



**PROPOSED**

**Arizona State Implementation Plan Revision**

**Exemption of Motorcycles from Vehicle  
Emissions Inspections and Maintenance  
Program Requirements in Area A**

**Air Quality Division  
September 2009**

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## 1.0 INTRODUCTION

This revision to the State Implementation Plan (SIP) incorporates recent statutory changes to exempt Phoenix area motorcycles from Arizona's vehicle emissions inspection and maintenance (I/M) program. Revisions to SIP approved control measures must not interfere with the requirements of the Clean Air Act (CAA) as described in CAA Section 110(l):

“(l) Plan Revisions—Each revision to an implementation plan submitted by a State under this Act shall be adopted by such State after reasonable notice and public hearing. The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress (as defined in section 171), or any other applicable requirement of this Act.”

As required, this document includes analyses of emissions impacts due to the change in the I/M program and a demonstration that this SIP revision will not interfere with the ability of the program area to attain/maintain the National Ambient Air Quality Standards (NAAQS) or any other requirement of the Clean Air Act.

### 1.1 Arizona Carbon Monoxide, Ozone, and I/M Regulatory Background

Inspection and maintenance programs are required in certain areas that do not meet the carbon monoxide (CO) and ozone (O<sub>3</sub>) NAAQS with the purpose of reducing emissions and improving air quality. These programs help identify vehicles with excess emissions, provide information to assist with diagnosing malfunctions that cause excess emissions, and require repair of vehicles to bring them into compliance with emissions standards. Arizona established a mandatory vehicle emissions inspection and maintenance program in Maricopa and Pima Counties in 1975. Since establishment of the mandatory program, there have been several improvements designed to further reduce carbon monoxide and the ozone precursors, volatile organic compounds (VOC) and oxides of nitrogen (NO<sub>x</sub>), from vehicle emissions. The resulting emissions reduction benefits have helped the Phoenix area meet the 1-hour ozone and 1997 8-hour ozone air quality standards, and both the Phoenix and Tucson areas meet the carbon monoxide air quality standards.<sup>1</sup>

Among program improvements was the passage of 1993 legislation that authorized the implementation of an enhanced I/M program in the Phoenix area. On November 14, 1994, the Arizona Department of Environmental Quality (ADEQ) submitted to the U.S. Environmental Protection Agency (EPA) *Final State Implementation Plan Revision – Arizona Basic and Enhanced Vehicle Inspection/Maintenance Program*. The Enhanced Program and the Basic Program, operated in the Tucson area, were approved by EPA as elements of the Arizona SIP effective July 7, 1995 (60 FR 22518; May 8, 1995). Subsequent revisions in June 2001, and February 2002, included an increase in the vehicle emissions inspection program area to incorporate high-growth areas adjacent to metropolitan Phoenix, adoption of onboard diagnostic testing to include current technology and improve customer convenience, and provisions for a one time only waiver from meeting applicable emissions standards for the life of a vehicle. These changes were approved by EPA effective February 21, 2003 (68 FR 2912; January 22, 2003).

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<sup>1</sup> On June 15, 2005, the 1-hour ozone NAAQS was revoked so that the only ozone NAAQS under the Clean Air Act is the 8-hour standard adopted in 1997 and later revised in 2008.

At the time of the 1994 submittal, the Maricopa County carbon monoxide and 1-hour ozone planning areas were both classified as “moderate” nonattainment areas. Under the 1990 CAA amendments, moderate classifications for either pollutant require a basic I/M program. Due to rapid population growth in the Phoenix metropolitan area and the difficulty of demonstrating attainment for CO and ozone, the State legislature authorized an enhanced I/M program for the Maricopa County nonattainment areas. This action implemented measures to aid the State in meeting federal requirements for demonstrating reasonable further progress to reduce emissions of volatile organic compounds by 15 percent (63 FR 28898; May 27, 1998). Because the Maricopa County carbon monoxide and 1-hour ozone nonattainment areas had not attained the air quality standards by the applicable attainment date, both areas were subsequently reclassified to “serious” on August 28, 1996 (61 FR 39343; July 29, 1996) and February 13, 1998 (62 FR 60001; November 6, 1997, and 63 FR 7290; February 13, 1998), respectively. These actions triggered a federal requirement for the already implemented enhanced I/M program.

The enhanced I/M program is currently operated in the expanded Phoenix metropolitan area, known as Area A, located in portions of Maricopa, Pinal, and Yavapai Counties, and requires periodic emissions inspection of motor vehicles registered or regularly operated within the area.<sup>2</sup> This program is among the primary control measures used to help the Phoenix area attain and maintain the ozone and carbon monoxide air quality standards. Following several years of monitored air quality data meeting the standards and submittal of maintenance plans, the Phoenix area was redesignated to attainment for carbon monoxide on April 8, 2005 (70 FR 11553; March 9, 2005, and 70 FR 52926; September 6, 2005) and redesignated to attainment for the 1-hour ozone standard on June 14, 2005 (70 FR 34362; June 14, 2005).<sup>3</sup>

In 1997, EPA completed an analysis of the 1-hour ozone standard and adopted a new 8-hour standard, which better protects the public from longer periods of exposure to ozone. Effective June 15, 2004, EPA designated the Phoenix area including much of eastern Maricopa County and Apache Junction in Pinal County nonattainment for the 8-hour standard (69 FR 23857; April 30, 2004). Although the 1-hour ozone standard no longer applies because the 1-hour ozone NAAQS was revoked on June 15, 2005, certain 1-hour nonattainment and maintenance obligations, including compliance with I/M requirements, continue under the anti-backsliding provisions of EPA’s 8-hour ozone Phase I implementation rule (69 FR 23951; April 30, 2004). An 8-hour ozone plan for the Phoenix nonattainment area was submitted to EPA on June 13, 2007. The plan demonstrated that the 1997 8-hour ozone standard would be met with measures that had been implemented before the 2008 ozone season. A maintenance plan and request to redesignate the area to attainment for the 1997 standard was submitted to EPA on March 23, 2009.<sup>4</sup> These plans are pending EPA action. Figure 1 illustrates the Phoenix CO and 8-hour ozone planning areas, and the I/M implementation area, Area A.

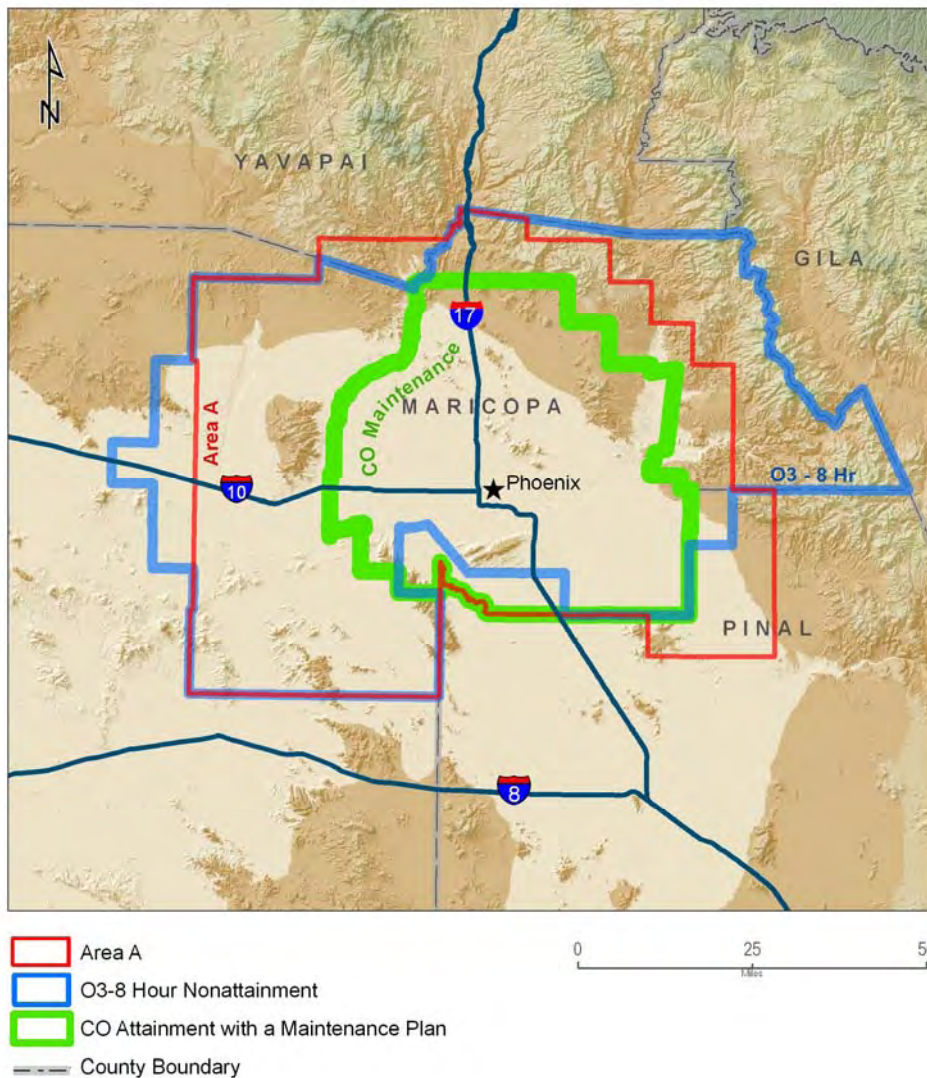
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<sup>2</sup> See ARS § 49-541(1) for a description of Area A.

<sup>3</sup> See *Final Serious Area Ozone State Implementation Plan for Maricopa County, December 2000; One-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area, March 2004; Revised MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area, March 2001; and Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area, May 2003.*

<sup>4</sup> See *Eight-Hour Ozone Plan for the Maricopa Nonattainment Area, June 2007; and MAG Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area, February 2009.*

**Figure 1: Phoenix Ozone and Carbon Monoxide Planning Areas**



Source: AAAD  
**ADEQ**  
 Arizona Department  
 of Environmental Quality  
 May 27, 2009 Author - N Caroli

In 2008 EPA revised the 8-hour ozone standard to provide more protection for children and other “at risk” populations from exposure to elevated levels of ozone pollution (73 FR 16436; March 27, 2008). Arizona submitted recommendations for areas of the State that meet or do not meet the revised standard on March 12, 2009. The only recommended nonattainment area was the greater Phoenix area including parts of Maricopa and Pinal Counties. EPA anticipates

promulgation of final area designations for the 2008 standard by March 12, 2010.<sup>5</sup> Arizona will implement the new standard as required.

In Pima County, the Tucson Air Planning Area, known as Area B, was designated as a “not classified” carbon monoxide nonattainment area at the time of the 1990 CAA amendments (56 FR 56716; November 6, 1991).<sup>6</sup> The basic I/M program is among the primary control measures used to help the Tucson area attain the carbon monoxide air quality standards. The area is currently in maintenance status following redesignation to attainment effective July 10, 2000 (65 FR 36353; June 8, 2000, and 65 FR 50651; August 21, 2000).<sup>7</sup> The Tucson area is currently meeting the 1997 and 2008 8-hour ozone NAAQS. No changes are proposed in this SIP revision for the Tucson I/M program.

## **1.2 Revisions to Arizona’s I/M Program - 2008**

In 2008 the Arizona Legislature passed House Bill (HB) 2280, which amended Arizona Revised Statutes (ARS) §49-542 to authorize the exemption of motorcycles from emissions testing requirements in Area A, the Phoenix testing area (see Appendix A for HB2280). A recent analysis performed to examine the impacts of exempting motorcycles from the Phoenix area I/M program showed that testing and repair of motorcycles in Area A does not provide a significant air quality benefit and that exemption of this vehicle category would not interfere with continued maintenance of the CO NAAQS and progress toward attainment and maintenance of the ozone NAAQS.

The changes to ARS §49-542 are self implementing and become effective if approved by EPA as a revision to the SIP on or before July 1, 2010. Conforming changes to the Arizona Administrative Code (AAC) to reflect the motorcycle exemptions will be accomplished in a future rulemaking.

A previous SIP revision to exempt collectible vehicles in the Phoenix area and collectible vehicles and motorcycles in the Tucson area was approved by EPA in 2007 (72 FR 15046; March 30, 2007).<sup>8</sup>

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<sup>5</sup> See EPA’s guidance, *Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards*, December 4, 2008.

<sup>6</sup> See ARS § 49-541(2) for a description of Area B.

<sup>7</sup> See *1987 Carbon Monoxide State Implementation Plan Revision for the Tucson Air Planning Area, 1996 Carbon Monoxide Limited Maintenance Plan for the Tucson Air Planning Area, and 2008 Revision to the Carbon Monoxide Limited Maintenance Plan for the Tucson Air Planning Area (for 2010)*.

<sup>8</sup> See *Final Arizona State Implementation Plan Revision, Basic and Enhanced Vehicle Emissions Inspection/Maintenance Programs, December 2005*; and *Supplement to Final Arizona State Implementation Plan Revision, Basic and Enhanced Vehicle Emissions Inspection/Maintenance Programs, December 2005, September 2006*.

## **2.0 DEMONSTRATING NONINTERFERENCE WITH ATTAINMENT OF THE NATIONAL AMBIENT AIR QUALITY STANDARDS OR REASONABLE FURTHER PROGRESS UNDER CLEAN AIR ACT SECTION 110(I)**

Revisions to SIP-approved control measures must not interfere with any applicable requirement concerning attainment of the air quality standards or reasonable further progress towards attaining those standards. Inspection and Maintenance or I/M is an “applicable requirement” for the Phoenix CO planning area and the ozone planning area under the anti-backsliding provisions of EPA’s 8-hour ozone Phase I implementation rule. The primary pollutants affected by I/M programs are carbon monoxide, hydrocarbons (HC) or volatile organic compounds (VOC), and to a lesser degree, oxides of nitrogen (NO<sub>x</sub>). Hydrocarbons and NO<sub>x</sub> are precursors for ground-level ozone formation. Oxides of nitrogen are also a presumptive precursor for particulate matter of size less than or equal to 2.5 microns (PM<sub>2.5</sub>).

The analyses in Sections 2.1 through 2.4 evaluate the impact of exempting Phoenix area motorcycles on air quality and demonstrate that the exemption will not interfere with attainment or maintenance of the ozone, carbon monoxide, or particulate matter NAAQS.

### **2.1 Ozone**

The vehicle emissions inspection program is a control measure for the Phoenix ozone planning area. This section presents regulatory background, emissions, and ambient monitoring information which demonstrate that the exemption of motorcycles from the I/M program will not interfere with attainment or maintenance of the ozone NAAQS.

#### **Background**

In 2004 the Phoenix area was classified as “basic” nonattainment (CAA title I, part D, subpart 1) for the 1997 8-hour ozone standard. Phase I of EPA's implementation rule was published on April 30, 2004 (69 FR 23951; April 30, 2004) and due to subsequent litigation proposed revisions were published on January 16, 2009 (74 FR 2936; January 16, 2009). The Phase I rule addresses several of the 8-hour ozone program requirements, including revocation of the 1-hour ozone standard, attainment dates, and anti-backsliding provisions to preserve air quality improvements made during implementation of the 1-hour standard. A Phase II implementation rule was proposed on November 29, 2005 (70 FR 71612; November 29, 2005) which addresses reasonable further progress, attainment demonstrations, and reasonably available control measures and technology.

A full attainment analysis for the 1997 8-hour ozone standard was submitted to EPA on June 13, 2007. This plan demonstrated that the eight-hour ozone standard would be met by June 15, 2009. A review of air quality monitoring data indicates that the area attained the 8-hour ozone standard in 2005 and has continued to meet the standard. As required, the I/M program established for attainment of the 1-hour ozone standard remains a component of the Arizona SIP to meet the anti-backsliding provisions of the Phase I rule. A maintenance plan and request to redesignate the area to attainment for the 1997 standard was submitted to EPA on March 23, 2009.<sup>9</sup> To ensure that the exemption of motorcycles will not interfere with continued attainment, modeling analyses in *MAG Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa*

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<sup>9</sup> See Footnote 4.

*Nonattainment Area, February 2009*, submitted March 23, 2009, demonstrate that the Phoenix area will maintain the 1997 8-hour ozone standard through 2025 *without* testing of Area A motorcycles.

In addition to local nonattainment area requirements, CAA Section 110(a)(2)(D) requires adequate provisions to ensure that any source or other emissions activity within the state does not contribute significantly to nonattainment, or interfere with maintenance, of the NAAQS in any other state, or interfere with any other state's required applicable implementation plan to prevent significant deterioration of air quality or to protect visibility. ADEQ submitted *Revision to the Arizona State Implementation Plan Under Clean Air Act Section 110(a)(2)(D)(i) – Regional Transport* on May 24, 2007. This revision to the Arizona SIP addressed interstate transport of air pollution under CAA Section 110(a)(2)(D)(i) and contains a demonstration showing that Arizona does not significantly contribute to interstate transport of pollutants that impact nonattainment in, or interfere with maintenance by, any other state with respect to the 1997 8-hour ozone (and PM<sub>2.5</sub>) air quality standards. The plan also demonstrates that Arizona meets the required prevention of significant deterioration of air quality and protection of visibility provisions of the law. EPA approved the plan in a Direct Final Rule on July 31, 2007 (72 FR 41629; July 31, 2007).

As noted in Section 1.1, EPA revised the 8-hour ozone standard in 2008 and Arizona submitted recommendations for areas that meet or do not meet the new standard in March 2009. Designation of area boundaries is the first step in the planning process for new or revised NAAQS. Final boundaries, however, have not yet been determined for the 2008 8-hour ozone standard.<sup>10</sup> Arizona will implement the new standard as required, including development of timely plans and adoption of any measures necessary to ensure attainment and maintenance of the new standard.

### **VOC Emissions**

Volatile organic compound emissions are one of the primary pollutants that contribute to ozone formation. According to the Maricopa County Air Quality Department's *2005 Periodic Emission Inventory for Ozone Precursors for the Maricopa County, Arizona, Nonattainment Area, September 2008*, on-road mobile sources comprise 17 percent of total VOC emissions in the Phoenix ozone planning area.

Motorcycles make up approximately 3.5 percent of tested vehicles in Area A.<sup>11</sup> Phoenix area motorcycles are currently subject to "curb idle" test procedures and maximum allowable emissions standards for carbon monoxide and hydrocarbons.<sup>12</sup> The reduction of emissions due to the repair of vehicles that exceed the prescribed emissions standards contained in AAC Title 18, Chapter 2, Article 10 is called the I/M benefit. In August 2009 the Maricopa Association of Governments completed a modeling analysis to determine the emissions reduction benefits from testing and repair of Area A motorcycles (see Appendix B). Tables 1 and 2 present the VOC emissions reduction benefits relative to both Area A and the 8-hour ozone nonattainment area.<sup>13</sup> The I/M benefit for subject vehicles is less than one tenth of a metric ton per day which equates to

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<sup>10</sup> EPA anticipates issuance of final designations by March 12, 2010. See EPA's guidance, *Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards, December 4, 2008*.

<sup>11</sup> Vehicle Emissions Inspection Program data for 2007/2008.

