total	<u>17.61</u>	<u>6,290.43</u>	<u>31.49</u>	<u>10,782.13</u>	<u>57.234</u>	<u>19,904.77</u>

SECTION I

AREA SOURCE INVENTORY

Stationary sources that do not meet the reporting requirements for point sources are classified as area sources. Area sources are small-scale industrial, commercial, and residential sources that use materials or perform processes that generate emissions. Area sources can be characterized by the mechanism in which emissions are released into the atmosphere: evaporative or combustion. Evaporative emission sources include the following: oil and gas production facilities, printing processes, industrial coating and degreasing operations, gasoline service station underground tank filling, and vehicle refueling operations. Combustion sources include the following small facilities with less than 100 tons per year of emissions: oil and gas production facilities, stationary source fossil fuel combustion at residences and businesses, outdoor burning, structural fires, and wildfires.

Arkansas accepts EPA emission estimates for the Area Sources category.

The area source inventory includes emitters of ozone precursors (i.e., VOCs and NOx) such as devices that combust fuel (e.g., wood stoves, commercial and industrial boilers), disperse industrial and commercial VOC sources (e.g., dry cleaners, degreasing and industrial surfaces coating), gasoline distribution, off-road mobile sources (planes, trains, and watercraft), fires and open burning (e.g., agricultural burning, structural fires wildfires, prescribed burning). Biogenic sources are also included in this category.

Seasonal Adjustment for Area Source Emissions

Daily emissions (tons per day) for area sources are calculated using the EPA-prescribed method in, “Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone Volume 1: Guidance for Stationary Sources” found at:

http://www.epa.gov/ttn/naaqs/aqmguide/collection/cp2/bakup/19910501_oaqps_epa-450_4-91-016_ei_preparation_stationary_sources.pdf.

Table 2: Area NOx by Sector

Area NOx by Sector	Tons/year	Days/Week	Ozone Season Daily tons/day
Biogenics - Vegetation and Soil	545.17	7	1.498
Bulk Gasoline Terminals	0.63	6	0.002
Fires - Agricultural Field Burning	136.02	7	0.374
Fires - Prescribed Fires	55.10	7	0.151
Fuel Comb - Comm/Institutional - Other	0.01	6	0.00005
Fuel Comb - Residential - Natural Gas	30.80	7	0.085
Fuel Comb - Residential - Oil	0.04	7	0.0001
Fuel Comb - Residential - Other	6.55	7	0.018
Fuel Comb - Residential - Wood	1.77	7	0.005
Miscellaneous Non-Industrial NEC	0.21	6	0.001
Mobile - Aircraft	2.80	7	0.008
Mobile - Commercial Marine Vessels	261.42	7	0.718
Mobile - Locomotives	791.46	7	2.174
Mobile - Locomotives	1327.79	7	3.648
Waste Disposal	5.40	6	0.017
Total	<u>3165.17</u>		<u>8.70</u>

Table 3: Area VOCs by Sector

Area VOCs by Sector	Tons/year	Seasonal Factor	Days/Week	Ozone Season Daily tons/day
Biogenics - Vegetation and Soil	6193.09	1	7	17.014
Bulk Gasoline Terminals	45.11	1	6	0.145
Bulk Gasoline Terminals	102.99	1	6	0.330
Commercial Cooking	0.33	1	7	0.0009
Fires - Agricultural Field Burning	240.50	1	7	0.661
Fires - Prescribed Fires	569.34	1	7	1.564
Fuel Comb - Comm/Institutional - Other	0.0005	0.6	6	0.000001
Fuel Comb - Residential - Natural Gas	1.80	0.3	7	0.001
Fuel Comb - Residential - Oil	0.0015	0.3	7	0.000001
Fuel Comb - Residential - Other	0.24	0.3	7	0.0002
Fuel Comb - Residential - Wood	16.76	0.3	7	0.014
Gas Stations	455.64	1	7	1.252
Industrial Processes - Storage and Transfer	110.24	1	6	0.353
Industrial Processes - Storage and Transfer	141.73	1	6	0.454
Miscellaneous Non-Industrial NEC	68.29	1	6	0.219
Mobile - Aircraft	6.16	1	7	0.017
Mobile - Commercial Marine Vessels	5.98	1	7	0.016
Mobile - Locomotives	39.09	1	7	0.107
Mobile - Locomotives	92.02	1	7	0.253
Solvent - Consumer & Commercial Solvent Use	650.71	1	6	2.086
Solvent - Dry Cleaning	1.93	1	6	0.006
Solvent - Industrial Surface Coating & Solvent Use	56.50	1	6	0.181
Solvent - Non-Industrial Surface Coating	59.56	1	6	0.191
Waste Disposal	<u>10.95</u>	1	6	<u>0.035</u>
Total	<u>8,868.94</u>			<u>24.90</u>

Table 4: Area CO by Sector

Area CO by Sector	Tons/year	Days/Week	Ozone Season Daily tons/day
Biogenics - Vegetation and Soil	1425.79	7	3.92
Bulk Gasoline Terminals	1.58	6	0.01
Fires - Agricultural Field Burning	2760.70	7	7.58
Fires - Prescribed Fires	2386.49	7	6.56
Fuel Comb - Comm/Institutional - Other	0.008	6	0.00003
Fuel Comb - Residential - Natural Gas	13.11	7	0.04
Fuel Comb - Residential - Oil	0.01	7	0.00003
Fuel Comb - Residential - Other	3.67	7	0.01
Fuel Comb - Residential - Wood	97.13	7	0.27
Miscellaneous Non-Industrial NEC	0.001	6	0.000003
Mobile - Aircraft	227.07	7	0.62
Mobile - Commercial Marine Vessels	53.14	7	0.15
Mobile - Locomotives	171.40	7	0.47
Mobile - Locomotives	116.71	7	0.32
Waste Disposal	118.76	6	0.38
Total	<u>7375.56</u>		<u>20.32</u>

SECTION II

A. ON-ROAD SOURCE INVENTORY

On-road mobile sources consist of passenger cars, passenger trucks, motorcycles, buses, heavy-duty trucks, and other motor vehicles traveling on public roadways. Combustion-related emissions are estimated for vehicle engine exhaust, and evaporative hydrocarbon emissions are estimated for the fuel tank and other non-tailpipe sources from the vehicle. To calculate pollution from on-road mobile sources, emission rates are estimated as a function of county, vehicle type, roadway type, hour, and operating speed. These rates are then matched with appropriate activity from transportation data parameters such as vehicle miles traveled (VMT), number of vehicles parked, hours spent in extended idle mode, etc.

Arkansas utilized a county scale run of the MOVES 2010b model for this data.

Table 5: On-Road Mobile

Category	Ozone Season Daily NOx	Annual NOx	Ozone Season Daily VOC	Annual VOC	Ozone Season Daily CO	Annual CO
Units	tons/day	tons/year	tons/day	tons/year	tons/day	tons/year
On-road Mobile	6.80	2,542	2.42	845	23.13	9,051

SECTION III

A. NON-ROAD EMISSION INVENTORY

Non-road mobile sources encompass a wide variety of equipment types that either move under their own power or are capable of being moved from site-to-site. More specifically, these sources, which are not licensed or certified as highway vehicles, are defined as those that move or are moved within a 12-month period and are covered under the EPA's emissions regulations as non-road mobile sources. The non-road EI includes emissions from non-road equipment such as:

- Agricultural equipment (i.e. tractors, combines and balers)
- Construction equipment (i.e. graders and back hoes)
- Industrial and commercial equipment (i.e. fork lifts and sweepers)
- Residential and commercial lawn and garden equipment (i.e. lawn mowers and weed trimmers)
- Recreational equipment, (i.e. four wheelers and off-road motorbikes)

This category does not include commercial marine, locomotives, and aircraft.

Arkansas utilized the National Mobile Inventory Model for this data.

Table 6: Non-Road Mobile

Category	Ozone Season Daily NOx	Annual NOx	Ozone Season Daily VOC	Annual VOC	Ozone Season Daily CO	Annual CO
Units	tons/day	tons/year	tons/day	tons/year	tons/day	tons/year
Non-road Mobile	2.11	582.63	3.66	881.35	13.78	3,476.63

SECTION IV

A. POINT SOURCE INVENTORY

Point Sources are large, stationary, emissions sources that release pollutants into the atmosphere. Stationary point source emissions data is collected annually from those sources that meet reporting requirements outlined in the Air Emissions Reporting Requirements (40 C.F.R. Part 51). These sources include, but are not limited to, refineries, chemical plants, bulk terminals, and utilities. Facilities are required to report emissions data via a web-based database system. Reporting of information characterizing the process equipment, the abatement units, and the emission points is also required.

The Arkansas Department of Environmental Quality is responsible for compiling the point source inventory. The Air Division Emission Inventories and Data Management Section is accountable for identifying point sources that meet the reporting threshold criteria as outlined in the AERR and the collection of facility emissions data from designated reporting facilities. ADEQ also processes, compiles, and manages the collected emissions data. Emissions data provided by reporting facilities includes estimates of actual emissions generated by the facility during the previous year. Estimation methodologies are required to follow state and federal guidelines.

ADEQ uses a web-based emissions inventory reporting and database management system to gather point source data from the regulated community. The system is named SLEIS (State & Local Emissions Inventory System). For the 2011 EI, facilities could use SLEIS to electronically submit their EI reports to ADEQ for review; however, they also were required to submit a paper copy of the certifying statement, signed by the responsible official. All submitted data is reviewed for quality assurance purposes and then stored in the SLEIS database. At the end of the annual reporting cycle, point source emission data is reported each year to the EPA for inclusion in the National Emissions Inventory (NEI).