<sup>12</sup> See Arizona Administrative Code Title 18, Chapter 2, Article 10.

<sup>13</sup> Please note that HC is equivalent to VOC in the MOBILE6.2 model runs (see Appendix B).

less than one tenth of one percent of both on-road emissions in Area A and total emissions in the ozone planning area. The analysis demonstrates that the testing of motorcycles in Area A does not provide a significant benefit.

| <b>Table 1: Change in On-Road VOC Emissions Due to Motorcycle Exemption in Area A <sup>14</sup></b> |            |
|---|------------|
| <b>Testing Benefit/Emissions Change</b>   | <b>VOC</b> |
| I/M Benefit (metric tons per day)   | 0.0560     |
| On-Road Emissions in Area A (metric tons per day)   | 66.58      |
| Relative Emissions Increase in Area A Due to Exemption (percent of on-road emissions in Area A)     | 0.084%     |

| <b>Table 2: Change in Total VOC Emissions Due to Motorcycle Exemption Relative to the 8-Hour Ozone Nonattainment Area (1997 standard)</b> |            |
|---|------------|
| <b>Testing Benefit/Emissions Change</b>   | <b>VOC</b> |
| I/M Benefit (metric tons per day)   | 0.0560     |
| Total Emissions in the 8-Hour Ozone Nonattainment Area (metric tons per day) <sup>15</sup>  | 606.69     |
| Relative Emissions Increase Due to Exemption (percent of total emissions in the 8-hour ozone nonattainment area)                          | 0.0092%    |

For the Phoenix area, overall emissions of volatile organic compounds are estimated to rise only slightly through 2025. Committed and implemented control measures limit the projected emissions growth. Between 2005 and 2025, however, on-road mobile VOC emissions decline by more than one-third, due primarily to the replacement of older, high-polluting vehicles with new models that meet more stringent federal emission standards.<sup>16</sup>

The federal transportation conformity rule outlines criteria and procedures for ensuring that transportation projects, programs, and plans do not cause or contribute to violations of the federal air quality standards.<sup>17</sup> To evaluate the impact of these projects, a regional emissions analysis is performed on transportation improvement programs (TIP) and regional transportation plans (RTP) to determine conformance with air quality state implementation plans. The conformity rule applies to “all nonattainment and maintenance areas for transportation-related criteria pollutants for which the area is designated nonattainment or has a maintenance plan.”<sup>18</sup> Because the VOC benefit from testing motorcycles is smaller than the tenth-of-a-ton precision used in determining transportation conformity, the estimated increase in VOC would have a very small impact on conformity emissions for any analysis year.

<sup>14</sup> The year 2010 was selected to estimate emissions impacts to be consistent with the year the testing exemption for motorcycles would take effect (see Appendix B).

<sup>15</sup> Total emissions for the eight-hour ozone nonattainment area are obtained from the 2005 Periodic Emission Inventory for Ozone Precursors (MCAQD, 2008). The eight-hour ozone nonattainment area (4,880 square miles) is slightly larger than Area A (4,520 square miles).

<sup>16</sup> See Footnote 4.

<sup>17</sup> See 40 CFR Parts 51 and 93.

<sup>18</sup> See 40 CFR 93.102.

**NOx Emissions**

Oxides of Nitrogen emissions are another of the primary pollutants that contribute to ozone formation. The Area A I/M program includes NOx testing for certain automobiles, however, no emissions standards or testing are required for motorcycles. Additionally, no credit was taken for NOx reductions due to testing of motorcycles in the July 13, 2007, attainment demonstration or the March 23, 2009, maintenance plan for the Phoenix 8-hour ozone nonattainment area.

As a result of committed and implemented control measures and despite projected population growth for the Phoenix area, overall emissions of NOx are estimated to trend downward through 2025. Similar to VOC emissions trends, on-road NOx emissions are expected to be reduced nearly 30 percent between 2005 and 2025, due primarily to replacement of older, high-polluting vehicles with new models that meet more stringent federal emission standards.<sup>19</sup>

**Monitored Air Quality**

Table 3 presents the most recent quality assured ambient monitoring data and calculated compliance values for Area A for the period 2006 through 2008.<sup>20</sup> The data demonstrate that the Phoenix area continues to meet the 1997 8-hour ozone standard.

| <b>Table 3: 2006-2008 Eight-Hour Ozone Compliance (ppm) - Area A<sup>21*</sup></b>   |                      |       |       |                    |
|--|----------------------|-------|-------|--------------------|
| <i>1997 NAAQS: The three-year average of the annual fourth-highest daily maximum eight-hour average ozone concentration is less than or equal to 0.08 parts per million (ppm). Because of rounding conventions 0.085 ppm is considered an exceedance of the standard.<sup>22</sup></i> |                      |       |       |                    |
| <i>2008 NAAQS: The three-year average of the annual fourth-highest daily maximum eight-hour average ozone concentration is less than or equal to 0.075 parts per million.</i>  |                      |       |       |                    |
| City or Site   | Fourth-Highest Value |       |       | Three-Year Average |
|  | 2006                 | 2007  | 2008  |                    |
| <b>Maricopa County</b>   |                      |       |       |                    |
| Blue Point   | 0.062                | 0.058 | 0.074 | 0.064              |
| Buckeye  | 0.067                | 0.064 | 0.068 | 0.066              |
| Cave Creek   | 0.080                | 0.077 | 0.078 | <b>0.078</b>       |
| Central Phoenix  | 0.080                | 0.070 | 0.072 | 0.074              |
| Dysart   | 0.072                | 0.065 | 0.066 | 0.067              |

<sup>19</sup> See Footnote 4.

<sup>20</sup> See ADEQ Air Quality Reports and Air Monitoring Network Plans available at <http://www.azdeq.gov/function/forms/reports.html> for monitoring site locations, periods of operation, and ambient data.

<sup>21</sup> These are preliminary data as reported to EPA’s Air Quality Subsystem and have not yet been certified by the submitting agencies.

<sup>22</sup> Due to rounding conventions a “concentration of 0.085 ppm is the smallest value that is greater than 0.08 ppm” and values equal to or less than 0.084 ppm are in compliance with the standard (see 40 CFR 50, Appendix I).

**Table 3: 2006-2008 Eight-Hour Ozone Compliance (ppm) - Area A<sup>21\*</sup>**

1997 NAAQS: The three-year average of the annual fourth-highest daily maximum eight-hour average ozone concentration is less than or equal to 0.08 parts per million (ppm). Because of rounding conventions 0.085 ppm is considered an exceedance of the standard.<sup>22</sup>

2008 NAAQS: The three-year average of the annual fourth-highest daily maximum eight-hour average ozone concentration is less than or equal to 0.075 parts per million.

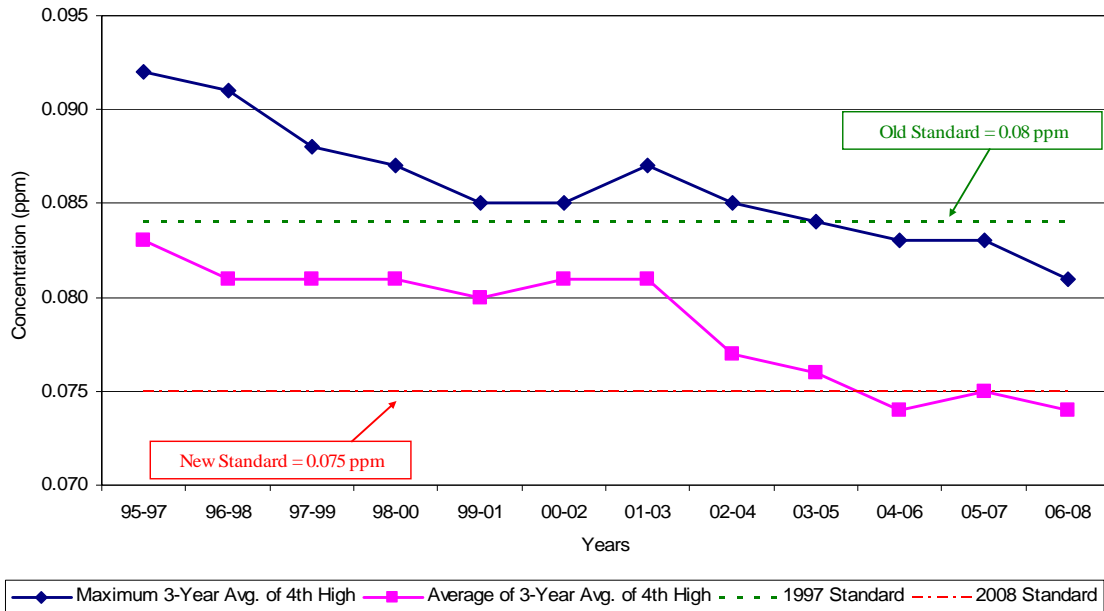
| City or Site                       | Fourth-Highest Value |       |       | Three-Year Average |
|------------------------------------|----------------------|-------|-------|--------------------|
|                                    | 2006                 | 2007  | 2008  |                    |
| <b>Maricopa County continued</b>   |                      |       |       |                    |
| Falcon Field                       | 0.079                | 0.073 | 0.075 | 0.075              |
| Fountain Hills                     | 0.084                | 0.074 | 0.079 | <b>0.079</b>       |
| Glendale                           | 0.078                | 0.071 | 0.074 | 0.074              |
| Humboldt Mt.                       | 0.079                | 0.078 | 0.077 | <b>0.078</b>       |
| JLG Supersite                      | 0.076                | 0.076 | 0.078 | <b>0.076</b>       |
| North Phoenix                      | 0.085                | 0.078 | 0.080 | <b>0.081</b>       |
| Pinnacle Peak                      | 0.076                | 0.075 | 0.073 | 0.074              |
| Rio Verde                          | 0.083                | 0.079 | 0.079 | <b>0.080</b>       |
| South Phoenix                      | 0.069                | 0.072 | 0.076 | 0.072              |
| South Scottsdale                   | 0.080                | 0.077 | 0.076 | <b>0.077</b>       |
| Tempe                              | 0.079                | 0.076 | 0.078 | <b>0.077</b>       |
| West Chandler                      | 0.081                | 0.072 | 0.077 | <b>0.076</b>       |
| West Phoenix                       | 0.082                | 0.074 | 0.078 | <b>0.078</b>       |
| <b>Pinal County</b>                |                      |       |       |                    |
| Apache Junction - Maintenance Yard | 0.084                | 0.077 | 0.079 | <b>0.080</b>       |
| Combs School                       | 0.071                | 0.057 | 0.071 | 0.066              |

\* **Bold** denotes a violation of the 2008 NAAQS. There were no violations of the 1997 NAAQS.

Although the Phoenix area is currently exceeding the 2008 8-hour standard, an examination of available data shows there has been a downward trend in monitored ambient ozone levels over the last decade due to implementation of State and federal control measures. Despite substantial increases in population and expansion of the urban area, peak ozone concentrations have decreased in the Phoenix metropolitan area as evidenced by the attainment of the 1-hour standard since 1997 and attainment of the 1997 8-hour standard beginning in 2005. Figure 2 illustrates the maximum value and average values among Area A monitoring sites. The trend line for the "maximum 3-year average of the annual fourth high" consists of the highest 3-year average selected from any of the monitors in each of the averaging periods. It clearly indicates decreasing concentrations from 0.092 ppm to 0.081 ppm, an overall drop of 0.011 ppm between 1995 and

2008. The "average of the 3-year averages of the 4th high" line represents the average of all sites with sufficient recorded data in each of the 3-year periods. The trend of this statistic also shows an overall decrease for the period, from 0.083 ppm to 0.074 ppm.

**Figure 2: 8-Hour Ozone Trends - Area A**



## **Conclusion**

Due to implemented control measures, on-road emissions are projected to continue to decrease through 2025. Ambient monitoring data reveal long term downward trends in ozone concentrations for the period 1995 through 2008. Additionally, no emissions reduction benefits from testing of motorcycles were identified or relied upon to demonstrate maintenance of the 1997 8-hour ozone NAAQS in the *MAG Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area, February 2009*. Testing of motorcycles in Area A provides little emissions reduction benefit and exemption from testing will not interfere with attainment or maintenance of the ozone air quality standards.

## **2.2 Carbon Monoxide**

The vehicle emissions inspection program is a control measure for the Phoenix carbon monoxide planning area. This section presents regulatory background, emissions and ambient monitoring information which demonstrate that the exemption of motorcycles from the I/M program will not interfere with attainment or maintenance of the carbon monoxide NAAQS.

## **Background**

The Phoenix area attained the CO standard and was redesignated to attainment in 2005 (70 FR

11553; March 9, 2005, and 70 FR 52926; September 6, 2005). Air quality modeling contained in *Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area, May 2003*, indicates that the area will maintain the CO NAAQS for at least 10 years or through 2015.

**CO Emissions**

Carbon monoxide emissions can contribute to elevated ambient concentrations. Based on the maintenance plan emissions inventory estimates for CO, on-road mobile emissions comprise 77 percent of total emissions in the modeling domain. As noted in Section 2.1, motorcycles make up approximately 3.5 percent of tested vehicles in Area A. Phoenix area motorcycles are currently subject to "curb idle" test procedures and maximum allowable emissions standards for carbon monoxide and hydrocarbons. The reduction of emissions due to the repair of vehicles that exceed the prescribed emissions standards contained in AAC Title 18, Chapter 2, Article 10 is called the I/M benefit. Tables 4 and 5 present the results of a modeling analysis to determine the CO emissions reduction benefits from testing and repair of Area A motorcycles relative to both Area A and the carbon monoxide maintenance area (see Appendix B). The I/M benefit for motorcycles is less than one third of a metric ton per day which equates to less than one tenth of one percent of both on-road emissions in Area A and total emissions in the carbon monoxide planning area. The analysis demonstrates that the testing of motorcycles in Area A does not provide a significant benefit.

A 2003 analysis demonstrated that the testing and repair of motorcycles in Area A provided a relative emissions reduction of 0.18% (a relative emissions increase in Area A of 0.18% due to exemption). As modeled by MOBILE6.2, the I/M benefits for testing vehicles (light duty vehicles as a surrogate for motorcycles) decreases for all pollutants over time. For the Phoenix area, cleaner fleets and lower emissions test failure rates have significantly reduced the I/M benefit for motorcycles in 2010, to just 0.041% of on-road emissions in Area A (see also Section 3.1.2).

| <b>Table 4: Change in On-Road CO Emissions Due to Motorcycle Exemption in Area A</b>  |           |
|---|-----------|
| <b>Testing Benefit/Emissions Change</b>   | <b>CO</b> |
| I/M Benefit (metric tons per day)   | 0.2461    |
| On-Road Emissions in Area A (metric tons per day)                                     | 593.27    |
| Relative Emissions Increase in Area A Due to Exemption (percent of on-road emissions) | 0.041%    |

| <b>Table 5: Change in Total CO Emissions Due to Motorcycle Exemption Relative to the Carbon Monoxide Maintenance Area</b> |           |
|---|-----------|
| <b>Testing Benefit/Emissions Change</b>   | <b>CO</b> |
| I/M Benefit in 2010 (metric tons per day)   | 0.2461    |
| Total Emissions in the Carbon Monoxide Maintenance Area (metric tons per day) <sup>23</sup>                               | 912.3     |
| Relative Emissions Increase Due to Exemption (percent of total emissions in the carbon monoxide maintenance area)         | 0.0269%   |

Over the long term, Phoenix area CO emissions are projected to decrease. Federal new vehicle standards and vehicle fleet turnover have helped to significantly reduce CO emissions in the region. As a result of these measures, and despite projected population growth, overall emissions of carbon monoxide are projected to trend downward through 2015. On-road CO emissions are expected to be reduced more than 24 percent between 1999 and 2015.<sup>24</sup>

The federal transportation conformity rule outlines criteria and procedures for ensuring that transportation projects, programs, and plans do not cause or contribute to violations of the federal air quality standards.<sup>25</sup> To evaluate the impact of these projects, a regional emissions analysis is performed on transportation improvement programs (TIP) and regional transportation plans (RTP) to determine conformance with air quality state implementation plans. The conformity rule applies to “all nonattainment and maintenance areas for transportation-related criteria pollutants for which the area is designated nonattainment or has a maintenance plan.”<sup>26</sup> Because the CO benefit from testing motorcycles is less than one third of a metric ton, the estimated increase in CO would have a minimal impact on conformity emissions for any analysis year.

### **Air Quality Monitoring**

Tables 6 and 7 present ambient monitoring data and calculated compliance values for the period 2006 through 2007. The Phoenix area continues to be in attainment for the health based standard for CO. The highest calculated values are equal to or less than 19 percent of the 35 parts per million (ppm) 1-hour CO standard, and 51 percent of the 9 ppm 8-hour CO standard.

| <b>Table 6: 2006-2007 One-Hour Carbon Monoxide Compliance (ppm) - Area A</b>                        |                  |                 |                  |                 |                         |
|---|------------------|-----------------|------------------|-----------------|-------------------------|
| <i>NAAQS: The highest of the second-highest values in a two-year period must not exceed 35 ppm.</i> |                  |                 |                  |                 |                         |
| <b>Site or City</b>   | <b>2006</b>      |                 | <b>2007</b>      |                 | <b>Compliance Value</b> |
|   | <b>Max Value</b> | <b>2nd High</b> | <b>Max Value</b> | <b>2nd High</b> |                         |
| <b>Maricopa County</b>  |                  |                 |                  |                 |                         |
| Buckeye   | 1.2              | 1.2             | 3.9              | 1.6             | 1.6                     |
| Central Phoenix   | 6.0              | 4.8             | 4.1              | 4.0             | 4.8                     |
| Dysart  | 1.3              | 1.3             | 1.8              | 1.7             | 1.7                     |

<sup>23</sup> Emissions estimate for 2006 contained in the *Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area, May 2003*.

<sup>24</sup> See Footnote 3.

<sup>25</sup> See Footnote 16.