Table 7: Point Source

Ozone Season Daily NOx	Annual NOx	Ozone Season Daily VOC	Annual VOC	Ozone Season Daily CO	Annual CO
tons/day	tons/year	tons/day	tons/year	tons/day	tons/year
0.0017	0.63	0.51	186.84	0.004	1.58

Appendix B

Emissions Projection Methodology

APPENDIX B

The following is the methodology used to develop the projected future year emissions for Crittenden County.

- 1) Downloaded the EPA's monthly summary spreadsheet for 2017 from the following FTP site:
<ftp://ftp.epa.gov/EmisInventory/2011v6/v2platform/reports/>
- 2) The links for the 2025 county-level files for VOC and NOx are the following:
 - a. <ftp://ftp.epa.gov/EmisInventory/2011v6/v2platform/reports/2011eh%202025eh%20county%20sector%20comparison%20NOX.xlsx>
 - b. <ftp://ftp.epa.gov/EmisInventory/2011v6/v2platform/reports/2011eh%202025eh%20county%20sector%20comparison%20VOC.xlsx>
- 3) Extracted records for Crittenden County, AR from EPA spreadsheets.
- 4) Calculated summer season NOx and VOC emissions:
 - a. Kept the NOx and VOC emissions for the county for May through September, and removed the records for other pollutants
 - b. Removed the records for wild fires (sector "ptwildfire3D")
 - c. Calculated the annual total emissions with and without biogenic by sector
 - d. Calculated the sector totals for the summer season and average daily emissions with and without biogenics
- 5) Linearly interpolated the 2017 and 2025 emission totals to obtain estimates for 2020.
- 6) 2027 emission projections were linearly extrapolated from 2017-2025 emissions.

Appendix C

On-Road Mobile Input and Output Files

MOVES2014 RunSpec and County Data Manager parameters.

MOVES2014 RunSpec Parameters	Settings
Scale	County, Inventory Mode
Time Span	Time Aggregation Level = Hour Month = July (representing Summer conditions) Days = Weekdays only Hours = All hours of the day
Geographic Bounds	Crittenden County, Arkansas
Vehicles/Equipment	All valid source types/CNG, Diesel, Electricity, Ethanol, & Gasoline
Road Type	All road types including 'Off-network'
Pollutants and Processes	Oxides of Nitrogen (NO _x) & Volatile Organic Compounds (VOC)
General Output	Units = Grams, Joules, & Miles Activity = Distance Traveled, Population
Output Emissions Detail	Time = Hour, Location = County All Vehicle/Equipment Categories = Fuel Type, Emission Process On Road/Off Road = Road Type & Source Use Type
Advanced Performance Features	None
MOVES2014 County Data Manager Parameters	Data Source
Meteorological Data	Local data from NOAA data collected at the West Memphis, Arkansas Municipal Airport
Source Type Population	Local data from Arkansas Department of Finance & Administration vehicle registration database
Age Distribution	For sources 11,21,31,32,41,42,43,51,52,53,54 local data from AR Dept. of Finance & Administration vehicle registration database; for sources 61,62 MOVES National default data to better document heavy through traffic of sources 61 and 62
Vehicle Type – HPMS Vehicle Type VMT	Local data obtained from 2012 AHTD traffic classification counts conducted in Crittenden County
Vehicle Type – Monthly VMT Fractions	Local data unavailable; therefore, Monthly Fractions obtained from inputting Annual Average Weekday Vehicles Travelled (AADVMT) into the MOVES2014 AADVMT Converter
Vehicle Type – Daily VMT Fractions	Local data is unavailable; therefore, Daily Fractions obtained from inputting Annual Average Weekday Vehicles Travelled (AADVMT) into the MOVES2014 AADVMT Converter
Vehicle Type – Hourly VMT Fractions	Local data is unavailable; therefore, Hourly Fractions obtained from inputting Annual Average Weekday Vehicles Travelled (AADVMT) into the MOVES2014 AADVMT Converter
Average Speed Distribution	Local data obtained from 2012 AHTD traffic classification counts conducted in Crittenden County
Ramp Fraction	Default Ramp Fraction 0.08 used for both Road Type 2 (Rural restricted Access) and Road Type 4 (Urban restricted Access)
Fuel Supply/Fuel Formulation	MOVES2014 default data used with Gasoline Reid Vapor Pressure changed to 9.0psi
Alternative Fuel Vehicle types	Memphis Area Transit Authority provides fixed-route transit buses operating in Crittenden County and some buses have alternate fuel capability, which is reflected in the Default Fuels data
I/M Program	There is not a I/M program in Crittenden County; therefore, no data was entered

MOVES2014 Outputs of weekday Distance traveled by Source Type.

Source Type Description	Source Type ID	Analysis Year						
		2012	2017	2020	2027	2037	2040	
Motorcycle	11	16,660	18,959	19,638	21,387	24,062	24,931	
Passenger Car	21	1,394,109	2,092,454	1,671,358	1,890,948	2,608,748	2,254,334	
Passenger Truck	31	447,722	1,955	482,350	449,571	2,004	434,821	
Light Commercial Truck	32	9,146	2,016	9,848	9,183	2,068	8,883	
Intercity Bus	41	0	0	0	0	0	0	
Transit Bus	42	0	0	0	0	0	0	
School Bus	43	21,656	24,856	25,773	28,124	31,754	32,936	
Refuse Truck	51	14,106	16,175	16,771	18,337	20,497	21,217	
Single Unit Short-haul Truck	52	28,888	32,940	34,073	37,035	41,631	43,120	
Single Unit Long-haul Truck	53	27,087	30,836	31,896	34,624	38,956	40,345	
Motor Home	54	704	839	888	986	1,072	1,104	
Combination Short-haul Truck	61	229,705	235,261	269,157	325,183	353,233	367,261	
Combination Long-haul Truck	62	521,723	638,239	639,074	670,041	780,358	811,518	
Total Distance Traveled (Weekday Miles)		2,711,506	3,094,530	3,200,826	3,485,419	3,904,383	4,040,470	

MOVES2014 Outputs of weekday NO_x emissions (grams) by source Type.

Source Type Description	Source Type ID	Analysis Year					
		2012	2017	2020	2027	2037	2040
Motorcycle	11	12,355	13,416	13,758	14,796	16,596	17,320
Passenger Car	21	855,211	554,930	302,407	157,124	111,411	95,551
Passenger Truck	31	691,662	1,250	201,720	76,184	137	27,781
Light Commercial Truck	32	14,842	1,372	4,411	1,700	159	642
Intercity Bus	41	0	0	0	0	0	0
Transit Bus	42	0	0	0	0	0	0
School Bus	43	180,594	150,592	111,133	54,488	24,856	23,947
Refuse Truck	51	87,614	56,720	40,934	24,439	21,602	22,116
Single Unit Short-haul Truck	52	74,033	45,617	34,115	21,381	18,214	18,457
Single Unit Long-haul Truck	53	68,091	46,442	34,800	22,867	19,362	19,355
Motor Home	54	2,481	1,926	1,543	1,069	601	536
Combination Short-haul Truck	61	2,249,811	1,174,529	841,875	459,397	370,282	382,376
Combination Long-haul Truck	62	8,838,483	6,557,733	5,389,914	3,869,843	3,663,973	3,798,291
Total NO_x Emissions (grams)		13,075,177	8,604,527	6,976,610	4,703,288	4,247,193	4,406,372

MOVES2014 Outputs of weekday VOC emissions (grams) by source Type.

Source Type Description	Source Type ID	Analysis Year					
		2012	2017	2020	2027	2037	2040
Motorcycle	11	28,148	29,498	30,471	33,155	36,433	38,036
Passenger Car	21	562,610	473,334	318,474	210,571	155,573	145,366
Passenger Truck	31	412,914	839	147,027	62,132	140	32,431
Light Commercial Truck	32	8,557	882	3,059	1,292	149	683
Intercity Bus	41	0	0	0	0	0	0
Transit Bus	42	0	0	0	0	0	0
School Bus	43	21,451	16,123	11,915	5,789	2,262	2,315
Refuse Truck	51	5,206	3,481	2,679	1,815	1,740	1,800
Single Unit Short-haul Truck	52	13,496	9,725	7,963	6,419	6,239	6,489
Single Unit Long-haul Truck	53	10,177	5,928	4,369	2,710	2,045	2,108
Motor Home	54	836	798	710	594	495	501
Combination Short-haul Truck	61	116,139	58,566	45,651	31,510	27,823	28,897
Combination Long-haul Truck	62	1,024,918	810,183	686,763	537,268	533,005	553,845
Total VOC Emissions (grams)		2,204,452	1,409,357	1,259,081	893,255	765,904	812,471

Appendix D

Memorandum of Agreement for Memphis, TN-MS-AR MSA

JUN 27 2000

MEMORANDUM OF AGREEMENT
ON AIR QUALITY MONITORING FOR CRITERIA POLLUTANTS FOR
THE MEMPHIS, TN-MS-AR
METROPOLITAN STATISTICAL AREA (MSA)

Participating Agencies:

Memphis and Shelby County Health Dept. (MSCHD)
Air Pollution Control Program

Mississippi Department of Environmental Quality (MDEQ)
Office of Pollution Control, Air Division

Arkansas Department of Environmental Quality (ADEQ)

PURPOSE/OBJECTIVES/GOALS

The purpose of this Memorandum of Agreement (MOA) is to establish the Memphis, Tennessee-Mississippi-Arkansas Metropolitan Statistical Area (MSA) Criteria Pollutant Air Quality Monitoring Agreement among MSCHD, MDEQ AND ADEQ to collectively meet United States Environmental Protection Agency (EPA) minimum monitoring requirements for particles of an aerodynamic diameter of 10 micrometers and less (PM 10), particles of an of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), and ozone; as well as other criteria pollutant air quality monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all parties. This MOA will formalize and reaffirm the collective agreement in order to provide adequate criteria pollutant monitoring for the Memphis, TN-MS-AR MSA as required by 40 CFR 58 Appendix D, Section 2, (e).