<sup>26</sup> See Footnote 17.

| <b>Table 6: 2006-2007 One-Hour Carbon Monoxide Compliance (ppm) - Area A</b>                        |           |          |           |          |                  |
|---|-----------|----------|-----------|----------|------------------|
| <i>NAAQS: The highest of the second-highest values in a two-year period must not exceed 35 ppm.</i> |           |          |           |          |                  |
| Site or City  | 2006      |          | 2007      |          | Compliance Value |
|   | Max Value | 2nd High | Max Value | 2nd High |                  |
| <b>Maricopa County continued</b>  |           |          |           |          |                  |
| Glendale  | 3.8       | 2.9      | 4.3       | 3.3      | 3.3              |
| Greenwood   | 6.3       | 5.2      | 4.6       | 4.6      | 5.2              |
| JLG Supersite   | 5.3       | 4.5      | 4.6       | 4.3      | 4.5              |
| Mesa  | 4.1       | 3.5      | 3.9       | 2.5      | 3.5              |
| North Phoenix   | 3.5       | 3.3      | 3.4       | 3.0      | 3.3              |
| South Phoenix   | 5.2       | 4.7      | 4.9       | 4.3      | 4.7              |
| South Scottsdale  | 5.5       | 3.1      | 2.7       | 2.6      | 3.1              |
| Tempe   | 3.7       | 3.4      | 3.2       | 2.8      | 3.4              |
| West Chandler   | 2.7       | 2.6      | 2.7       | 2.4      | 2.6              |
| West Indian School  | 7.8       | 7.7      | 6.2       | 5.7      | 7.7              |
| West Phoenix  | 7.2       | 6.5      | 6.0       | 6.0      | 6.5              |

| <b>Table 7: 2006-2007 Eight-Hour Carbon Monoxide Compliance (ppm) - Area A</b>                     |           |          |           |          |                  |
|--|-----------|----------|-----------|----------|------------------|
| <i>NAAQS: The highest of the second-highest values in a two-year period must not exceed 9 ppm.</i> |           |          |           |          |                  |
| Site or City   | 2006      |          | 2007      |          | Compliance Value |
|  | Max Value | 2nd High | Max Value | 2nd High |                  |
| <b>Maricopa County</b>   |           |          |           |          |                  |
| Buckeye  | 0.7       | 0.6      | 1.0       | 0.8      | 0.8              |
| Central Phoenix  | 3.8       | 3.2      | 2.9       | 2.9      | 3.2              |
| Dysart   | 0.9       | 0.8      | 1.3       | 1.3      | 1.3              |
| Glendale   | 1.9       | 1.8      | 1.8       | 1.6      | 1.8              |
| Greenwood  | 3.6       | 3.5      | 4.0       | 3.0      | 3.5              |
| JLG Supersite  | 3.0       | 2.9      | 3.1       | 2.9      | 2.9              |
| Mesa   | 2.8       | 2.0      | 2.0       | 2.0      | 2.0              |
| North Phoenix  | 2.0       | 1.9      | 1.7       | 1.6      | 1.9              |
| South Phoenix  | 3.2       | 2.7      | 3.1       | 2.3      | 2.7              |
| South Scottsdale   | 2.1       | 1.9      | 1.6       | 1.6      | 1.9              |
| Tempe  | 2.5       | 2.4      | 1.9       | 1.9      | 2.4              |
| West Chandler  | 2.2       | 2.0      | 1.6       | 1.5      | 2.0              |
| West Indian School   | 5.3       | 4.5      | 5.0       | 3.9      | 4.5              |
| West Phoenix   | 5.0       | 4.6      | 4.6       | 4.1      | 4.6              |

### Conclusion

In summary, due to implemented control measures, on-road emissions are projected to continue to decline through at least 2015. Ambient monitoring data continue to show concentrations well

below the NAAQS for both the 1-hour and 8-hour CO standards. Because of the negligible change in emissions due to the current revision to the I/M program, no ambient impacts are expected. Testing of motorcycles in Area A provides little emissions reduction benefit and exemption from testing will not interfere with attainment or maintenance of the carbon monoxide air quality standards.

### **2.3 PM<sub>2.5</sub>**

This section presents regulatory background and emissions information which demonstrate that the exemption of motorcycles from the I/M program will not interfere with attainment or maintenance of the PM<sub>2.5</sub> NAAQS.

#### **Background**

Air quality standards for fine particle pollution were established in 1997. Fine particles are 2.5 micrometers in diameter and smaller and are also referred to as PM<sub>2.5</sub>. The Phoenix area was designated attainment/unclassifiable for the 1997 PM<sub>2.5</sub> air quality standards in 2005 (70 FR 944; January 5, 2005).

Although no areas of Arizona were designated nonattainment for the 1997 standard, CAA Section 110(a)(2)(D) requires adequate provisions to ensure that any source or other emissions activity within the state does not contribute significantly to nonattainment, or interfere with maintenance, of the NAAQS in any other state, or interfere with any other state's required applicable implementation plan to prevent significant deterioration of air quality or to protect visibility. ADEQ submitted *Revision to the Arizona State Implementation Plan Under Clean Air Act Section 110(a)(2)(D)(i) – Regional Transport* on May 24, 2007. This revision to the Arizona SIP addressed interstate transport of air pollution under CAA Section 110(a)(2)(D)(i) and contains a demonstration showing that Arizona does not significantly contribute to interstate transport of pollutants that impact nonattainment in, or interfere with maintenance by, any other state with respect to the 1997 PM<sub>2.5</sub> (and 8-hour ozone) air quality standards. The plan also demonstrates that Arizona meets the required prevention of significant deterioration of air quality and protection of visibility provisions of the law. EPA approved the plan in a Direct Final Rule on July 31, 2007 (72 FR 41629; July 31, 2007).

EPA strengthened the air quality standards for particle pollution in 2006, revising the 24-hour PM<sub>2.5</sub> standard from 65 µg/m<sup>3</sup> to 35 µg/m<sup>3</sup>, and retained the annual PM<sub>2.5</sub> standards at 15 µg/m<sup>3</sup>. The EPA administrator signed a final rule designating the Phoenix area attainment/unclassifiable for the 2006 24-hour PM<sub>2.5</sub> standard on December 22, 2008. Current monitoring data show that the area continues to meet the annual and 24-hour standards.

#### **PM<sub>2.5</sub> Emissions**

Oxides of nitrogen are a presumptive precursor for PM<sub>2.5</sub>. Although the Area A I/M program includes NO<sub>x</sub> testing for certain automobiles, the program does not include emissions standards or testing for motorcycles. Because of the negligible change in emissions due to the current I/M program revision, no ambient impacts are expected.

## 2.4 PM<sub>10</sub>

This section presents regulatory background and emissions information which demonstrate that the exemption of motorcycles from the I/M program will not interfere with attainment or maintenance of the PM<sub>10</sub> NAAQS.

### **Background**

Particulate matter 10 micrometers in diameter and smaller is also referred to as PM<sub>10</sub>. In 1991, EPA designated portions of Maricopa County and Pinal County as a moderate PM<sub>10</sub> nonattainment area under the Clean Air Act (CAA) Amendments of 1990. The planning area was reclassified to serious effective June 10, 1996, because it did not meet a December 31, 1994, attainment deadline (61 FR 21372; May 10, 1996).

Progress toward attainment of the PM<sub>10</sub> air quality standards has been addressed through several SIP revisions. Most recently, the *Revised MAG 1999 Serious Area Particulate Plan for PM-10 for the Maricopa County Nonattainment Area, February 2000*, was submitted to EPA on February 16, 2000. The plan contained approximately seventy-seven committed control measures from the State and local agencies designed to demonstrate attainment of the PM<sub>10</sub> standard by December 31, 2006. Due to continued exceedances, however, the *MAG 2007 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area, December 2007*, was submitted on December 21, 2007. As required under CAA Section 189(d) the plan requires the reduction of PM<sub>10</sub> emissions by at least five percent per year until the standard is attained, and no violations occur at previously violating monitors.

### **PM<sub>10</sub> Emissions**

Oxides of nitrogen are a presumptive precursor for PM<sub>2.5</sub> and a secondary contributor to PM<sub>10</sub>. Although the Area A I/M program includes NOx testing for certain automobiles, the program does not include emissions standards or testing for motorcycles. In addition, MOBILE6.2 does not assign any PM<sub>10</sub> emissions reduction credit for I/M and therefore, no modeled emissions reductions were used for credit in the Maricopa PM<sub>10</sub> planning area SIP. Because of the negligible change in emissions due to the current I/M program revision, no ambient impacts are expected.

### 3.0 DEMONSTRATING NONINTERFERENCE WITH OTHER APPLICABLE REQUIREMENTS UNDER CLEAN AIR ACT SECTION 110(I)

According to CAA Section 110(I), revisions to SIP-approved control measures must not interfere with any applicable requirement concerning attainment and reasonable further progress, or any other applicable requirement of the Clean Air Act (CAA). The analyses in Section 2.0 demonstrate that exempting Phoenix motorcycles from Arizona’s I/M program will not interfere with attainment or maintenance of the NAAQS. Sections 3.1 and 3.2, below, address the impacts of the proposed exemption on enhanced I/M program operating requirements and air toxics. Section 3.3 contains required contingency provisions under Clean Air Act Section 175A(d).

#### 3.1 Enhanced I/M Program Requirements

Requirements for I/M programs are described in 40 Code of Federal Regulations (CFR) 51.350 through 51.373. The current revisions to the Phoenix I/M program affect applicable requirements related to the enhanced I/M performance standard and vehicle coverage and exemptions.

As noted above, Arizona’s I/M programs were approved as meeting the federal requirements most recently on March 30, 2007. Arizona's I/M program includes a number of elements that are more stringent than the minimum federal program. Among these elements are requirements for a one-time-only waiver, an expanded I/M implementation area, and waiver denials for gross emitters (see ARS § 49-542(X)). Following implementation of the current program changes, the enhanced program will continue to meet or exceed the minimum federal requirements.

##### 3.1.1 Enhanced Performance Standard

An enhanced I/M program is implemented in the Phoenix metropolitan area. The Phoenix testing area, called Area A, is located in parts of Maricopa, Pinal, and Yavapai Counties. The Maricopa Association of Governments (MAG) performed an analysis to determine whether the Area A program meets the enhanced I/M performance standard as defined in 40 CFR 51.351. The emission reduction benefits associated with the Area A I/M program are required to meet or exceed the benefits associated with EPA’s performance standard. As illustrated in Table 8, MAG’s analysis demonstrates that the Phoenix area program, with exemptions fully implemented, exceeds the required alternate low enhanced I/M performance standard for the pollutants volatile organic compounds (VOC), nitrogen oxides (NO<sub>x</sub>), and carbon monoxide (CO) (see Appendix B, *Technical Support Document for Evaluating Emission Impacts of Exempting Motorcycles from Vehicle Emissions Inspections and Comparing Inspection and Maintenance (I/M) Emission Reduction Benefits in Area A with the EPA Enhanced I/M Performance Standard*).

|   | 2002       |                 |            | 2008       |                 |            |
|---|------------|-----------------|------------|------------|-----------------|------------|
|   | VOC        | NO <sub>x</sub> | CO         | VOC        | NO <sub>x</sub> | CO         |
| I/M Benefits in Area A (grams per mile) | 0.201      | 0.109           | 2.938      | 0.088      | 0.101           | 1.579      |
| I/M PS Benefits (grams per mile)        | 0.152      | 0.026           | 2.262      | 0.056      | 0.006           | 1.160      |
| <b>Meets Performance Standard?</b>      | <b>Yes</b> | <b>Yes</b>      | <b>Yes</b> | <b>Yes</b> | <b>Yes</b>      | <b>Yes</b> |

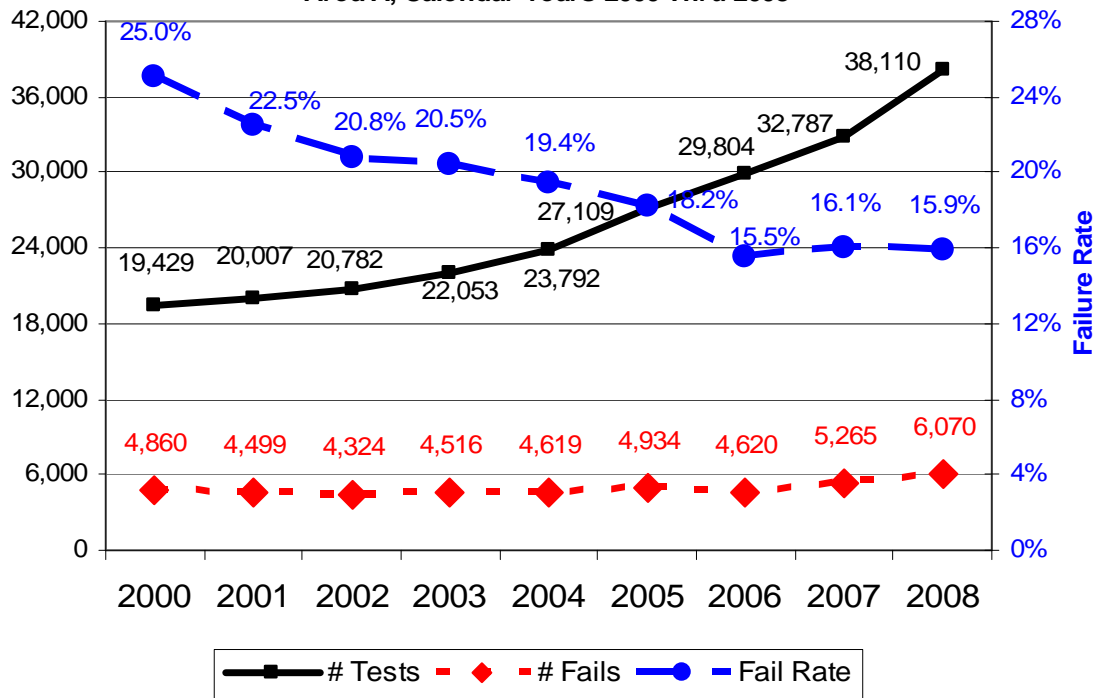
### 3.1.2 Vehicle Coverage/Exemptions

Federal regulation 40 CFR 51.356 requires that the SIP include “a description of any special exemptions which will be granted by a program, and an estimate of the percentage and number of subject vehicles which will be impacted. Such exemptions shall be accounted for in the emission reduction analysis.” The federal performance standard for enhanced I/M programs assumes coverage of all 1968 and later model year light duty vehicles and trucks. Enhanced I/M programs as outlined in the CFR are not required to test motorcycles. Motorcycles, however, are also currently tested in the Area A I/M program area.

Table 9 illustrates the number of motorcycles and initial test failures relative to the total tested fleet in Area A. Figure 3 shows recent trends in motorcycle failure rates compared to the number of motorcycles tested.

| <b>Table 9: Tested Fleet Characteristics for Calendar Years 2000 through 2008</b> |                         |   |                    |                         |   |
|---|-------------------------|---|--------------------|-------------------------|---|
| <b>Total Tests</b>  | <b>Motorcycle Tests</b> | <b>Motorcycle Tests as Percent of Total</b> | <b>Total Fails</b> | <b>Motorcycle Fails</b> | <b>Motorcycle Fails as Percent of Total</b> |
| <b>2000</b>   |                         |   |                    |                         |   |
| 761,916   | 19,429                  | 2.6%  | 141,221            | 4,860                   | 3.4%  |
| <b>2001</b>   |                         |   |                    |                         |   |
| 755,197   | 20,007                  | 2.6%  | 127,419            | 4,499                   | 3.5%  |
| <b>2002</b>   |                         |   |                    |                         |   |
| 864,046   | 20,782                  | 2.4%  | 170,557            | 4,324                   | 2.5%  |
| <b>2003</b>   |                         |   |                    |                         |   |
| 838,177   | 22,053                  | 2.6%  | 165,111            | 4,516                   | 2.7%  |
| <b>2004</b>   |                         |   |                    |                         |   |
| 909,198   | 23,792                  | 2.6%  | 170,077            | 4,619                   | 2.7%  |
| <b>2005</b>   |                         |   |                    |                         |   |
| 950,822   | 27,109                  | 2.9%  | 162,338            | 4,934                   | 3.0%  |
| <b>2006</b>   |                         |   |                    |                         |   |
| 996,648   | 29,804                  | 3.0%  | 156,873            | 4,620                   | 2.9%  |
| <b>2007</b>   |                         |   |                    |                         |   |
| 1,004,968   | 32,787                  | 3.3%  | 146,674            | 5,265                   | 3.6%  |
| <b>2008</b>   |                         |   |                    |                         |   |
| 1,027,618   | 38,110                  | 3.7%  | 137,959            | 6,070                   | 4.4%  |

**Figure 3: Total Motorcycle Tests, Initial Failures and Failure Rate  
Area A, Calendar Years 2000 Thru 2008**



While the total number of vehicles tested has grown from 2000 through 2008, the number of motorcycles tested as a percent of the total fleet has risen only slightly, from 2.6 percent in 2000 to 3.7 percent in 2008. During the same period failure rates for motorcycles have decreased significantly, from a high of 25 percent in 2000 to approximately 16 percent by 2008. The cleaner fleet and lower failure rates limit the benefits from testing these vehicles.

The performance standard evaluation in Section 3.1.1 and emissions impact analyses in Section 2.0 demonstrate that the Phoenix program meets minimum operating requirements and testing of motorcycles does not provide a significant air quality benefit and would not adversely affect attainment and maintenance of the NAAQS.

### 3.2 Air Toxics

There are no ambient air quality standards for air toxics, therefore, compliance with applicable maximum achievable control technology (MACT) standards, as well as any federal mobile source control requirements under CAA sections 112 or 202(l) demonstrate noninterference for air toxics in the program area. Motor vehicles are not subject to MACT standards and this SIP revision does not interfere with any federal mobile source control requirements that apply in the area. Arizona thus concludes that this SIP revision will not interfere with any applicable air toxics requirements of the CAA.

### 3.3 Contingency Measure Provisions

Section 175A(d) of the Clean Air Act requires that revisions to SIPs for maintenance plans must

contain contingency provisions to assure that any violation of the NAAQS will be promptly corrected. Accordingly, contingency plans should require that the state will implement all measures contained in the Part D nonattainment plan for the area prior to redesignation to attainment. States may request to remove or reduce the stringency of control measures, however, after redesignation of the area to attainment the contingency plan would have to provide for implementation of any measures that were reduced or removed (see Appendix C, *Procedures for Processing Requests to Redesignate Areas to Attainment*, John Calcagni, Director, Air Quality Management Division, EPA, memorandum dated September 4, 1992).

Because the enhanced I/M program is included as an emissions control measure for the Phoenix carbon monoxide planning area, testing of motorcycles is retained as a contingency provision under Clean Air Act §175A(d) for the Phoenix testing area.<sup>27</sup> The contingency measure proposed for this SIP revision is as follows:

“Upon approval of the motorcycle exemptions as described in *Final Arizona State Implementation Plan Revision, Exemption of Motorcycles from Vehicle Emissions Inspections and Maintenance Program Requirements in Area A, [Insert Month] 2009*, and in the event of a carbon monoxide NAAQS violation, ADEQ will request that the Arizona State Legislature reinstate emissions testing of motorcycles.

For a violation of the carbon monoxide NAAQS in the Phoenix carbon monoxide maintenance area, ADEQ will notify the Legislature by October following the violation, and request that, during the General Session in January, the Legislature enact new legislation to reinstate emissions testing of motorcycles previously exempted under the [Month] 2009 program revision in the Phoenix vehicle emissions testing area beginning January 1, the following year.”

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<sup>27</sup> See Footnote 3.

#### **4.0 CONCLUSION**

Because analyses of exempting motorcycles in Area A shows a minimal effect on emissions, significantly less than 1 metric ton per day, and represents a fraction of the overall emissions inventories in Areas A, ambient impacts are expected to be negligible. Exempting these vehicles from testing will not interfere with continued maintenance of the carbon monoxide NAAQS and does not impact the areas' ability to attain and maintain the 8-hour ozone NAAQS.

The analyses contained in this document also demonstrate that the Phoenix area I/M program will continue to meet EPA's enhanced I/M program performance standard. Additionally, this SIP revision includes required contingency provisions and demonstrates that the exemption of motorcycles will not interfere with any other requirement of the Clean Air Act.