PM 2.5 MSA monitoring network include:

County	Federal Reference Method PM2.5	Continuous PM2.5	Speciation PM2.5	Colocated PM2.5
Shelby County, TN MSCHD	2	1	1	1
Crittenden County, AR ADEQ	1	1		
DeSoto County, MS MDEQ	1	1		1

Criteria Air Pollutant MSA monitoring network include:

County	PM 10	O₃	NO_x/NO/NO₂	CO	SO₂
Shelby County, TN MSCHD	2	2	1	1	1
Crittenden County, AR ADEQ		1	1		
DeSoto County, MS MDEQ		1			

RESPONSIBILITIES/ACTIONS

Each of the parties to this Agreement is responsible for ensuring that its obligations under MOA are met. As conditions warrant, the affected agencies may conduct telephone conference calls, meetings, or other communications to discuss monitoring activities for the MSA. Each affected agency shall inform the other affected agencies via telephone or email of any monitoring changes occurring within its jurisdiction of the MSA at its earliest convenience, after learning of the need for the change or making the changes. Such unforeseen changes may include evictions from monitoring sites, destruction of monitoring sites due to natural disasters, or any occurrences that result in an extended (greater than one quarter) or permanent change in the monitoring network.

LIMITATIONS

- All commitments made in this MOA are subject to the availability of appropriated funds and each agency's budget priorities. Nothing in this MOA obligates MSCHD, MDEQ or ADEQ to expend appropriations or to enter into any contract, assistance agreement, interagency agreement or other financial obligation.
- This MOA is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between parties to this agreement will be handled in accordance with applicable laws, regulations, and procedures, and will be subject to separate agreements that will be affected in writing by representatives of the parties.
- This MOA does not create any right or benefit enforceable by law or equity against MSCHD, MDEQ or ADEQ, their officers or employees, or any other person. This MOA does not apply to any entity outside MSCHD, MDEQ or ADEQ.
- No proprietary information or intellectual property is anticipated to arise out of this MOA.

TERMINATION

This Memorandum of Agreement may be revised upon the mutual consent of MSCHD, MDEQ and ADEQ. Each party reserves the right to terminate this MOA. A thirty (30) day written notice must be given prior to the date of termination.

APPROVALS

We agree with the provisions outlined in this Memorandum of Agreement and commit our agencies to implement them in a spirit of cooperation and mutual support.


Shelby County Government
Memphis and Shelby County Health Dept. (MSCHD)
Air Pollution Control Program

BY:  5/18/05

TITLE: Mayor, Shelby County Government

DATE: _____

Mississippi Department of Environmental Quality (MDEQ)
Office of Pollution Control, Air Division

APPROVED AS TO FORM AND LEGALITY:

Assistant Contract Administrator
Assistant County Attorney

BY: Maya Rao

TITLE: Chief, Air Division

DATE: 05/28/08

Arkansas Department of Environmental Quality (ADEQ)

BY: Terina Mark

TITLE: Director

DATE: 6/20/08

Appendix E

Complete Record of the Public Hearing and Comment Period



News Release

Contact Information: Katherine Benenati / 501.682.0821 / benenati@adeq.state.ar.us

FOR RELEASE: Oct. 16, 2015

HEARING SET ON CRITTENDEN COUNTY OZONE DESIGNATION

The Arkansas Department of Environmental Quality (ADEQ) will hold a public hearing at West Memphis Nov. 5, 2015, on the proposed removal of the “nonattainment” designation for ozone compliance under federal air quality standards which has applied to Crittenden County since 2012. The hearing will begin at 10:30 a.m. in the West Room of the West Memphis Civic Center, 228 Polk Street.

Air quality monitoring during the past three years has shown the county to be in compliance with the 2008 federal eight-hour standard for ozone, so the ADEQ proposes to amend the current State Implementation Plan (SIP) for Air Pollution Control to list Crittenden County as an “attainment” area for ozone.

Ozone is a highly reactive, odorless, colorless gas that is produced when oxides of nitrogen (NO_x) and volatile organic compounds (VOC’s) react, in the presence of sunlight. Sources of NO_x and VOC’s include automobile exhaust, emissions from industrial processes, vapors from solvents and fuels, among others. Ozone is desirable in the upper atmosphere, because it helps shield the Earth from cosmic radiation. However, at ground level, ozone exposure can cause or aggravate respiratory conditions or other problems for humans and animals, as well as damage crops and other vegetation.

On May 21, 2012, Crittenden County, Arkansas, Shelby County, Tennessee, and a portion of DeSoto County, Mississippi, were classified as a marginal nonattainment area under the 2008 federal eight-hour ozone standard.

Ozone monitoring in the area between 2012 and 2014 shows ozone levels below the eight-hour 2008 federal ozone standard of 0.075 parts per million. Therefore, ADEQ will request that the U.S. Environmental Protection Agency (EPA) redesignate Crittenden County as an ozone “attainment” area, and will submit to EPA a Maintenance Plan to keep the area in compliance with the standard for a minimum of 10 years.

Written and oral comments on the proposed change will be accepted at the hearing, but written comments are preferred in the interest of accuracy. In addition, written or electronic mail comments will be considered if received by the ADEQ no later than 4:30 p.m. (Central Time) Nov. 16, 2015. Written comments should be sent to Kelly Jobe, Air Division, Arkansas Department of Environmental Quality, 5301 Northshore Drive, North Little Rock, AR 72118. E-mail comments should be sent to jobe@adeq.state.ar.us.

Copies of the proposed amendment to the SIP are available for public inspection during normal business hours at the ADEQ Headquarters Building at the address above, or at the West Memphis Public Library, 213 North Avalon Street. In addition, the document may be viewed or downloaded from the ADEQ website at the following address:

http://www.adeq.state.ar.us/air/planning/crittenden_county_redesignation_request_external_review_draft_w-emissions_10-8-15.pdf.

Arkansas Democrat Gazette

STATEMENT OF LEGAL ADVERTISING

ADSO
 5991 NORTHEAST DR
 NORTH LITTLE ROCK AR 72118

REMIT TO:
 ARKANSAS DEMOCRAT-GAZETTE, INC.
 P.O. BOX 2221
 LITTLE ROCK, AR 72203

ATTN: Fiscal Office
 DATE : 10/16/15 INVOICE #: 3056090
 ACCT #: 1844316 P.O. #:

BILLING QUESTIONS CALL 378-3812

AD COPY

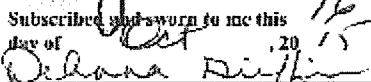
STATE OF ARKANSAS,)
 COUNTY OF PULASKI,) ss.

I, Yvette Hines, do solemnly swear that I am the legal Billing Clerk of the Arkansas Democrat Gazette, a daily newspaper printed and published in said County, State of Arkansas; that I was not related to this publication at and during the publication of the annexed legal advertisement in the manner of:

PERMIT
 pending in the Court, in said County, and on the dates of the several publications of said advertisements stated below, and that during said periods and at said dates, said newspaper was printed and had a bona fide circulation in said County; that said newspaper had been regularly printed and published in said County, and had a bona fide circulation therein for the period of one month before the date of the first publication of said advertisements; and that said advertisement was published in the regular daily issues of said newspaper as stated below.

DATE	DAY	LINEAGE	RATE	DATE	DAY	LINEAGE	RATE
10/16	Fri	108	1.25				

TOTAL COST ----- 145.80
 Billing Ad #: 75410964

Subscribed and sworn to me this 16
 day of Oct, 2015

 Deanna Griffin
 Notary Public

OFFICIAL SEAL - No. 12347408
 DEANNA GRIFFIN
 NOTARY PUBLIC - ARKANSAS
 PULASKI COUNTY
 MY COMMISSION EXPIRES 3-30-2019

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

HEARING/MEETING REGISTRATION

Name <i>Please Print Legibly</i>	Address			Organization Represented
	<i>Street</i>	<i>City</i>	<i>State</i>	<i>Zip</i>
Stuart Spencer	A/E R			
Kelly Jobe	"			
Mark McGonkle	"			
James Starling	"			
Dong Szenher	"			

Public hearing/meeting on: Crittenden Co. Ozone Redesignation Date: 11/5/15
 Location: West Memphis Page 1 of 1

Appendix F

Responsiveness Summary

Responsiveness Summary

The public comment period for the 2008 Eight-Hour Ozone Redesignation Request (Request) and Maintenance Plan (Plan) for Crittenden County, Arkansas closed on November 16, 2015, the first business day occurring at least 30 days after publication of the Public Notice. Two comment documents were received. Copies of the comments received from the Region 6 office of the United States Environmental Protection Agency (EPA-R6) and Eddie Brawley (on behalf of the West Memphis Area Transportation Study group) are included herein. Comments and ADEQ responses are separated by topic in the following text.

The “Calcagni Memo”

EPA-R6 commented that the Request and Plan needed to be consistent with the EPA guidance found in the September 4, 1992 EPA memo “Procedures for Processing Request to Redesignate Areas to Attainment.” ADEQ has reviewed this guidance document, also called the “Calcagni Memo” and incorporated a reference to it in the Plan (see Section 1. – Introduction). The Plan is consistent with the EPA guidance described in the Calcagni Memo.