With this submittal, ADEQ requests that the changes to Arizona's vehicle emissions inspections and maintenance program to exempt motorcycles from the Phoenix testing area, as presented in this document, be approved as a component of Arizona's SIP.

## **Appendix A**

**Amendments to Arizona Laws; Arizona Laws 2008, Chapter 64 (House Bill 2280)**



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House Engrossed  
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State of Arizona  
House of Representatives  
Forty-eighth Legislature  
Second Regular Session  
2008  
-----

CHAPTER 64  
-----

HOUSE BILL 2280  
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**AN ACT**

**AMENDING SECTION 49-542, ARIZONA REVISED STATUTES; RELATING TO VEHICLE EMISSIONS TESTING; PROVIDING FOR CONDITIONAL ENACTMENT.**

(TEXT OF BILL BEGINS ON NEXT PAGE)

Be it enacted by the Legislature of the State of Arizona:

Section 1. Section 49-542, Arizona Revised Statutes, is amended to read:

49-542. Emissions inspection program; powers and duties of director; administration; periodic inspection; minimum standards and rules; exceptions; definition

A. The director shall administer a comprehensive annual or biennial emissions inspection program which shall require the inspection of vehicles in this state pursuant to this article and applicable administrative rules. Such inspection is required in area A and area B, for those vehicles owned by a person who is subject to section 15-1444 or 15-1627 and for those vehicles registered outside of area A or area B but used to commute to the driver's principal place of employment located within area A or area B. Inspection in other counties of the state shall commence upon application by a county board of supervisors for participation in such inspection program, subject to approval by the director. In all counties with a population of three hundred fifty thousand or fewer persons according to the most recent United States decennial census, except for the portion of counties that contain any portion of area A, the director shall as conditions dictate provide for testing to determine the effect of vehicle related pollution on ambient air quality in all communities with a metropolitan area population of twenty thousand persons or more according to the most recent United States decennial census. If such testing detects the violation of state ambient air quality standards by vehicle related pollution, the director shall forward a full report of such violation to the president of the senate, the speaker of the house of representatives and the governor.

B. The state's annual or biennial emissions inspection program shall provide for vehicle inspections at official emissions inspection stations or at fleet emissions inspection stations. Each inspection station in area A shall employ at least one mechanic who is available during the station's hours of operation to provide technical advice and assistance for persons who fail the emissions test. The director may enter into agreements with the department of transportation or with county assessors for the use of official emissions inspection stations for the purpose of conducting vehicle registrations. An official or fleet emissions inspection station permit shall not be sold, assigned, transferred, conveyed or removed to another location except on such terms and conditions as the director may prescribe.

C. Vehicles required to be inspected and registered in this state, except those provided for in section 49-546, shall be inspected, for the purpose of complying with the registration or

reregistration requirement pursuant to subsection D of this section, in accordance with the provisions of this article no more than ninety days prior to each reregistration expiration date. A vehicle may be submitted voluntarily for inspection more than ninety days before the reregistration expiration date on payment of the prescribed inspection fee. Such voluntary inspection shall not be considered as compliance with the registration or reregistration requirement pursuant to subsection D of this section.

D. A vehicle shall not be registered or reregistered until such vehicle has passed the emissions inspection, the tampering inspection prescribed in subsection G of this section and the liquid fuel leak inspection prescribed in subsection Z of this section or has been issued a certificate of waiver. A certificate of waiver shall only be issued one time to a vehicle after January 1, 1997. If any vehicle to be registered or reregistered is being sold by a dealer licensed to sell motor vehicles pursuant to title 28, the cost of any inspection and any repairs necessary to pass the inspection shall be borne by the dealer. A dealer who is licensed to sell motor vehicles pursuant to title 28 and whose place of business is located in area A or area B shall not deliver any vehicle to the retail purchaser until the vehicle passes any inspection required by this article or the vehicle is exempt under subsection J of this section.

E. On the registration or reregistration of a vehicle which has complied with the minimum emissions standards pursuant to this section or is otherwise exempt under this section, the registering officer shall issue an air quality compliance sticker to the registered owner which shall be placed on the vehicle as prescribed by rule adopted by the department of transportation or issue a modified year validating tab as prescribed by rule adopted by the department of transportation. Those persons who reside outside of area A or area B but who elect to test their vehicle or are required to test their vehicle pursuant to this section and who comply with the minimum emissions standards pursuant to this section or are otherwise exempt under this section shall remit a compliance form, as prescribed by the department of transportation, and proof of compliance issued at an official emissions inspection station to the department of transportation along with the appropriate fees. The department of transportation shall then issue the person an air quality compliance sticker which shall be placed on the vehicle as prescribed by rule adopted by the department of transportation. The registering officer or the department of transportation shall collect an air quality compliance fee of twenty-five cents. The registering officer or the department of transportation shall deposit, pursuant to sections 35-146 and 35-147, the air quality compliance fee in the state highway fund established by section 28-6991. The department of transportation shall deposit, pursuant to sections 35-146 and 35-147, any emissions inspection fee in the emissions inspection fund. The provisions of this subsection do not apply to those vehicles registered pursuant to title 28, chapter 7, article 7 or 8, the sale of vehicles between motor vehicle dealers or vehicles leased to a person residing outside of area A or area B by a leasing company whose place of business is in area A or area B.

F. The director shall adopt minimum emissions standards pursuant to section 49-447 with which the various classes of vehicles shall be required to comply as follows:

1. For the purpose of determining compliance with minimum emissions standards in area B:

(a) A motor vehicle manufactured in or before the 1980 model year, other than a diesel powered vehicle, shall be required to take and pass the curb idle test condition. A diesel powered vehicle is subject to only a loaded test condition. The conditioning mode shall, at the option of the vehicle owner or owner's agent, be administered only after the vehicle has failed the curb idle test condition. Upon completion of such conditioning mode, a vehicle that has failed the curb idle test condition may be retested in the curb idle test condition. If the vehicle

passes such retest, it shall be deemed in compliance with minimum emissions standards unless the vehicle fails the tampering inspection pursuant to subsection G of this section or the liquid fuel leak inspection pursuant to subsection Z of this section.

(b) A motor vehicle manufactured in or after the 1981 model year, other than a diesel powered vehicle, shall be required to take and pass the curb idle test condition and the loaded test condition or an onboard diagnostic check as may be required pursuant to title II of the clean air act.

2. For purposes of determining compliance with minimum emissions standards and functional tests in area A:

(a) Motor vehicles manufactured in or after model year 1981 with a gross vehicle weight rating of eighty-five hundred pounds or less, other than diesel powered vehicles, shall be required to take and pass a transient loaded emissions test or an onboard diagnostic check as may be required pursuant to title II of the clean air act.

(b) Motor vehicles other than those prescribed by subdivision (a) of this paragraph and other than diesel powered vehicles shall be required to take and pass a steady state loaded test and a curb idle emissions test.

(c) A diesel powered motor vehicle applying for registration or reregistration in area A shall be required to take and pass an annual emissions test conducted at an official emissions inspection station or a fleet emissions inspection station as follows:

(i) A loaded, transient or any other form of test as provided for in rules adopted by the director for vehicles with a gross vehicle weight rating of eight thousand five hundred pounds or less.

(ii) A test that conforms with the society for automotive engineers standard J1667 for vehicles with a gross vehicle weight rating of more than eight thousand five hundred pounds.

(d) Motor vehicles by specific class or model year shall be required to take and pass any of the following tests:

(i) An evaporative system purge test.

(ii) An evaporative system integrity test.

(e) An onboard diagnostic check ~~as~~ may be required pursuant to title II of the clean air act.

3. ~~A motorcycle in area A or~~ Any constant four wheel drive vehicle shall be required to take and pass a curb idle emissions test or an onboard diagnostic check as required pursuant to title II of the clean air act.

4. Fleet operators in area B must comply with this section, except that used vehicles sold by a motor vehicle dealer who is a fleet operator and who has been issued a permit under section 49-546 shall be tested as follows:

(a) A motor vehicle manufactured in or before the 1980 model year shall take and pass only the curb idle test condition, except that a diesel powered vehicle is subject to only a loaded test condition.

(b) A motor vehicle manufactured in or after the 1981 model year shall take and pass the curb idle test condition and a twenty-five hundred revolutions per minute unloaded test condition.

5. Vehicles owned or operated by the United States, this state or a political subdivision of this state shall comply with this subsection without regard to whether those vehicles are required to be registered in this state, except that alternative fuel vehicles of a school district that is located in area A shall be required to take and pass the curb idle test condition and the loaded test condition.

6. Fleet operators in area A shall comply with this section, except that used vehicles sold by a motor vehicle dealer who is a fleet operator and who has been issued a permit pursuant to

section 49-546 for purposes of determining compliance with minimum emission standards in area A shall be tested as follows:

(a) A motor vehicle manufactured in or before the 1980 model year shall take and pass the curb idle test condition, except that a diesel powered vehicle is subject to only a loaded test condition.

(b) A motor vehicle manufactured in or after the 1981 model year shall take and pass the curb idle test condition and a two thousand five hundred revolutions per minute unloaded test condition.

7. Beginning on January 1, 2004 and except for any registered owner or lessee of a fleet of less than twenty-five vehicles, a diesel powered motor vehicle with a gross vehicle weight of more than twenty-six thousand pounds and for which gross weight fees are paid pursuant to title 28, chapter 15, article 2 in area A shall not be allowed to operate in area A unless it was manufactured in or after the 1988 model year or is powered by an engine that is certified to meet or surpass emissions standards contained in 40 Code of Federal Regulations section 86.088-11. This paragraph does not apply to vehicles that are registered pursuant to title 28, chapter 7, article 7 or 8.

8. Beginning on January 1, 2006 for any registered owner or lessee of a fleet of less than twenty-five vehicles, a diesel powered motor vehicle with a gross vehicle weight of more than twenty-six thousand pounds and for which gross weight fees are paid pursuant to title 28, chapter 15, article 2 in area A shall not be allowed to operate in area A unless it was manufactured in or after the 1988 model year or is powered by an engine that is certified to meet or surpass emissions standards contained in 40 Code of Federal Regulations section 86.088-11. This paragraph does not apply to vehicles that are registered pursuant to title 28, chapter 7, article 7 or 8.

G. In addition to an emissions inspection, a vehicle is subject to a tampering inspection on at least a biennial basis if the vehicle was manufactured after the 1974 model year and the vehicle is not subject to a transient loaded emissions test or an onboard diagnostic check as required pursuant to title II of the clean air act. The director shall adopt vehicle configuration guidelines for the tampering inspection which shall be based on the original configuration of the vehicle when manufactured. The tampering inspection shall consist of the following:

1. A visual check to determine the presence of properly installed catalytic converters.
2. An examination to determine the presence of an operational air pump.
3. In area A, if the vehicle was manufactured after the 1974 model year and is not subject to a transient loaded emissions test or an onboard diagnostic check as required pursuant to title II of the clean air act, a visual inspection for the presence or malfunction of the positive crankcase ventilation system and the evaporative control system.

H. Vehicles required to be inspected shall undergo a functional test of the gas cap to determine if the cap holds pressure within limits prescribed by the director, except for any vehicle that is subject to an evaporative system integrity test.

I. Motor vehicles failing the initial or subsequent test are not subject to a penalty fee for late registration renewal if the original testing was accomplished before the expiration date and if the registration renewal is received by the motor vehicle division or the county assessor within thirty days of the original test.

J. The director may adopt rules for purposes of implementation, administration, regulation and enforcement of the provisions of this article including:

1. The submission of records relating to the emissions inspection of vehicles inspected by another jurisdiction in accordance with another inspection law and the acceptance of such inspection for compliance with the provisions of this article.
2. The exemption from inspection of:
  - (a) A motor vehicle manufactured in or before the 1966 model year.
  - (b) New vehicles originally registered at the time of initial retail sale and titling in this state pursuant to section 28-2153 or 28-2154.
  - (c) Vehicles registered pursuant to title 28, chapter 7, article 7 or 8.
  - (d) New vehicles before the sixth registration year after initial purchase or lease.
  - (e) Vehicles which will not be available within the state during the ninety days prior to registration.
  - (f) Golf carts.
  - (g) Electrically-powered vehicles.
  - (h) Vehicles with an engine displacement of less than ninety cubic centimeters.
  - (i) The sale of vehicles between motor vehicle dealers.
  - (j) Vehicles leased to a person residing outside of area A or area B by a leasing company whose place of business is in area A or area B.
  - (k) Collectible vehicles.
  - (l) Motorcycles ~~in area B~~.
3. Compiling and maintaining records of emissions test results after servicing.
4. A procedure which shall allow the vehicle service and repair industry to compare the calibration accuracy of its emissions testing equipment with the department's calibration standards.
5. Training requirements for automotive repair personnel using emissions measuring equipment whose calibration accuracy has been compared with the department's calibration standards.
6. Any other rule which may be required to accomplish the provisions of this article.
  - K. The director ~~shall~~, after consultation with automobile manufacturers and the vehicle service and repair industry, **SHALL** establish by rule a definition of "low emissions tune-up" for motor vehicles subject to inspection under this article. The definition shall specify repair procedures which, when implemented, will reduce vehicle emissions.
  - L. The director shall adopt rules which specify that the estimated retail cost of all recommended maintenance and repairs shall not exceed the amounts prescribed in this subsection, except that if a vehicle fails a tampering inspection there is no limit on the cost of recommended maintenance and repairs. The director shall issue a certificate of waiver for a vehicle which has failed reinspection, if the director has determined that all recommended maintenance and repairs have been performed. If, after reinspection, the director has determined that the vehicle is in compliance with minimum emissions standards or that all recommended maintenance and repairs for compliance with minimum emissions standards have been performed, but that tampering discovered at a tampering inspection has not been repaired, the director may issue a certificate of waiver if the owner of the vehicle provides to the director a written statement from an automobile parts or repair business that an emissions control device which is necessary to repair the tampering is not available and cannot be obtained from any usual source of supply before the vehicle's current registration expires. Rules adopted by the director for the purpose of establishing the estimated retail cost of all recommended maintenance and repairs pursuant to this subsection shall specify that:
    1. In area A the cost shall not exceed:

(a) Five hundred dollars for a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds.

(b) Five hundred dollars for a diesel powered vehicle with tandem axles.

(c) For a vehicle other than a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds and other than a diesel powered vehicle with tandem axles:

(i) Two hundred dollars for such a vehicle manufactured in or before the 1974 model year.

(ii) Three hundred dollars for such a vehicle manufactured in the 1975 through 1979 model years.

(iii) Four hundred fifty dollars for such a vehicle manufactured in or after the 1980 model year.

2. In area B the cost shall not exceed:

(a) Three hundred dollars for a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds.

(b) Three hundred dollars for a diesel powered vehicle with tandem axles.

3. For a vehicle other than a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds and other than a diesel powered vehicle with tandem axles:

(a) Fifty dollars for such a vehicle manufactured in or before the 1974 model year.

(b) Two hundred dollars for such a vehicle manufactured in the 1975 through 1979 model years.

(c) Three hundred dollars for such a vehicle manufactured in or after the 1980 model year.

M. Each person whose vehicle has failed an emissions inspection shall be provided a list of those general recommended tune-up procedures for vehicles which are designed to reduce vehicle emissions levels. The list shall include the following notice: "This test is the result of federal law. You may wish to contact your representative in the United States Congress."

N. Notwithstanding any other provisions of this article, the director may adopt rules allowing exemptions from the requirement that all vehicles must meet the minimum standards for registration or reregistration.

O. The director of environmental quality shall establish, in cooperation with the assistant director for the motor vehicle division of the department of transportation:

1. An adequate method for identifying bona fide residents residing outside of area A or area B to ensure that such residents are exempt from compliance with the inspection program established by this article and rules adopted under this article.

2. A written notice that shall accompany the vehicle registration application forms that are sent to vehicle owners pursuant to section 28-2151 and that shall accompany or be included as part of the vehicle emissions test results that are provided to vehicle owners at the time of the vehicle emissions test. This written notice shall describe at least the following:

(a) The restriction of the waiver program to one time per vehicle and a brief description of the implications of this limit.

(b) The availability and a brief description of the vehicle repair and retrofit program established pursuant to section 49-474.03.

(c) Notice that many vehicles carry extended warranties for vehicle emissions systems, and those warranties are described in the vehicle's owner's manual or other literature.

(d) A description of the catalytic converter replacement program established pursuant to section 49-474.03.

P. Notwithstanding any other law, if area A or area B is reclassified as an attainment area, emissions testing conducted pursuant to this article shall continue for vehicles registered inside that reclassified area, vehicles owned by a person who is subject to section 15-1444 or

15-1627 and vehicles registered outside of that reclassified area but used to commute to the driver's principal place of employment located within that reclassified area.

Q. A fleet operator who is issued a permit pursuant to section 49-546 may electronically transmit emissions inspection data to the department of transportation pursuant to rules adopted by the director of the department of transportation in consultation with the director of environmental quality.

R. The director shall prohibit a certificate of waiver pursuant to subsection L of this section for any vehicle which has failed inspection in area A due to the catalytic converter system.

S. The director shall establish provisions for rapid testing of certain vehicles and to allow fleet operators, singly or in combination, to contract directly for vehicle emissions testing.

T. Each vehicle emissions control station in area A shall have a sign posted to be visible to persons who are having their vehicles tested. This sign shall state that enhanced testing procedures are a direct result of federal law.

U. The initial adoption of rules pursuant to this section shall be deemed emergency rules pursuant to section 41-1026.

V. The director of environmental quality and the director of the department of transportation shall implement a system to exchange information relating to the waiver program, including information relating to vehicle emissions test results and vehicle registration information.

W. Any person who sells a vehicle that has been issued a certificate of waiver pursuant to this section after January 1, 1997 and who knows that a certificate of waiver has been issued after January 1, 1997 for that vehicle shall disclose to the buyer before completion of the sale that a certificate of waiver has been issued for that vehicle.

X. Vehicles that fail the emissions test at emission levels higher than twice the standard established for that vehicle class by the department pursuant to section 49-447 are not eligible for a certificate of waiver pursuant to this section unless the vehicle is repaired sufficiently to achieve an emissions level below twice the standard for that class of vehicle.

Y. If an insurer notifies the department of transportation of the cancellation or nonrenewal of collectible vehicle or classic automobile insurance coverage for a collectible vehicle, the department of transportation shall cancel the registration of the vehicle and the vehicle's exemption from emissions testing pursuant to this section unless evidence of coverage is presented to the department of transportation within sixty days.

Z. In addition to an emissions inspection, a vehicle is subject to a liquid fuel leak inspection on at least a biennial basis if the vehicle was manufactured after the 1974 model year and is not a diesel vehicle. The director shall adopt rules prescribing procedures and standards for the liquid fuel leak inspection.

AA. For the purposes of this section, "collectible vehicle" means a vehicle that complies with both of the following:

1. Either:

(a) Bears a model year date of original manufacture that is at least fifteen years old.

(b) Is of unique or rare design, of limited production and an object of curiosity.