Emissions Statements

Clean Air Act (CAA) section 182(a)(3)(B) calls for the SIP to require that owners or operators of each stationary source of NOX and VOC in an ozone non-attainment area submit an annual emissions statement. The emissions statement must show the actual emissions of NOX or VOC and contain a certification that the information contained in the statement is accurate to the best knowledge of the individual certifying the statement.

Arkansas Pollution Control and Ecology Commission (APC&EC) Regulation 19, Chapter 7 (Sampling, Monitoring, and Reporting Requirements) requires emissions statements. Specifically, APC&EC Regulation 19.705(D) states, “Each emission inventory is to be accompanied by a certifying statement, signed by the owner(s) or operator(s) and attesting that the information contained in the inventory is true and accurate to the best knowledge of the certifying official. The certification shall include the full name, title, signature, date of signature, and telephone number of the certifying official.” This provision is a statewide rule, applying to all counties in Arkansas. By requiring the owner or operator of each stationary source to submit annual statements of emissions of NOX and VOCs, APC&EC Regulation 19.705 meets the requirements of CAA section 182(a)(3)(B).

The emissions statements requirements in APC&EC Regulation 19.705 were approved by the EPA-R6 on January 15, 2009 (**Federal Register** /Vol. 74, No. 10 /Thursday, January 15, 2009). Section 4.3 of the Plan addresses Emissions Statements.

Nonattainment New Source Review

All major sources in Arkansas are subject to the permitting requirements of APC&EC Regulation No. 19 – Regulations of the Arkansas Plan of Implementation for Air Pollution Control. APC&EC Regulation No. 31 - Nonattainment New Source Review Requirements, Effective Date: May 28, 2006 was approved by EPA-R6 on April 12, 2007 (72 FR 18394) effective May 14, 2007. New major sources in Crittenden County, Arkansas are subject to APC&EC Regulation Nos. 19 and 31 until such time as the area is redesignated. At such time as the area is redesignated, facilities in Crittenden County, Arkansas will continue to be subject to the requirements of APC&EC Regulation No. 19 (see Section 4.2).

Emission Inventory Requirement

The Emission Inventory Requirement is described in Section 4.1 of the Plan. EPA-R6 recommended that the Plan include information on inventories for the Tennessee and Mississippi portions of the nonattainment area. It has been determined that, since these inventories were developed in different formats and for different future years, consolidation of these inventories would not be appropriate or useful. Information on the emissions inventory is contained in Section 5.1 – Emissions Inventory

Motor Vehicle Emissions Budget

Both EPA-R6 and Mr. Brawley commented on elements of Table 6 and the “safety margin” described therein. Table 5 was also mislabeled. These comments have been addressed by a revision to Section 5.2 - Motor Vehicle Emissions Budget. This revision is a clarification only and does not modify the Motor Vehicle Emissions Budget or other elements of the Plan.

From: Eddie Brawley [<mailto:ebrawley@sbcglobal.net>]
Sent: Thursday, October 22, 2015 4:54 PM
To: Jobe, Kelly
Subject: Re: [WMATS] Mobile Source Category 'Safety Margin' Calculations

No, thank you all for the hard work you are doing!

From: "Jobe, Kelly" <JOBE@adeq.state.ar.us>
To: Eddie Brawley <ebrawley@sbcglobal.net>
Sent: Thursday, October 22, 2015 11:02 AM
Subject: RE: [WMATS] Mobile Source Category 'Safety Margin' Calculations

Hi Eddie,

Yes, what you're saying does make sense. We will make the corrections before the document goes final. Thanks for pointing that out.

Kelly

From: Eddie Brawley [<mailto:ebrawley@sbcglobal.net>]
Sent: Monday, October 19, 2015 4:50 PM
To: WMATS@yahogroups.com; McCorkle, Mark; Jobe, Kelly; Virginia Porta; Jeffrey Riley; Clark, David; Amy Heflin; Bobby Williams
Subject: Re: [WMATS] Mobile Source Category 'Safety Margin' Calculations

David, Kelly, I saw in local paper the advertisement for the public hearing on Crittenden County Ozone Redesignation and noticed on page 11 of the report, paragraph 4.2, that Table 5 is referred to as MVEB but in actuality that was not the MVEB but it was the projected on-road emissions using MOVES2014 for the 2012 attainment year and the out years. The 2012 numbers are the base year budget numbers but the 2027 numbers are not unless approved as such by the Interagency Committee. Although the paragraph relating to Table 6 explains the Safety Margin, the two tables claiming to be the Motor Vehicle

Emissions Budget could be confusing for some who have not been involved in the process. After Table 6, I think it would help to have a specific table that points out the final, approved MVEB for both 2012 and 2027 for VOC and NOx similar to Table 5 except with red bold letters (just kidding that could be an overkill). Call me if this does not make sense.