2. Meets both of the following criteria:

(a) Is maintained primarily for use in car club activities, exhibitions, parades or other functions of public interest or for a private collection and is used only infrequently for other purposes.

(b) Has a collectible vehicle or classic automobile insurance coverage that restricts the collectible vehicle mileage or use, or both, and requires the owner to have another vehicle for personal use.

Sec. 2. [Conditional enactment: notice](#)

A. Section 49-542, Arizona Revised Statutes, as amended by this act, does not become effective unless on or before July 1, 2010 the United States environmental protection agency issues a vehicle emissions testing exemption for motorcycles in area A for purposes of the state implementation or maintenance plan for air quality.

B. The director of the department of environmental quality shall promptly notify in writing the director of the Arizona legislative council of the date on which the condition prescribed in subsection A of this section is met or if the condition is not met.

APPROVED BY THE GOVERNOR APRIL 22, 2008.

FILED IN THE OFFICE OF THE SECRETARY OF STATE APRIL 22, 2008.

## **Appendix B**

***Technical Support Document for Evaluating Emission Impacts of Exempting Motorcycles from Vehicle Emissions Inspections and Comparing Inspection and Maintenance (I/M) Emission Reduction Benefits in Area A with the EPA Enhanced I/M Performance Standard, Maricopa Association of Governments, August 19, 2009***



**Technical Support Document for Evaluating Emission Impacts of  
Exempting Motorcycles from Vehicle Emissions Inspections and  
Comparing Inspection and Maintenance (I/M) Emission Reduction Benefits  
in Area A with the EPA Enhanced I/M Performance Standard**

**Introduction**

House Bill 2280 (HB 2280) was passed by the Arizona Legislature in 2008. This bill included a vehicle emissions inspection (VEI) exemption for motorcycles in Area A from the requirement to take and pass a curb idle emissions test or an onboard diagnostic check as required by the Clean Air Act. The purpose of this document is to verify that the motorcycle exemption from the Inspection and Maintenance (I/M) program does not exert any significant negative air quality impacts in Area A, and that the State Implementation Plan (SIP) requirements are satisfied with the motorcycle exemption. The analysis for the motorcycle exemption was performed using MOBILE6.2 for two seasons – summer for hydrocarbons (HC) and nitrogen oxides (NOx) and winter for carbon monoxide (CO), as required by EPA.

**Emission Impacts of Exempting Motorcycles from the I/M Program in Area A**

The purpose of this section is to assess the impacts of exempting motorcycles from the I/M program in Area A. In Area A, non-diesel light duty vehicles (LDVs) of 1980 model year and older, non-diesel full time 4-wheel drive LDVs of 1995 model year and older, and motorcycles (MCs) are subject to the same type of I/M test, the idle test. Since MOBILE6.2 is not designed to simulate an I/M program for motorcycles, the I/M estimates for LDVs are used to derive the I/M benefits for motorcycles. The I/M benefits for motorcycles were estimated by using a relative increase of LDV and a correction factor, which was calculated through the emissions test data analysis. The method to derive the correction factor is explained in Methodology section of this document. The year 2010 was selected to estimate the emissions impact in the year that the I/M “waiver” for motorcycles would take effect (EPA, 2008).

**Methodology**

Table 1 summarizes the MOBILE6.2 inputs for this analysis.

**Table 1. MOBILE6.2 inputs**

| <b>Input Parameters</b>   | <b>Area A</b>  |
|---------------------------|--|
| Calendar Year             | 2010   |
| Evaluation Month          | July for Summer; January for Winter  |
| Altitude                  | Low altitude   |
| Min/Max temperatures (°F) | 75.5/102.5 for Summer; 49.2/72.6 for Winter  |
| Fuel RVP (psi)            | 7.0 for Summer; 9.0 for Winter<br>Source: Caps from ARS §41-2083; MAG CO and ozone plans |

| Input Parameters  | Area A  |
|---|---|
| Fuel Program  | A reformulated gasoline program for a southern region for Summer; User-supplied gasoline sulfur levels for Winter |
| I/M Program Stringency - Expected failure rate  | 28%<br>Source: VEI statistics   |
| I/M Program Compliance Rate – Proportion of fleet complying with program requirements | 97%   |
| Registration Distribution   | ADOT July 2009 Maricopa County registration data (Appendix 1)   |
| I/M Program   | Required under ARS §49-542  |
| Daily Vehicle Miles Traveled (VMT) in Area A  | 97,488,505 miles/day<br>Source: MAG travel demand model   |

Motorcycle I/M Impact Calculation Steps:

1. Run MOBILE6.2 model for four scenarios, which are I/M and No I/M for summer (HC and NOx) and winter (CO). Since motorcycles are required to do the “Idle Only” test in Area A, MOBILE6.2 modeling was conducted using one I/M program with the “Idle Only” test. MOBILE6.2 input and output files for these four scenarios are presented in Appendices 2 and 3, respectively.
2. Determine the relative increase in emission rate for LDV ( $LDV_{increase}$ ) for each pollutant due to the I/M exemption as follows:

$$LDV_{increase} = \frac{LDV_{NoIM} - LDV_{IM}}{LDV_{NoIM}}$$

where,  $LDV_{increase}$  = relative increase in emission rate for LDV due to the exemption of the I/M program with the “Idle Only” test in Area A,

$LDV_{NoIM}$  = LDV emission factor without the I/M program, “Idle Only”, and

$LDV_{IM}$  = LDV emission factor with the I/M program, “Idle Only”.

**Table 2. LDV emission factors (g/mile)**

|  | HC    | NOx   | CO    |
|--|-------|-------|-------|
| I/M ( $LDV_{IM}$ )                       | 0.658 | 0.567 | 7.320 |
| No I/M ( $LDV_{NoIM}$ )                  | 0.710 | 0.571 | 8.630 |
| Relative I/M Impact ( $LDV_{increase}$ ) | 7.3%  | 0.7%  | 15.2% |

3. Derive the correction factors using the 2002-2007 emissions test data (ADEQ, 2008) as follows:
  - a. Extract the 2002 HC emissions test data for LDVs and MCs.
  - b. Calculate the ratios of excess emissions to the emission cutpoints for LDVs and MCs as follows:

$$(EX_{LDV})_{t,n} = \frac{(EFAIL_{LDV})_{t,n} - (C_{LDV})_{t,n}}{(C_{LDV})_{t,n}}$$

$$(EX_{MC})_{t,n} = \frac{(EFAIL_{MC})_{t,n} - (C_{MC})_{t,n}}{(C_{MC})_{t,n}}$$

where,  $(EX_{LDV})_{t,n}$  = ratio of excess emissions to the emission cutpoints for LDV for a given model year ( $t$ ) and test failed ( $n$ ),

$(EX_{MC})_{t,n}$  = ratio of excess emissions to the emission cutpoints for MC for a given model year ( $t$ ) and test failed ( $n$ ),

$(EFAIL_{LDV})_{t,n}$  = measured emissions from failed LDV for a given model year ( $t$ ) and test failed ( $n$ ),

$(EFAIL_{MC})_{t,n}$  = measured emissions from failed MC for a given model year ( $t$ ) and test failed ( $n$ ),

$(C_{LDV})_{t,n}$  = the emission cutpoints for LDV for a given model year ( $t$ ) and test failed ( $n$ ), and

$(C_{MC})_{t,n}$  = the emission cutpoints for MC for a given model year ( $t$ ) and test failed ( $n$ ).

- c. Average the ratios of excess emissions to the emission cutpoints for LDVs and MCs:

$$(EX_{LDV-avg})_t = \frac{\sum_{n=1}^{(NFAIL_{LDV})_t} (EX_{LDV})_{t,n}}{(NFAIL_{LDV})_t}$$

$$(EX_{MC-avg})_t = \frac{\sum_{n=1}^{(NFAIL_{MC})_t} (EX_{MC})_{t,n}}{(NFAIL_{MC})_t}$$

where,  $(EX_{LDV-avg})_t$  = average ratio of excess emissions from failed LDVs for a given model year ( $t$ ),

$(EX_{MC-avg})_t$  = average ratio of excess emissions from failed MCs for a given model year ( $t$ ),

$(NFAIL_{LDV})_t$  = the number of failed LDV tests for a given model year ( $t$ ), and

$(NFAIL_{MC})_t$  = the number of failed MC tests for a given model year ( $t$ ).

- d. Calculate a motorcycle fraction  $(F_{MC})_t$ , which is a ratio of  $(EX_{MC-avg})_t$  to  $(EX_{LDV-avg})_t$ , by model year  $(t)$  as follows:

$$(F_{MC})_t = \frac{(EX_{MC-avg})_t}{(EX_{LDV-avg})_t}$$

- e. Weight the motorcycle fraction by the number of failed MCs for a given model year  $(t)$  as follows:

$$(WF_{MC})_t = (F_{MC})_t \times \frac{(NFAIL_{MC})_t}{(NFAIL_{MC-total})}$$

where,  $(WF_{MC})_t$  = motorcycle fraction weighted by the number of failed MCs for a given model year  $(t)$ , and

$NFAIL_{MC-total}$  = the number of total MCs failed for the model years equal to or older than five years old<sup>1</sup>.

- f. Sum all weighted motorcycle fractions for the model years equal to or older than five years old to calculate the correction factor  $(CF)$  as follows:

$$CF = \sum_{t=1967}^{Y_{VEI}-5} (WF_{MC})_t$$

where,  $Y_{VEI}$  = emissions test year.

- g. Repeat Steps a through f to calculate correction factors for CO.  
 h. Repeat Steps a through g to calculate correction factors for other emissions test years from 2003 through 2007.

**Table 3. Correction factors for each emissions test year (2002~2007)**

| Emissions Test Year | HC   | NOx <sup>2</sup> | CO   |
|---------------------|------|------------------|------|
| 2002                | 0.63 | 0.63             | 0.60 |
| 2003                | 0.80 | 0.80             | 0.29 |
| 2004                | 0.53 | 0.53             | 0.35 |
| 2005                | 0.38 | 0.38             | 0.32 |
| 2006                | 0.62 | 0.62             | 0.15 |
| 2007                | 0.29 | 0.29             | 0.12 |
| Average             | 0.54 | 0.54             | 0.31 |

<sup>1</sup> Current exempted vehicles from the I/M program in Arizona include automobiles less than five years old and automobiles made before 1967.

<sup>2</sup> Since NOx emissions test data for motorcycles are not provided and emissions standards for motorcycles are set for HC or HC + NOx, the correction factor for HC was used for NOx.

- i. Average correction factors for the six emissions test years were used as correction factors for the 2010 evaluation year.
4. Multiply the MOBILE6.2 motorcycles emission factors by the correction factor and the relative increase of HC, NOx, and CO emission factors for LDV to calculate an I/M impact of motorcycles ( $MC_{increase}$ ):

$$MC_{increase} = LDV_{increase} \times CF \times MC_{NoIM}$$

where,  $MC_{increase}$  = an I/M impact of motorcycles, and  
 $MC_{NoIM}$  = MOBILE6.2 motorcycles emission factors without the I/M program (3.16 g/mile for HC, 1.14 g/mile for NOx, and 11.66 g/mile for CO)<sup>3</sup>.

**Table 4. I/M impact of motorcycles (g/mile)**

|                           | HC     | NOx    | CO     |
|---------------------------|--------|--------|--------|
| I/M Impact of Motorcycles | 0.1250 | 0.0043 | 0.5487 |

5. Calculate mass emission increases by the motorcycle I/M exemption as follows:

$$EI_{MC} = MC_{increase} \times VD_{MC} \times VMT_{total}$$

where,  $EI_{MC}$  = mass emission increase by the exemption of motorcycles from the I/M program in Area A,  
 $VD_{MC}$  = vehicle miles traveled (VMT) distribution for motorcycles (0.0046)<sup>4</sup>, and  
 $VMT_{total}$  = daily total VMT in Area A (97,488,505 miles/day)<sup>5</sup>.

**Table 5. Mass emission increases due to the exemption of motorcycles from the I/M program in Area A (mtons\*/day)**

|                         | HC     | NOx    | CO     |
|-------------------------|--------|--------|--------|
| Mass Emission Increases | 0.0560 | 0.0019 | 0.2461 |

\* mtons indicates metric tons.

6. Calculate increases expressed as a percentage of area-wide onroad emissions as follows:

$$Relative\ Increases = \frac{EI_{MC}}{E_{total}} \times 100$$

where,  $E_{total}$  = total onroad emissions in Area A obtained from emissions inventory.

<sup>3</sup> Motorcycles emission factors were provided by MOBILE6.2 model results as shown in Appendix 3.

<sup>4</sup> VMT distribution for motorcycles was provided by MOBILE6.2 model results as shown in Appendix 3.

<sup>5</sup> Daily total VMT in Area A in 2010 was estimated by the MAG travel demand model.

**Table 6. Relative emission increases due to the exemption of motorcycles from the I/M program in Area A in 2010**

|  | <b>HC</b> | <b>NO<sub>x</sub></b> | <b>CO</b> |
|--|-----------|-----------------------|-----------|
| I/M Benefit (in mtons/day)                         | 0.0560    | 0.0019                | 0.2461    |
| Total Onroad Emissions (in mtons/day) <sup>6</sup> | 66.58     | 113.06                | 593.27    |
| Relative Increases                                 | 0.084%    | 0.002%                | 0.041%    |

7. Calculate impact of the motorcycle I/M exemption on total emissions.

**Table 7. Impact of the I/M exemption of motorcycles on total emissions in the eight-hour ozone nonattainment area in 2010**

|   | <b>HC</b> | <b>NO<sub>x</sub></b> | <b>CO</b> |
|---|-----------|-----------------------|-----------|
| I/M Benefit (in mtons/day)                  | 0.0560    | 0.0019                | 0.2461    |
| Total Emissions (in mtons/day) <sup>7</sup> | 606.69    | 327.02                | 3,880.96  |
| Relative Increases                          | 0.0092%   | 0.0006%               | 0.0063%   |

### **Results**

The I/M impact due to the exemption of motorcycles from the I/M program in Area A in 2010 is an increase of less than 0.3 metric tons per day for HC, NO<sub>x</sub>, and CO and onroad and total emissions are increased by less than 0.1% and 0.01% for all pollutants, respectively.

<sup>6</sup> Annual average day onroad mobile source emissions for Area A in 2010 were derived by the same methodology applied for the 2005 PEI onroad emissions preparation with the 2010 average day VMT for Area A (97,488,505 miles/day) of the MAG travel demand model for the 2008 conformity analysis and the 2010 MOBILE6.2 model results.

<sup>7</sup> Total emissions (anthropogenic and biogenic emissions) for the eight-hour ozone nonattainment area are obtained from the 2005 Periodic Emission Inventory for Ozone Precursors (MCAQD, 2008). The eight-hour ozone nonattainment area (4,880 square miles) is slightly larger than Area A (4,520 square miles).

## **Comparison with the EPA Enhanced I/M Performance Standard**

The objective of the analysis in this section is to demonstrate that the I/M program in Area A meets EPA's enhanced I/M performance standard, as defined in 40 CFR Part 51.351. In order to meet the EPA performance standard, the emission reduction benefits associated with the I/M program in Area A should be  $\pm 0.02$  grams per mile or greater than the benefits associated with the EPA performance standard. The emission reduction benefits for the I/M program in Area A and the EPA performance standard were calculated by comparing emission factors in grams per mile with and without the I/M program.

Because the Maricopa County Nonattainment Area is no longer classified as Serious for any pollutant and also satisfies other requirements of Part 51.351(g), the analysis performed here compares the I/M programs in Area A in 2002 and 2008 with the Alternate Low Enhanced I/M Performance Standard. The specifications for the Alternate Low Enhanced I/M Standard are described under Part 51.351(g). HC, NO<sub>x</sub>, and CO emission rates in grams per mile (gpm) were developed using MOBILE6.2 for the calendar years 2002 and 2008.

The year 2008 was chosen for the analysis, because it is the date that was modeled to demonstrate attainment of the 1997 eight-hour ozone standard for the Maricopa County Nonattainment Area (MAG, 2007). The year 2002 was also modeled as required in Part 51.351(g)(13).

### ***Methodology***

The I/M and anti-tampering (ATP) criteria promulgated in 40 CFR Part 51 Subpart S for the "Alternate low enhanced I/M performance standard" were employed to set up the MOBILE6.2 I/M inputs for estimating the performance standard benefit. The specifications for the performance standard for one I/M program and two ATP programs are listed in Table 8.

The MOBILE6.2 input and output files for 2002 and 2008 are provided in Appendices 4 and 5, respectively. Since MOBILE6.2 does not estimate credits for the IM147 program that is in place in Area A, the IM240 program was simulated with the methodology and cutpoints provided by ADEQ (ADEQ, 2001). The 2002 and 2008 I/M cutpoints are presented in Appendix 6 and the vehicle registration data used for 2002 and 2008 are presented in Appendix 7.

**Table 8. Specifications for the performance standard**

| Program | Specifications   |
|---------|--|
| I/M     | <ol style="list-style-type: none"> <li>1) Centralized, Annual, Idle Exhaust Test I/M program starting 1983</li> <li>2) Testing of 1968 and newer vehicles</li> <li>3) Covers light duty vehicles and light duty trucks rated up to 8,500 lbs GVWR</li> <li>4) Stringency 20%</li> <li>5) Waiver rate 3%</li> <li>6) Compliance rate 96%</li> </ol> |
| ATP1    | <ol style="list-style-type: none"> <li>1) Visual inspection of the Positive Crankcase Ventilation (PCV) valve</li> <li>2) Inspection of 1968 through 1971 model year vehicles</li> <li>3) Covers light duty vehicles and light duty trucks rated up to 8,500 lbs GVWR</li> <li>4) Compliance rate 96%</li> </ol>                                   |
| ATP2    | <ol style="list-style-type: none"> <li>1) Visual inspection of the Exhaust Gas Recirculation (EGR) valve</li> <li>2) Inspection of 1972 and newer model year vehicles</li> <li>3) Covers light duty vehicles and light duty trucks rated up to 8,500 lbs GVWR</li> <li>4) Compliance rate 96%</li> </ol>   |

Emission reduction benefits for the I/M programs and performance standard were calculated as follows:

$$\begin{aligned}
 \text{I/M program benefit} &= EF_{NoIM} - EF_{IM} \\
 \text{Performance standard (PS) benefit} &= EF_{NoIM} - EF_{PS}
 \end{aligned}$$

where,  $EF_{NoIM}$  = emission factor without the I/M program,

$EF_{IM}$  = emission factor with the I/M program excluding the motorcycle I/M, and

$EF_{PS}$  = emission factor with the performance standard.

**Table 9. Emission factors (g/mile)**

|                          | 2002  |       |        | 2008  |       |       |
|--------------------------|-------|-------|--------|-------|-------|-------|
|                          | HC    | NOx   | CO     | HC    | NOx   | CO    |
| I/M in Area A            | 1.351 | 2.669 | 11.611 | 0.818 | 1.474 | 8.316 |
| I/M Performance Standard | 1.400 | 2.752 | 12.287 | 0.850 | 1.569 | 8.735 |
| No I/M                   | 1.552 | 2.778 | 14.549 | 0.906 | 1.575 | 9.895 |

**Table 10. Comparison of I/M Benefits between Area A and EPA Performance Standard (g/mile)**

|                          | 2002       |            |            | 2008       |            |            |
|--------------------------|------------|------------|------------|------------|------------|------------|
|                          | HC         | NOx        | CO         | HC         | NOx        | CO         |
| I/M in Area A            | 0.201      | 0.109      | 2.938      | 0.088      | 0.101      | 1.579      |
| I/M Performance Standard | 0.152      | 0.026      | 2.262      | 0.056      | 0.006      | 1.160      |
| <b>Meet PS standard?</b> | <b>Yes</b> | <b>Yes</b> | <b>Yes</b> | <b>Yes</b> | <b>Yes</b> | <b>Yes</b> |

## ***Results***

As shown in Tables 9 and 10, the I/M emission reduction benefits in Area A are at least 0.04 grams/mile higher than the emission reduction benefits of the performance standard for all three pollutants in 2002. In 2008 the I/M emission reduction benefits in Area A are also at least 0.03 grams/mile higher than the emission reduction benefits of the performance standard for all three pollutants. Therefore, it can be concluded that the I/M programs in Area A in 2002 and 2008 meet the EPA alternative low enhanced I/M performance standard.

## **References**

ADEQ, 2001. Memorandum from Peter Hyde, “Cutpoints for IM147 for MOBILE6”, May 28, 2001.

ADEQ, 2008. Arizona VEI test record in Area A from Hui Chen at ADEQ, December 5, 2008.

EPA, 2008. E-mail correspondence with Wienke Tax at EPA Region IX, December 19, 2008.

MAG, 2007. “Eight-Hour Ozone Plan for the Maricopa Nonattainment Area”, June 2007.

MCAQD, 2008. “2005 Periodic Emission Inventory for Ozone Precursors”, September 2008.

# Appendix 1 -- 2010 Vehicle Registration Data

| 2010 Vehicle Registration (097Reg10.D) |        |        |        |        |        |        |        |        |        |        |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| REG DIST                               |        |        |        |        |        |        |        |        |        |        |
| * LDV                                  |        |        |        |        |        |        |        |        |        |        |
| 1                                      | 0.0322 | 0.0735 | 0.0886 | 0.0882 | 0.0837 | 0.0756 | 0.0705 | 0.0669 | 0.0629 | 0.0599 |
|  | 0.0511 | 0.0397 | 0.0357 | 0.0271 | 0.0264 | 0.0203 | 0.0161 | 0.0126 | 0.0109 | 0.0089 |
|  | 0.0072 | 0.0054 | 0.0046 | 0.0037 | 0.0284 |        |        |        |        |        |
| * LDT1                                 |        |        |        |        |        |        |        |        |        |        |
| 2                                      | 0.0097 | 0.0508 | 0.0721 | 0.0827 | 0.0716 | 0.0795 | 0.0690 | 0.0656 | 0.0741 | 0.0632 |
|  | 0.0508 | 0.0426 | 0.0442 | 0.0310 | 0.0305 | 0.0279 | 0.0179 | 0.0127 | 0.0112 | 0.0096 |
|  | 0.0104 | 0.0078 | 0.0061 | 0.0078 | 0.0511 |        |        |        |        |        |
| * LDT2                                 |        |        |        |        |        |        |        |        |        |        |
| 3                                      | 0.0097 | 0.0508 | 0.0721 | 0.0827 | 0.0716 | 0.0795 | 0.0690 | 0.0656 | 0.0741 | 0.0632 |
|  | 0.0508 | 0.0426 | 0.0442 | 0.0310 | 0.0305 | 0.0279 | 0.0179 | 0.0127 | 0.0112 | 0.0096 |
|  | 0.0104 | 0.0078 | 0.0061 | 0.0078 | 0.0511 |        |        |        |        |        |
| * LDT3                                 |        |        |        |        |        |        |        |        |        |        |
| 4                                      | 0.0708 | 0.1193 | 0.1054 | 0.1071 | 0.0796 | 0.0629 | 0.0514 | 0.0372 | 0.0479 | 0.0494 |
|  | 0.0367 | 0.0273 | 0.0274 | 0.0221 | 0.0225 | 0.0193 | 0.0144 | 0.0103 | 0.0080 | 0.0087 |
|  | 0.0109 | 0.0093 | 0.0037 | 0.0050 | 0.0435 |        |        |        |        |        |
| * LDT4                                 |        |        |        |        |        |        |        |        |        |        |
| 5                                      | 0.0708 | 0.1193 | 0.1054 | 0.1071 | 0.0796 | 0.0629 | 0.0514 | 0.0372 | 0.0479 | 0.0494 |
|  | 0.0367 | 0.0273 | 0.0274 | 0.0221 | 0.0225 | 0.0193 | 0.0144 | 0.0103 | 0.0080 | 0.0087 |
|  | 0.0109 | 0.0093 | 0.0037 | 0.0050 | 0.0435 |        |        |        |        |        |
| * HDV2B                                |        |        |        |        |        |        |        |        |        |        |
| 6                                      | 0.0633 | 0.0980 | 0.1470 | 0.1605 | 0.0918 | 0.0540 | 0.0319 | 0.0197 | 0.0250 | 0.0661 |
|  | 0.0413 | 0.0333 | 0.0444 | 0.0309 | 0.0257 | 0.0154 | 0.0131 | 0.0044 | 0.0047 | 0.0051 |
|  | 0.0047 | 0.0035 | 0.0023 | 0.0026 | 0.0114 |        |        |        |        |        |
| * HDV3                                 |        |        |        |        |        |        |        |        |        |        |
| 7                                      | 0.0633 | 0.0980 | 0.1470 | 0.1605 | 0.0918 | 0.0540 | 0.0319 | 0.0197 | 0.0250 | 0.0661 |
|  | 0.0413 | 0.0333 | 0.0444 | 0.0309 | 0.0257 | 0.0154 | 0.0131 | 0.0044 | 0.0047 | 0.0051 |
|  | 0.0047 | 0.0035 | 0.0023 | 0.0026 | 0.0114 |        |        |        |        |        |
| * HDV4                                 |        |        |        |        |        |        |        |        |        |        |
| 8                                      | 0.0633 | 0.0980 | 0.1470 | 0.1605 | 0.0918 | 0.0540 | 0.0319 | 0.0197 | 0.0250 | 0.0661 |
|  | 0.0413 | 0.0333 | 0.0444 | 0.0309 | 0.0257 | 0.0154 | 0.0131 | 0.0044 | 0.0047 | 0.0051 |
|  | 0.0047 | 0.0035 | 0.0023 | 0.0026 | 0.0114 |        |        |        |        |        |
| * HDV5                                 |        |        |        |        |        |        |        |        |        |        |
| 9                                      | 0.0633 | 0.0980 | 0.1470 | 0.1605 | 0.0918 | 0.0540 | 0.0319 | 0.0197 | 0.0250 | 0.0661 |
|  | 0.0413 | 0.0333 | 0.0444 | 0.0309 | 0.0257 | 0.0154 | 0.0131 | 0.0044 | 0.0047 | 0.0051 |
|  | 0.0047 | 0.0035 | 0.0023 | 0.0026 | 0.0114 |        |        |        |        |        |
| * HDV6                                 |        |        |        |        |        |        |        |        |        |        |
| 10                                     | 0.0633 | 0.0980 | 0.1470 | 0.1605 | 0.0918 | 0.0540 | 0.0319 | 0.0197 | 0.0250 | 0.0661 |
|  | 0.0413 | 0.0333 | 0.0444 | 0.0309 | 0.0257 | 0.0154 | 0.0131 | 0.0044 | 0.0047 | 0.0051 |
|  | 0.0047 | 0.0035 | 0.0023 | 0.0026 | 0.0114 |        |        |        |        |        |
| * HDV7                                 |        |        |        |        |        |        |        |        |        |        |
| 11                                     | 0.0633 | 0.0980 | 0.1470 | 0.1605 | 0.0918 | 0.0540 | 0.0319 | 0.0197 | 0.0250 | 0.0661 |
|  | 0.0413 | 0.0333 | 0.0444 | 0.0309 | 0.0257 | 0.0154 | 0.0131 | 0.0044 | 0.0047 | 0.0051 |
|  | 0.0047 | 0.0035 | 0.0023 | 0.0026 | 0.0114 |        |        |        |        |        |
| * HDV8A                                |        |        |        |        |        |        |        |        |        |        |
| 12                                     | 0.0633 | 0.0980 | 0.1470 | 0.1605 | 0.0918 | 0.0540 | 0.0319 | 0.0197 | 0.0250 | 0.0661 |
|  | 0.0413 | 0.0333 | 0.0444 | 0.0309 | 0.0257 | 0.0154 | 0.0131 | 0.0044 | 0.0047 | 0.0051 |
|  | 0.0047 | 0.0035 | 0.0023 | 0.0026 | 0.0114 |        |        |        |        |        |
| * HDV8B                                |        |        |        |        |        |        |        |        |        |        |
| 13                                     | 0.0633 | 0.0980 | 0.1470 | 0.1605 | 0.0918 | 0.0540 | 0.0319 | 0.0197 | 0.0250 | 0.0661 |
|  | 0.0413 | 0.0333 | 0.0444 | 0.0309 | 0.0257 | 0.0154 | 0.0131 | 0.0044 | 0.0047 | 0.0051 |
|  | 0.0047 | 0.0035 | 0.0023 | 0.0026 | 0.0114 |        |        |        |        |        |
| * HDBS                                 |        |        |        |        |        |        |        |        |        |        |
| 14                                     | 0.0633 | 0.0980 | 0.1470 | 0.1605 | 0.0918 | 0.0540 | 0.0319 | 0.0197 | 0.0250 | 0.0661 |
|  | 0.0413 | 0.0333 | 0.0444 | 0.0309 | 0.0257 | 0.0154 | 0.0131 | 0.0044 | 0.0047 | 0.0051 |
|  | 0.0047 | 0.0035 | 0.0023 | 0.0026 | 0.0114 |        |        |        |        |        |
| * HDBT                                 |        |        |        |        |        |        |        |        |        |        |
| 15                                     | 0.0407 | 0.0678 | 0.1447 | 0.1505 | 0.1037 | 0.0613 | 0.0414 | 0.0315 | 0.0421 | 0.0555 |
|  | 0.0540 | 0.0305 | 0.0289 | 0.0291 | 0.0271 | 0.0218 | 0.0111 | 0.0075 | 0.0072 | 0.0105 |
|  | 0.0093 | 0.0065 | 0.0045 | 0.0034 | 0.0094 |        |        |        |        |        |
| * Motorcycles                          |        |        |        |        |        |        |        |        |        |        |
| 16                                     | 0.0452 | 0.0917 | 0.1221 | 0.1233 | 0.0995 | 0.0648 | 0.0699 | 0.0561 | 0.0493 | 0.0404 |
|  | 0.0331 | 0.0254 | 0.0199 | 0.0184 | 0.0153 | 0.0115 | 0.0109 | 0.0076 | 0.0055 | 0.0053 |
|  | 0.0056 | 0.0050 | 0.0052 | 0.0081 | 0.0610 |        |        |        |        |        |

## Appendix 2 -- MOBILE6.2 Input Files for motorcycles I/M Emission Reduction Benefits in Area A

| Summer 2010 (HC and NOx) |  |
|--------------------------|--|
| I/M                      | <pre> MOBILE6 INPUT FILE : POLLUTANTS          : HC NOX WITH FIELDNAMES     : DAILY OUTPUT        :  RUN DATA  I/M PROGRAM          : 1 1977 2050 1 T/O IDLE I/M MODEL YEARS     : 1 1967 2050 I/M VEHICLES         : 1 21111 11111111 1 I/M STRINGENCY      : 1 28.0 I/M COMPLIANCE      : 1 97.0 I/M WAIVER RATES    : 1 1.3 1.0  REG DIST             : 097Reg10.D  SCENARIO RECORD     : I/M Scenario CALENDAR YEAR       : 2010 EVALUATION MONTH    : 7 ALTITUDE             : 1 MIN/MAX TEMP        : 75.5 102.5 FUEL RVP             : 7.0 FUEL PROGRAM        : 2 S  END OF RUN </pre> |
| No I/M                   | <pre> MOBILE6 INPUT FILE : POLLUTANTS          : HC NOX WITH FIELDNAMES     : DAILY OUTPUT        :  RUN DATA  REG DIST             : 097Reg10.D  SCENARIO RECORD     : I/M Scenario CALENDAR YEAR       : 2010 EVALUATION MONTH    : 7 ALTITUDE             : 1 MIN/MAX TEMP        : 75.5 102.5 FUEL RVP             : 7.0 FUEL PROGRAM        : 2 S  END OF RUN </pre>  |

**Winter 2010 (CO)**

|        |   |
|--------|---|
| I/M    | <pre> MOBILE6 INPUT FILE : POLLUTANTS          : CO WITH FIELDNAMES     : DAILY OUTPUT        :  RUN DATA  I/M PROGRAM          : 1 1977 2050 1 T/O IDLE I/M MODEL YEARS      : 1 1967 2050 I/M VEHICLES         : 1 21111 11111111 1 I/M STRINGENCY       : 1 28.0 I/M COMPLIANCE       : 1 97.0 I/M WAIVER RATES     : 1 1.3 1.0  REG DIST              : 097Reg10.D  SCENARIO RECORD      : I/M Scenario CALENDAR YEAR        : 2010 EVALUATION MONTH     : 1 ALTITUDE              : 1 MIN/MAX TEMP         : 49.2 72.6 FUEL RVP              : 9.0 FUEL PROGRAM         : 4  78.4 71.6 52.5 60.4 47.8 39.3 33.0 33.0  30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 348.0 224.0 338.0 380.0 164.0 93.0 87.0 87.0  80.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0 OXYGENATED FUELS    : 0.000 1.000 0.000 0.035 1  END OF RUN </pre> |
| No I/M | <pre> MOBILE6 INPUT FILE : POLLUTANTS          : CO WITH FIELDNAMES     : DAILY OUTPUT        :  RUN DATA  REG DIST              : 097Reg10.D  SCENARIO RECORD      : I/M Scenario CALENDAR YEAR        : 2010 EVALUATION MONTH     : 1 ALTITUDE              : 1 MIN/MAX TEMP         : 49.2 72.6 FUEL RVP              : 9.0 FUEL PROGRAM         : 4  78.4 71.6 52.5 60.4 47.8 39.3 33.0 33.0  30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 348.0 224.0 338.0 380.0 164.0 93.0 87.0 87.0  80.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0 OXYGENATED FUELS    : 0.000 1.000 0.000 0.035 1  END OF RUN </pre>  |



## Winter 2010 (CO)

I/M

```

#####
* I/M Scenario
* File 1, Run 1, Scenario 1.
* #####
M616 Comment:
    User has supplied post-1999 sulfur levels.
*** I/M credits for Tech1&2 vehicles were read from the following external
    data file: TECH12.D
M 48 Warning:
    there are no sales for vehicle class HDGV8b

    Calendar Year: 2010
    Month: Jan.
    Altitude: Low
    Minimum Temperature: 49.2 (F)
    Maximum Temperature: 72.6 (F)
    Absolute Humidity: 75. grains/lb
    Nominal Fuel RVP: 9.0 psi
    Weathered RVP: 9.0 psi
    Fuel Sulfur Content: 30. ppm

    Exhaust I/M Program: Yes
    Evap I/M Program: No
    ATP Program: No
    Reformulated Gas: No

    Ether Blend Market Share: 0.000    Alcohol Blend Market Share: 1.000
    Ether Blend Oxygen Content: 0.000    Alcohol Blend Oxygen Content: 0.035
    Alcohol Blend RVP Waiver: No

    Vehicle Type:    LDGV    LDGT12    LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV    MC    All Veh
    GVWR:            -----
    VMT Distribution: 0.3451  0.3526  0.1481    -----  0.0397  0.0003  0.0022  0.1075  0.0046  1.0000
    -----
Composite Emission Factors (g/mi):
Composite CO :    7.32    11.25    10.02    10.89    6.88    0.899    0.580    1.127    11.66    8.427
    -----
    
```

No I/M

```

#####
* I/M Scenario
* File 1, Run 1, Scenario 1.
* #####
M616 Comment:
    User has supplied post-1999 sulfur levels.
M 48 Warning:
    there are no sales for vehicle class HDGV8b

    Calendar Year: 2010
    Month: Jan.
    Altitude: Low
    Minimum Temperature: 49.2 (F)
    Maximum Temperature: 72.6 (F)
    Absolute Humidity: 75. grains/lb
    Nominal Fuel RVP: 9.0 psi
    Weathered RVP: 9.0 psi
    Fuel Sulfur Content: 30. ppm

    Exhaust I/M Program: No
    Evap I/M Program: No
    ATP Program: No
    Reformulated Gas: No

    Ether Blend Market Share: 0.000    Alcohol Blend Market Share: 1.000
    Ether Blend Oxygen Content: 0.000    Alcohol Blend Oxygen Content: 0.035
    Alcohol Blend RVP Waiver: No

    Vehicle Type:    LDGV    LDGT12    LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV    MC    All Veh
    GVWR:            -----
    VMT Distribution: 0.3451  0.3526  0.1481    -----  0.0397  0.0003  0.0022  0.1075  0.0046  1.0000
    -----
Composite Emission Factors (g/mi):
Composite CO :    8.63    11.25    10.02    10.89    6.88    0.899    0.580    1.127    11.66    8.876
    -----
    
```