Thanks,

Eddie

From: "David Clark clarkd_adeq@yahoo.com [WMATS]" <WMATS@yahoogroups.com>
To: WMATS <wmats@yahoogroups.com>; Mark McCorkle <mac@adeq.state.ar.us>; Kelly Jobe <jobe@adeq.state.ar.us>; Virginia Porta <virginia.porta@ahtd.ar.gov>; Jeffrey Riley <riley.jeffrey@epa.gov>; Eddie Brawley <ebrawley@sbcglobal.net>; David Clark <clarkd@adeq.state.ar.us>; Amy Heflin <amy.heflin@dot.gov>; Bobby Williams <bobbywilliams@sbcglobal.net>
Sent: Wednesday, October 14, 2015 9:16 AM
Subject: [WMATS] Mobile Source Category 'Safety Margin' Calculations

Hello All,

As a follow-up to the yesterday afternoon WMATS conference call, below is the math that will be used to calculate the 'Safety Margin' to be applied to the 2027 Mobile Source MVEB. We agreed to a 'Safety Margin' of 80% of the 2012/2027 difference of the Mobile Source MVEBs that will get added to the MOVES-determined 2027 MVEB of 5.18 tpd. So for NOx: $13.04 - 5.18 = 7.86$ x 0.8 = 6.29 + 5.18 = 11.47 tpd for the 2027 NOx MVEB when you include the 'Safety Margin'; likewise calculation for VOC equaling 2.08 tpd for the 2027 VOC MVEB when you include the 'Safety Margin'. Please verify my math.

David

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Posted by: David Clark <clarkd_adeq@yahoo.com>



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS TX 75202-2733

NOV - 5 2015

Kelly Jobe
Arkansas Department of Environmental Quality
Air Division
5301 Northshore Drive
North Little Rock, Arkansas 72118

Dear Ms. Jobe:

Thank you for the opportunity to submit comments on the October 15, 2015, draft version of the Arkansas Department of Environmental Quality State Implementation Plan revision titled, "2008 Eight-Hour Ozone Redesignation Request and Maintenance Plan for Crittenden County, Arkansas." We appreciate the improvements in air quality that make this request possible.

As you know, the requirements for redesignating Crittenden County and the larger Memphis, Tennessee ozone nonattainment area to attainment are found in Clean Air Act section 107(d)(3)(E). These are:

1. The area has attained the 2008 ozone air quality standard;
2. The EPA has fully approved the applicable implementation plan(s) for the area;
3. The air quality improvement is due to permanent and enforceable emissions reductions;
4. The EPA has fully approved a maintenance plan, including a contingency plan, for the area; which provides for maintenance of the standard for at least 10 years after redesignation; and
5. The State has met all requirements applicable to the area under section 110 and part D of the Clean Air Act.

The enclosed comments are offered to identify elements that would benefit from clarification and further evidence that the redesignation request and maintenance plan for Crittenden County meets all of these requirements. We would prefer these elements be addressed before the final redesignation request is submitted to the EPA for approval.

Please contact me or Jeff Riley of my staff at (214) 665-8542 if you have any questions.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Guy Donaldson".

Guy Donaldson, Chief
State Implementation Section

Enclosure

cc: Stuart Spencer, Arkansas Department of Environmental Quality
Tony Davis, Arkansas Department of Environmental Quality

Comments on the Draft Crittenden County 2008 Eight-Hour Ozone Redesignation Request and Maintenance Plan

General comments

Please ensure that the Crittenden County ozone redesignation request and maintenance plan is consistent with the EPA guidance found in the September 4, 1992, EPA memo "Procedures for Processing Requests to Redesignate Areas to Attainment." The guidance memo can be found at www.epa.gov/ttn/oarpg/t5/memoranda/redesignmem090492.pdf.

One condition for redesignation is that the State has met all applicable requirements for the area under section 110 and Part D (Clean Air Act section 107(d)(3)(E)). Please confirm how the area has met the Clean Air Act section 182 marginal ozone nonattainment requirements, such as the emission statement requirement, the nonattainment new source review requirement and the emissions inventory requirement. A short table listing the relevant marginal ozone nonattainment area requirements and where they were addressed in the Arkansas SIP would be useful to address this requirement.

4.1 Emissions Inventory

It is our understanding that the redesignation requests/maintenance plans being developed for Shelby County, Tennessee and DeSoto County, Mississippi will include the same base year (2012) and projection years (2017, 2020, 2027) as have been included in the Crittenden County plan. We recommend ADEQ coordinate with the Shelby County Health Department and the Mississippi Department of Environmental Quality to include maintenance period emissions projections for Shelby County and DeSoto County to demonstrate maintenance of the 2008 ozone NAAQS for the entire Memphis area.

4.2 Motor Vehicle Emissions Budget

Please ensure that the 2027 Motor Vehicle Emissions Budgets which include the available safety margin (provided in Table 6) are clearly identified as the 2027 MVEBs being submitted for approval to avoid any uncertainty as to the budgets that will be used for future West Memphis/Crittenden County transportation conformity determinations.