## Appendix 4 -- MOBILE6.2 Input Files

| Summer 2002 (HC and NOx) |   |
|--------------------------|---|
| I/M                      | MOBILE6 INPUT FILE :                          |
|                          | POLLUTANTS : HC NOX                           |
|                          | WITH FIELDNAMES :                             |
|                          | DAILY OUTPUT :                                |
|                          | RUN DATA                                      |
|                          | I/M PROGRAM : 1 1977 2050 1 T/O LOADED/IDLE   |
|                          | I/M MODEL YEARS : 1 1967 2050                 |
|                          | I/M VEHICLES : 1 11111 22222222 2             |
|                          | I/M STRINGENCY : 1 28.0                       |
|                          | I/M COMPLIANCE : 1 97.0                       |
|                          | I/M WAIVER RATES : 1 1.3 1.0                  |
|                          | I/M GRACE PERIOD : 1 5                        |
|                          | I/M PROGRAM : 2 1977 2050 2 T/O IM240         |
|                          | I/M MODEL YEARS : 2 1981 1995                 |
|                          | I/M VEHICLES : 2 22222 11111111 1             |
|                          | I/M STRINGENCY : 2 28.0                       |
|                          | I/M COMPLIANCE : 2 97.0                       |
|                          | I/M WAIVER RATES : 2 1.3 1.0                  |
|                          | I/M GRACE PERIOD : 2 5                        |
|                          | I/M CUTPOINTS : 2 CUTPNT02.d                  |
|                          | I/M PROGRAM : 3 1977 2050 1 T/O LOADED/IDLE   |
|                          | I/M MODEL YEARS : 3 1967 1980                 |
|                          | I/M VEHICLES : 3 22222 11111111 1             |
|                          | I/M STRINGENCY : 3 28.0                       |
|                          | I/M COMPLIANCE : 3 97.0                       |
|                          | I/M WAIVER RATES : 3 1.3 1.0                  |
|                          | I/M PROGRAM : 4 2001 2050 2 T/O OBD I/M       |
|                          | I/M MODEL YEARS : 4 1996 2050                 |
|                          | I/M VEHICLES : 4 22222 11111111 1             |
|                          | I/M STRINGENCY : 4 28.0                       |
|                          | I/M COMPLIANCE : 4 97.0                       |
|                          | I/M WAIVER RATES : 4 1.3 1.0                  |
|                          | I/M GRACE PERIOD : 4 5                        |
|                          | I/M PROGRAM : 5 2001 2050 2 T/O EVAP OBD & GC |
|                          | I/M MODEL YEARS : 5 1996 2050                 |
|                          | I/M VEHICLES : 5 22222 11111111 1             |
|                          | I/M STRINGENCY : 5 28.0                       |
|                          | I/M COMPLIANCE : 5 97.0                       |
|                          | I/M WAIVER RATES : 5 1.3 1.0                  |
|                          | I/M GRACE PERIOD : 5 5                        |
|                          | ANTI-TAMP PROG :                              |
|                          | 87 75 80 22222 22222222 2 11 097. 22111222    |
|                          | ANTI-TAMP PROG :                              |
|                          | 87 81 95 11111 22222222 2 11 097. 22111222    |
|                          | REG DIST : 097Reg02.D                         |
|                          | SCENARIO RECORD : I/M Scenario                |
|                          | CALENDAR YEAR : 2002                          |
|                          | EVALUATION MONTH : 7                          |
|                          | ALTITUDE : 1                                  |
|                          | MIN/MAX TEMP : 75.5 102.5                     |
|                          | FUEL RVP : 6.6                                |
|                          | FUEL PROGRAM : 4                              |
|                          | 78.4 71.6 52.5 60.4 47.8 39.3 33.0 33.0       |
|                          | 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0       |
|                          | 348.0 224.0 338.0 380.0 164.0 93.0 87.0 87.0  |
|                          | 80.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0       |
|                          | OXYGENATED FUELS : 1.000 0.000 0.019 0.000 1  |
|                          | END OF RUN                                    |

|   |  |
|---|--|
| <p style="text-align: center;">No I/M</p>                   | <pre> MOBILE6 INPUT FILE : POLLUTANTS       : HC NOX WITH FIELDNAMES  : DAILY OUTPUT     :  RUN DATA  REG DIST          : 097Reg02.D  SCENARIO RECORD  : Non-I/M Scenario CALENDAR YEAR    : 2002 EVALUATION MONTH : 7 ALTITUDE         : 1 MIN/MAX TEMP     : 75.5 102.5 FUEL RVP         : 6.6 FUEL PROGRAM     : 4  78.4  71.6  52.5  60.4  47.8  39.3  33.0  33.0  30.0  30.0  30.0  30.0  30.0  30.0  30.0  30.0 348.0 224.0 338.0 380.0 164.0 93.0 87.0 87.0  80.0  80.0  80.0  80.0  80.0  80.0  80.0  80.0 OXYGENATED FUELS : 1.000 0.000 0.019 0.000 1  END OF RUN </pre>   |
| <p style="text-align: center;">Performance<br/>Standard</p> | <pre> MOBILE6 INPUT FILE : POLLUTANTS       : HC NOX WITH FIELDNAMES  : DAILY OUTPUT     :  RUN DATA  I/M PROGRAM      : 1 1983 2050 1 T/O IDLE I/M MODEL YEARS  : 1 1968 2050 I/M VEHICLES     : 1 22222 11111111 1 I/M STRINGENCY   : 1 20.0 I/M COMPLIANCE   : 1 96.0 I/M WAIVER RATES : 1 3.0 3.0  ANTI-TAMP PROG   : 83 68 71 22222 11111111 1 11 096. 11111121 ANTI-TAMP PROG   : 83 72 50 22222 11111111 1 11 096. 11112111  REG DIST          : 097Reg02.D  SCENARIO RECORD  : EPA's Performance Standard CALENDAR YEAR    : 2002 EVALUATION MONTH : 7 ALTITUDE         : 1 MIN/MAX TEMP     : 75.5 102.5 FUEL RVP         : 6.6 FUEL PROGRAM     : 4  78.4  71.6  52.5  60.4  47.8  39.3  33.0  33.0  30.0  30.0  30.0  30.0  30.0  30.0  30.0  30.0 348.0 224.0 338.0 380.0 164.0 93.0 87.0 87.0  80.0  80.0  80.0  80.0  80.0  80.0  80.0  80.0 OXYGENATED FUELS : 1.000 0.000 0.019 0.000 1  END OF RUN </pre> |

**Winter 2002 (CO)**

I/M

```

MOBILE6 INPUT FILE :
POLLUTANTS          : CO
WITH FIELDNAMES     :
DAILY OUTPUT        :

RUN DATA
I/M PROGRAM          : 1 1977 2050 1 T/O LOADED/IDLE
I/M MODEL YEARS     : 1 1967 2050
I/M VEHICLES        : 1 11111 22222222 2
I/M STRINGENCY      : 1 28.0
I/M COMPLIANCE      : 1 97.0
I/M WAIVER RATES    : 1 1.3 1.0
I/M GRACE PERIOD    : 1 5
I/M PROGRAM          : 2 1977 2050 2 T/O IM240
I/M MODEL YEARS     : 2 1981 1995
I/M VEHICLES        : 2 22222 11111111 1
I/M STRINGENCY      : 2 28.0
I/M COMPLIANCE      : 2 97.0
I/M WAIVER RATES    : 2 1.3 1.0
I/M GRACE PERIOD    : 2 5
I/M CUTPOINTS       : 2 CUTPNT02.d
I/M PROGRAM          : 3 1977 2050 1 T/O LOADED/IDLE
I/M MODEL YEARS     : 3 1967 1980
I/M VEHICLES        : 3 22222 11111111 1
I/M STRINGENCY      : 3 28.0
I/M COMPLIANCE      : 3 97.0
I/M WAIVER RATES    : 3 1.3 1.0
I/M PROGRAM          : 4 2001 2050 2 T/O OBD I/M
I/M MODEL YEARS     : 4 1996 2050
I/M VEHICLES        : 4 22222 11111111 1
I/M STRINGENCY      : 4 28.0
I/M COMPLIANCE      : 4 97.0
I/M WAIVER RATES    : 4 1.3 1.0
I/M GRACE PERIOD    : 4 5
I/M PROGRAM          : 5 2001 2050 2 T/O EVAP OBD & GC
I/M MODEL YEARS     : 5 1996 2050
I/M VEHICLES        : 5 22222 11111111 1
I/M STRINGENCY      : 5 28.0
I/M COMPLIANCE      : 5 97.0
I/M WAIVER RATES    : 5 1.3 1.0
I/M GRACE PERIOD    : 5 5

ANTI-TAMP PROG      :
87 75 80 22222 22222222 2 11 097. 22111222
ANTI-TAMP PROG      :
87 81 95 11111 22222222 2 11 097. 22111222

REG DIST            : 097Reg02.D

SCENARIO RECORD     : I/M Scenario
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 1
ALTITUDE            : 1
MIN/MAX TEMP        : 49.2 72.6
FUEL RVP            : 8.7
FUEL PROGRAM        : 4
78.4 71.6 52.5 60.4 47.8 39.3 33.0 33.0
30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0
348.0 224.0 338.0 380.0 164.0 93.0 87.0 87.0
80.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0
OXYGENATED FUELS    : 0.000 1.000 0.000 0.032 1

END OF RUN
    
```

|   |   |
|---|---|
| <p style="text-align: center;">No I/M</p>                   | <pre> MOBILE6 INPUT FILE : POLLUTANTS       : CO WITH FIELDNAMES  : DAILY OUTPUT     :  RUN DATA  REG DIST          : 097Reg02.D  SCENARIO RECORD   : Non-I/M Scenario CALENDAR YEAR     : 2002 EVALUATION MONTH  : 1 ALTITUDE          : 1 MIN/MAX TEMP      : 49.2 72.6 FUEL RVP          : 8.7 FUEL PROGRAM      : 4  78.4 71.6 52.5 60.4 47.8 39.3 33.0 33.0  30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 348.0 224.0 338.0 380.0 164.0 93.0 87.0 87.0  80.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0 OXYGENATED FUELS : 0.000 1.000 0.000 0.032 1  END OF RUN </pre>   |
| <p style="text-align: center;">Performance<br/>Standard</p> | <pre> MOBILE6 INPUT FILE : POLLUTANTS       : CO WITH FIELDNAMES  : DAILY OUTPUT     :  RUN DATA  I/M PROGRAM       : 1 1983 2050 1 T/O IDLE I/M MODEL YEARS   : 1 1968 2050 I/M VEHICLES      : 1 22222 11111111 1 I/M STRINGENCY    : 1 20.0 I/M COMPLIANCE    : 1 96.0 I/M WAIVER RATES  : 1 3.0 3.0  ANTI-TAMP PROG    : 83 68 71 22222 11111111 1 11 096. 11111121 ANTI-TAMP PROG    : 83 72 50 22222 11111111 1 11 096. 11112111  REG DIST          : 097Reg02.D  SCENARIO RECORD   : EPA's Performance Standard CALENDAR YEAR     : 2002 EVALUATION MONTH  : 1 ALTITUDE          : 1 MIN/MAX TEMP      : 49.2 72.6 FUEL RVP          : 8.7 FUEL PROGRAM      : 4  78.4 71.6 52.5 60.4 47.8 39.3 33.0 33.0  30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 348.0 224.0 338.0 380.0 164.0 93.0 87.0 87.0  80.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0 OXYGENATED FUELS : 0.000 1.000 0.000 0.032 1  END OF RUN </pre> |

**Summer 2008 (HC and NOx)**

I/M

```
MOBILE6 INPUT FILE :
POLLUTANTS          : HC NOX
WITH FIELDNAMES     :
DAILY OUTPUT        :

RUN DATA
I/M PROGRAM         : 1 1977 2050 1 T/O LOADED/IDLE
I/M MODEL YEARS     : 1 1967 2050
I/M VEHICLES        : 1 11111 22222222 2
I/M STRINGENCY      : 1 28.0
I/M COMPLIANCE      : 1 97.0
I/M WAIVER RATES    : 1 1.3 1.0
I/M GRACE PERIOD    : 1 5
I/M PROGRAM         : 2 1977 2050 2 T/O IM240
I/M MODEL YEARS     : 2 1981 1995
I/M VEHICLES        : 2 22222 11111111 1
I/M STRINGENCY      : 2 28.0
I/M COMPLIANCE      : 2 97.0
I/M WAIVER RATES    : 2 1.3 1.0
I/M GRACE PERIOD    : 2 5
I/M CUTPOINTS       : 2 CUTPNT08.d
I/M PROGRAM         : 3 1977 2050 1 T/O LOADED/IDLE
I/M MODEL YEARS     : 3 1967 1980
I/M VEHICLES        : 3 22222 11111111 1
I/M STRINGENCY      : 3 28.0
I/M COMPLIANCE      : 3 97.0
I/M WAIVER RATES    : 3 1.3 1.0
I/M PROGRAM         : 4 2001 2050 2 T/O OBD I/M
I/M MODEL YEARS     : 4 1996 2050
I/M VEHICLES        : 4 22222 11111111 1
I/M STRINGENCY      : 4 28.0
I/M COMPLIANCE      : 4 97.0
I/M WAIVER RATES    : 4 1.3 1.0
I/M GRACE PERIOD    : 4 5
I/M PROGRAM         : 5 2001 2050 2 T/O EVAP OBD & GC
I/M MODEL YEARS     : 5 1996 2050
I/M VEHICLES        : 5 22222 11111111 1
I/M STRINGENCY      : 5 28.0
I/M COMPLIANCE      : 5 97.0
I/M WAIVER RATES    : 5 1.3 1.0
I/M GRACE PERIOD    : 5 5

ANTI-TAMP PROG      :
87 75 80 22222 22222222 2 11 097. 22111222
ANTI-TAMP PROG      :
87 81 95 11111 22222222 2 11 097. 22111222

REG DIST            : 097Reg08.D

SCENARIO RECORD     : I/M Scenario
CALENDAR YEAR       : 2008
EVALUATION MONTH    : 7
ALTITUDE            : 1
MIN/MAX TEMP        : 75.5 102.5
FUEL RVP            : 7.0
FUEL PROGRAM        : 2 S

END OF RUN
```

|   |   |
|---|---|
| <p style="text-align: center;">No I/M</p>                   | <pre> MOBILE6 INPUT FILE : POLLUTANTS       : HC NOX WITH FIELDNAMES  : DAILY OUTPUT     :  RUN DATA  REG DIST          : 097Reg08.D  SCENARIO RECORD  : Non-I/M Scenario CALENDAR YEAR    : 2008 EVALUATION MONTH : 7 ALTITUDE         : 1 MIN/MAX TEMP     : 75.5 102.5 FUEL RVP         : 7.0 FUEL PROGRAM     : 2 S  END OF RUN </pre>  |
| <p style="text-align: center;">Performance<br/>Standard</p> | <pre> MOBILE6 INPUT FILE : POLLUTANTS       : HC NOX WITH FIELDNAMES  : DAILY OUTPUT     :  RUN DATA I/M PROGRAM      : 1 1983 2050 1 T/O IDLE I/M MODEL YEARS  : 1 1968 2050 I/M VEHICLES     : 1 22222 11111111 1 I/M STRINGENCY   : 1 20.0 I/M COMPLIANCE   : 1 96.0 I/M WAIVER RATES : 1 3.0 3.0  ANTI-TAMP PROG   : 83 68 71 22222 11111111 1 11 096. 11111121 ANTI-TAMP PROG   : 83 72 50 22222 11111111 1 11 096. 11112111  REG DIST          : 097Reg08.D  SCENARIO RECORD  : EPA's Performance Standard CALENDAR YEAR    : 2008 EVALUATION MONTH : 7 ALTITUDE         : 1 MIN/MAX TEMP     : 75.5 102.5 FUEL RVP         : 7.0 FUEL PROGRAM     : 2 S  END OF RUN </pre> |

**Winter 2008 (CO)**

I/M

```

MOBILE6 INPUT FILE :
POLLUTANTS          : CO
WITH FIELDNAMES     :
DAILY OUTPUT        :

RUN DATA
I/M PROGRAM         : 1 1977 2050 1 T/O LOADED/IDLE
I/M MODEL YEARS     : 1 1967 2050
I/M VEHICLES        : 1 11111 22222222 2
I/M STRINGENCY      : 1 28.0
I/M COMPLIANCE      : 1 97.0
I/M WAIVER RATES    : 1 1.3 1.0
I/M GRACE PERIOD    : 1 5
I/M PROGRAM         : 2 1977 2050 2 T/O IM240
I/M MODEL YEARS     : 2 1981 1995
I/M VEHICLES        : 2 22222 11111111 1
I/M STRINGENCY      : 2 28.0
I/M COMPLIANCE      : 2 97.0
I/M WAIVER RATES    : 2 1.3 1.0
I/M GRACE PERIOD    : 2 5
I/M CUTPOINTS       : 2 CUTPNT08.d
I/M PROGRAM         : 3 1977 2050 1 T/O LOADED/IDLE
I/M MODEL YEARS     : 3 1967 1980
I/M VEHICLES        : 3 22222 11111111 1
I/M STRINGENCY      : 3 28.0
I/M COMPLIANCE      : 3 97.0
I/M WAIVER RATES    : 3 1.3 1.0
I/M PROGRAM         : 4 2001 2050 2 T/O OBD I/M
I/M MODEL YEARS     : 4 1996 2050
I/M VEHICLES        : 4 22222 11111111 1
I/M STRINGENCY      : 4 28.0
I/M COMPLIANCE      : 4 97.0
I/M WAIVER RATES    : 4 1.3 1.0
I/M GRACE PERIOD    : 4 5
I/M PROGRAM         : 5 2001 2050 2 T/O EVAP OBD & GC
I/M MODEL YEARS     : 5 1996 2050
I/M VEHICLES        : 5 22222 11111111 1
I/M STRINGENCY      : 5 28.0
I/M COMPLIANCE      : 5 97.0
I/M WAIVER RATES    : 5 1.3 1.0
I/M GRACE PERIOD    : 5 5

ANTI-TAMP PROG      :
87 75 80 22222 22222222 2 11 097. 22111222
ANTI-TAMP PROG      :
87 81 95 11111 22222222 2 11 097. 22111222

REG DIST            : 097Reg08.D

SCENARIO RECORD     : I/M Scenario
CALENDAR YEAR       : 2008
EVALUATION MONTH    : 1
ALTITUDE            : 1
MIN/MAX TEMP        : 49.2 72.6
FUEL RVP            : 9.0
FUEL PROGRAM        : 4
78.4 71.6 52.5 60.4 47.8 39.3 33.0 33.0
30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0
348.0 224.0 338.0 380.0 164.0 93.0 87.0 87.0
80.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0
OXYGENATED FUELS    : 0.000 1.000 0.000 0.035 1

END OF RUN
    
```

|                             |  |
|-----------------------------|--|
| <p>No I/M</p>               | <pre> MOBILE6 INPUT FILE : POLLUTANTS       : CO WITH FIELDNAMES  : DAILY OUTPUT     :  RUN DATA  REG DIST          : 097Reg08.D  SCENARIO RECORD   : Non-I/M Scenario CALENDAR YEAR     : 2008 EVALUATION MONTH  : 1 ALTITUDE          : 1 MIN/MAX TEMP      : 49.2 72.6 FUEL RVP          : 9.0 FUEL PROGRAM      : 4  78.4  71.6  52.5  60.4  47.8  39.3  33.0  33.0  30.0  30.0  30.0  30.0  30.0  30.0  30.0  30.0 348.0 224.0 338.0 380.0 164.0 93.0 87.0 87.0  80.0  80.0  80.0  80.0  80.0  80.0  80.0  80.0 OXYGENATED FUELS : 0.000 1.000 0.000 0.035 1  END OF RUN </pre>   |
| <p>Performance Standard</p> | <pre> MOBILE6 INPUT FILE : POLLUTANTS       : CO WITH FIELDNAMES  : DAILY OUTPUT     :  RUN DATA  I/M PROGRAM       : 1 1983 2050 1 T/O IDLE I/M MODEL YEARS   : 1 1968 2050 I/M VEHICLES      : 1 22222 11111111 1 I/M STRINGENCY    : 1 20.0 I/M COMPLIANCE    : 1 96.0 I/M WAIVER RATES  : 1 3.0 3.0  ANTI-TAMP PROG    : 83 68 71 22222 11111111 1 11 096. 11111121 ANTI-TAMP PROG    : 83 72 50 22222 11111111 1 11 096. 11112111  REG DIST          : 097Reg08.D  SCENARIO RECORD   : EPA's Performance Standard CALENDAR YEAR     : 2008 EVALUATION MONTH  : 1 ALTITUDE          : 1 MIN/MAX TEMP      : 49.2 72.6 FUEL RVP          : 9.0 FUEL PROGRAM      : 4  78.4  71.6  52.5  60.4  47.8  39.3  33.0  33.0  30.0  30.0  30.0  30.0  30.0  30.0  30.0  30.0 348.0 224.0 338.0 380.0 164.0 93.0 87.0 87.0  80.0  80.0  80.0  80.0  80.0  80.0  80.0  80.0 OXYGENATED FUELS : 0.000 1.000 0.000 0.035 1  END OF RUN </pre> |

# Appendix 5 -- MOBILE6.2 Output Files

| Summer 2002 (HC and NOx) |   |
|--------------------------|---|
| I/M                      | <pre> ##### * I/M Scenario * File 1, Run 1, Scenario 1. * ##### M616 Comment:       User has supplied post-1999 sulfur levels. *** I/M credits for Tech1&amp;2 vehicles were read from the following external data file: TECH12.D M 48 Warning:       there are no sales for vehicle class HDGV8b        Calendar Year: 2002       Month: July       Altitude: Low       Minimum Temperature: 75.5 (F)       Maximum Temperature: 102.5 (F)       Absolute Humidity: 75. grains/lb       Nominal Fuel RVP: 6.6 psi       Weathered RVP: 6.0 psi       Fuel Sulfur Content: 53. ppm        Exhaust I/M Program: Yes       Evap I/M Program: Yes       ATP Program: Yes       Reformulated Gas: No        Ether Blend Market Share: 1.000      Alcohol Blend Market Share: 0.000       Ether Blend Oxygen Content: 0.019    Alcohol Blend Oxygen Content: 0.000   Alcohol Blend RVP Waiver: No        Vehicle Type:      LDGV      LDGT12      LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV      MC      All Veh       GVWR:              &lt;6000     &gt;6000      (All)       VMT Distribution:  0.4461    0.2797     0.1200      0.0394    0.0008    0.0020    0.1070    0.0050    1.0000        Composite Emission Factors (g/mi):       Composite VOC :    1.280    1.686    1.537    1.641    1.220    0.797    0.894    0.531    3.32    1.351       Composite NOX :    0.999    1.289    1.312    1.296    4.320    1.674    1.590    14.253    1.13    2.669           </pre> |
| No I/M                   | <pre> ##### * Non-I/M Scenario * File 1, Run 1, Scenario 1. * ##### M616 Comment:       User has supplied post-1999 sulfur levels. M 48 Warning:       there are no sales for vehicle class HDGV8b        Calendar Year: 2002       Month: July       Altitude: Low       Minimum Temperature: 75.5 (F)       Maximum Temperature: 102.5 (F)       Absolute Humidity: 75. grains/lb       Nominal Fuel RVP: 6.6 psi       Weathered RVP: 6.0 psi       Fuel Sulfur Content: 53. ppm        Exhaust I/M Program: No       Evap I/M Program: No       ATP Program: No       Reformulated Gas: No        Ether Blend Market Share: 1.000      Alcohol Blend Market Share: 0.000       Ether Blend Oxygen Content: 0.019    Alcohol Blend Oxygen Content: 0.000   Alcohol Blend RVP Waiver: No        Vehicle Type:      LDGV      LDGT12      LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV      MC      All Veh       GVWR:              &lt;6000     &gt;6000      (All)       VMT Distribution:  0.4461    0.2797     0.1200      0.0394    0.0008    0.0020    0.1070    0.0050    1.0000        Composite Emission Factors (g/mi):       Composite VOC :    1.494    1.986    1.696    1.899    1.268    0.797    0.894    0.531    3.32    1.552       Composite NOX :    1.123    1.438    1.397    1.426    4.360    1.674    1.590    14.253    1.13    2.778           </pre>   |

Performance  
Standard

```

#####
* EPA's Performance Standard
* File 1, Run 1, Scenario 1.
#####
M16 Comment:
      User has supplied post-1999 sulfur levels.
*** I/M credits for Tech1&2 vehicles were read from the following external
data file: TECH12.D
M 48 Warning:
      there are no sales for vehicle class HDGV8b

      Calendar Year: 2002
      Month: July
      Altitude: Low
      Minimum Temperature: 75.5 (F)
      Maximum Temperature: 102.5 (F)
      Absolute Humidity: 75. grains/lb
      Nominal Fuel RVP: 6.6 psi
      Weathered RVP: 6.0 psi
      Fuel Sulfur Content: 53. ppm

      Exhaust I/M Program: Yes
      Evap I/M Program: No
      ATP Program: Yes
      Reformulated Gas: No

      Ether Blend Market Share: 1.000      Alcohol Blend Market Share: 0.000
      Ether Blend Oxygen Content: 0.019    Alcohol Blend Oxygen Content: 0.000
      Alcohol Blend RVP Waiver: No

      Vehicle Type:      LDGV      LDGT12      LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV      MC      All Veh
      GVWR:              <6000    >6000      (All)
      VMT Distribution:  0.4461    0.2797    0.1200      -----    0.0394    0.0008    0.0020    0.1070    0.0050    1.0000
      -----
      Composite Emission Factors (g/mi):
      Composite VOC :    1.322    1.767    1.578    1.711    1.268    0.797    0.894    0.531    3.32    1.400
      Composite NOX :    1.099    1.395    1.369    1.387    4.360    1.674    1.590    14.253    1.13    2.752
      -----

```

**Winter 2002 (CO)**

I/M

```

* #####
* I/M Scenario
* File 1, Run 1, Scenario 1.
* #####
* M616 Comment:
  User has supplied post-1999 sulfur levels.
*** I/M credits for Tech1&2 vehicles were read from the following external
data file: TECH12.D
M 48 Warning:
  there are no sales for vehicle class HDGV8b

  Calendar Year: 2002
  Month: Jan.
  Altitude: Low
  Minimum Temperature: 49.2 (F)
  Maximum Temperature: 72.6 (F)
  Absolute Humidity: 75. grains/lb
  Nominal Fuel RVP: 8.7 psi
  Weathered RVP: 8.7 psi
  Fuel Sulfur Content: 53. ppm

  Exhaust I/M Program: Yes
  Evap I/M Program: Yes
  ATP Program: Yes
  Reformulated Gas: No

Ether Blend Market Share: 0.000 Alcohol Blend Market Share: 1.000
Ether Blend Oxygen Content: 0.000 Alcohol Blend Oxygen Content: 0.032
Alcohol Blend RVP Waiver: No

  Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
  GVWR: <6000 >6000 (All)
  VMT Distribution: 0.4516 0.2787 0.1172 0.0389 0.0008 0.0020 0.1058 0.0051 1.0000

Composite Emission Factors (g/mi):
Composite CO : 10.83 15.72 14.37 15.32 7.91 1.792 1.564 2.659 12.26 11.611
  
```

No I/M

```

* #####
* Non-I/M Scenario
* File 1, Run 1, Scenario 1.
* #####
* M616 Comment:
  User has supplied post-1999 sulfur levels.
M 48 Warning:
  there are no sales for vehicle class HDGV8b

  Calendar Year: 2002
  Month: Jan.
  Altitude: Low
  Minimum Temperature: 49.2 (F)
  Maximum Temperature: 72.6 (F)
  Absolute Humidity: 75. grains/lb
  Nominal Fuel RVP: 8.7 psi
  Weathered RVP: 8.7 psi
  Fuel Sulfur Content: 53. ppm

  Exhaust I/M Program: No
  Evap I/M Program: No
  ATP Program: No
  Reformulated Gas: No

Ether Blend Market Share: 0.000 Alcohol Blend Market Share: 1.000
Ether Blend Oxygen Content: 0.000 Alcohol Blend Oxygen Content: 0.032
Alcohol Blend RVP Waiver: No

  Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
  GVWR: <6000 >6000 (All)
  VMT Distribution: 0.4516 0.2787 0.1172 0.0389 0.0008 0.0020 0.1058 0.0051 1.0000

Composite Emission Factors (g/mi):
Composite CO : 13.91 19.64 17.99 19.15 8.73 1.792 1.564 2.659 12.26 14.549
  
```

Performance  
Standard

```

#####
* EPA's Performance Standard
* File 1, Run 1, Scenario 1.
* #####
M616 Comment:
    User has supplied post-1999 sulfur levels.
*** I/M credits for Tech1&2 vehicles were read from the following external
data file: TECH12.D
M 48 Warning:
    there are no sales for vehicle class HDGV8b

    Calendar Year: 2002
    Month: Jan.
    Altitude: Low
    Minimum Temperature: 49.2 (F)
    Maximum Temperature: 72.6 (F)
    Absolute Humidity: 75. grains/lb
    Nominal Fuel RVP: 8.7 psi
    Weathered RVP: 8.7 psi
    Fuel Sulfur Content: 53. ppm

    Exhaust I/M Program: Yes
    Evap I/M Program: No
    ATP Program: Yes
    Reformulated Gas: No

    Ether Blend Market Share: 0.000    Alcohol Blend Market Share: 1.000
    Ether Blend Oxygen Content: 0.000    Alcohol Blend Oxygen Content: 0.032
                                           Alcohol Blend RVP Waiver: No

    Vehicle Type:    LDGV    LDGT12    LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV    MC    All Veh
    GVWR:            <6000    >6000    (All)
    -----
VMT Distribution:  0.4516  0.2787  0.1172    -----    0.0389  0.0008  0.0020  0.1058  0.0051  1.0000
    -----
Composite Emission Factors (g/mi):
Composite CO :    11.48  16.76  14.90  16.21  8.73  1.792  1.564  2.659  12.26  12.287
    -----

```

## Summer 2008 (HC and NOx)

I/M

```

#####
* I/M Scenario
* File 1, Run 1, Scenario 1.
* #####
M616 Comment:
    User has supplied post-1999 sulfur levels.
*** I/M credits for Tech1&2 vehicles were read from the following external
    data file: TECH12.D
M 48 Warning:
    there are no sales for vehicle class HDGV8b

    Calendar Year: 2008
    Month: July
    Altitude: Low
    Minimum Temperature: 75.5 (F)
    Maximum Temperature: 102.5 (F)
    Absolute Humidity: 75. grains/lb
    Fuel Sulfur Content: 30. ppm

    Exhaust I/M Program: Yes
    Evap I/M Program: Yes
    ATP Program: Yes
    Reformulated Gas: Yes

    Vehicle Type:   LDGV   LDGT12  LDGT34   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
    GVWR:          <6000 >6000   (All)
    VMT Distribution: 0.3647 0.3358 0.1439          0.0400 0.0004 0.0022 0.1084 0.0046 1.0000

Composite Emission Factors (g/ml):
Composite VOC :    0.754 0.989 0.872 0.953 0.750 0.369 0.418 0.361 3.23 0.818
Composite NOX  :    0.581 0.881 0.885 0.882 2.190 0.822 0.739 6.872 1.14 1.474
    
```

No I/M

```

#####
* Non-I/M Scenario
* File 1, Run 1, Scenario 1.
* #####
M616 Comment:
    User has supplied post-1999 sulfur levels.
M 48 Warning:
    there are no sales for vehicle class HDGV8b

    Calendar Year: 2008
    Month: July
    Altitude: Low
    Minimum Temperature: 75.5 (F)
    Maximum Temperature: 102.5 (F)
    Absolute Humidity: 75. grains/lb
    Fuel Sulfur Content: 30. ppm

    Exhaust I/M Program: No
    Evap I/M Program: No
    ATP Program: No
    Reformulated Gas: Yes

    Vehicle Type:   LDGV   LDGT12  LDGT34   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
    GVWR:          <6000 >6000   (All)
    VMT Distribution: 0.3647 0.3358 0.1439          0.0400 0.0004 0.0022 0.1084 0.0046 1.0000

Composite Emission Factors (g/ml):
Composite VOC :    0.847 1.112 0.953 1.064 0.774 0.369 0.418 0.361 3.23 0.906
Composite NOX  :    0.688 1.022 0.977 1.008 2.202 0.822 0.739 6.872 1.14 1.575
    
```

Performance  
Standard

```

#####
* EPA's Performance Standard
* File 1, Run 1, Scenario 1.
#####
M16 Comment:
    User has supplied post-1999 sulfur levels.
*** I/M credits for Tech1&2 vehicles were read from the following external
data file: TECH12.D
M 48 Warning:
    there are no sales for vehicle class HDGV8b

        Calendar Year: 2008
            Month: July
            Altitude: Low
    Minimum Temperature: 75.5 (F)
    Maximum Temperature: 102.5 (F)
    Absolute Humidity: 75. grains/lb
    Fuel Sulfur Content: 30. ppm

    Exhaust I/M Program: Yes
    Evap I/M Program: No
    ATP Program: Yes
    Reformulated Gas: Yes

    Vehicle Type:      LDGV   LDGT12  LDGT34  LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
    GVWR:             <6000 >6000   (All)
    -----
    VMT Distribution: 0.3647 0.3358 0.1439          0.0400 0.0004 0.0022 0.1084 0.0046 1.0000
    -----
Composite Emission Factors (g/ml):
    Composite VOC :    0.789    1.033    0.894    0.992    0.774    0.369    0.418    0.361    3.23    0.850
    Composite NOX :    0.682    1.014    0.971    1.001    2.202    0.822    0.739    6.872    1.14    1.569
    -----

```

**Winter 2008 (CO)**

I/M

```

* #####
* I/M Scenario
* File 1, Run 1, Scenario 1.
* #####
* M616 Comment:
  User has supplied post-1999 sulfur levels.
*** I/M credits for Tech1&2 vehicles were read from the following external
data file: TECH12.D
M 48 Warning:
  there are no sales for vehicle class HDGV8b

  Calendar Year: 2008
  Month: Jan.
  Altitude: Low
  Minimum Temperature: 49.2 (F)
  Maximum Temperature: 72.6 (F)
  Absolute Humidity: 75 grains/lb
  Nominal Fuel RVP: 9.0 psi
  Weathered RVP: 9.0 psi
  Fuel Sulfur Content: 30. ppm

  Exhaust I/M Program: Yes
  Evap I/M Program: Yes
  ATP Program: Yes
  Reformulated Gas: No

Ether Blend Market Share: 0.000 Alcohol Blend Market Share: 1.000
Ether Blend Oxygen Content: 0.000 Alcohol Blend Oxygen Content: 0.035
Alcohol Blend RVP Waiver: No

  Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
  GVWR: <6000 >6000 (All)
  VMT Distribution: 0.3705 0.3348 0.1406 0.0395 0.0004 0.0021 0.1073 0.0046 1.0000

Composite Emission Factors (g/mi):
Composite CO : 7.65 10.74 9.62 10.41 6.76 1.210 0.737 1.956 11.66 8.316
  
```

No I/M

```

* #####
* Non-I/M Scenario
* File 1, Run 1, Scenario 1.
* #####
* M616 Comment:
  User has supplied post-1999 sulfur levels.
M 48 Warning:
  there are no sales for vehicle class HDGV8b

  Calendar Year: 2008
  Month: Jan.
  Altitude: Low
  Minimum Temperature: 49.2 (F)
  Maximum Temperature: 72.6 (F)
  Absolute Humidity: 75 grains/lb
  Nominal Fuel RVP: 9.0 psi
  Weathered RVP: 9.0 psi
  Fuel Sulfur Content: 30. ppm

  Exhaust I/M Program: No
  Evap I/M Program: No
  ATP Program: No
  Reformulated Gas: No

Ether Blend Market Share: 0.000 Alcohol Blend Market Share: 1.000
Ether Blend Oxygen Content: 0.000 Alcohol Blend Oxygen Content: 0.035
Alcohol Blend RVP Waiver: No

  Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
  GVWR: <6000 >6000 (All)
  VMT Distribution: 0.3705 0.3348 0.1406 0.0395 0.0004 0.0021 0.1073 0.0046 1.0000

Composite Emission Factors (g/mi):
Composite CO : 9.47 12.74 11.14 12.27 7.23 1.210 0.737 1.956 11.66 9.895
  
```

Performance  
Standard

```

#####
* EPA's Performance Standard
* File 1, Run 1, Scenario 1.
* #####
M616 Comment:
    User has supplied post-1999 sulfur levels.
*** I/M credits for Tech1&2 vehicles were read from the following external
data file: TECH12.D
M 48 Warning:
    there are no sales for vehicle class HDGV8b

    Calendar Year: 2008
    Month: Jan.
    Altitude: Low
    Minimum Temperature: 49.2 (F)
    Maximum Temperature: 72.6 (F)
    Absolute Humidity: 75. grains/lb
    Nominal Fuel RVP: 9.0 psi
    Weathered RVP: 9.0 psi
    Fuel Sulfur Content: 30. ppm

    Exhaust I/M Program: Yes
    Evap I/M Program: No
    ATP Program: Yes
    Reformulated Gas: No

    Ether Blend Market Share: 0.000    Alcohol Blend Market Share: 1.000
    Ether Blend Oxygen Content: 0.000    Alcohol Blend Oxygen Content: 0.035
                                           Alcohol Blend RVP Waiver: No

    Vehicle Type:    LDGV    LDGT12    LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV    MC    All Veh
    GVWR:            <6000    >6000    (All)
    VMT Distribution: 0.3705    0.3348    0.1406    -----    0.0395    0.0004    0.0021    0.1073    0.0046    1.0000
    -----
    Composite Emission Factors (g/mi):
    Composite CO :    8.11    11.32    9.88    10.89    7.23    1.210    0.737    1.956    11.66    8.735
    -----

```

## Appendix 6 -- IM147 Cutpoints

### IM147 Cutpoints for 2002 (CUTPNT02.D)

\* External data file (IM147 CUTPOINTS, COMPOSITE for 2002)

\*

I/M CUTPOINTS

\* Block 1 (LDGV, LDGT1)

|        |        |        |        |        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.800  | 0.800  | 0.800  | 0.800  | 0.800  | 0.800  | 0.800  | 0.800  | 0.800  | 0.800  | 1.000  |
| 1.000  | 1.000  | 1.000  | 1.600  | 1.600  | 1.600  | 1.600  | 2.400  | 2.400  | 2.400  | 2.400  |
| 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  |        |        |        |        |        |
| 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 |
| 12.000 | 12.000 | 12.000 | 15.000 | 15.000 | 15.000 | 15.000 | 20.000 | 20.000 | 20.000 | 20.000 |
| 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 |        |        |        |        |        |
| 2.000  | 2.000  | 2.000  | 2.000  | 2.000  | 2.000  | 2.000  | 2.000  | 2.000  | 2.000  | 2.500  |
| 2.500  | 2.500  | 2.500  | 2.500  | 2.500  | 2.500  | 2.500  | 2.500  | 3.500  | 3.500  | 3.500  |
| 3.500  | 3.500  | 3.500  | 3.500  | 3.500  | 3.500  |        |        |        |        |        |

\* Block 2 (LDGT2, LDGT3)

|        |        |        |        |        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1.600  | 1.600  | 1.600  | 1.600  | 1.600  | 1.600  | 1.600  | 1.600  | 1.600  | 1.600  | 2.000  |
| 2.000  | 2.000  | 2.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 4.000  | 4.000  | 4.000  |
| 4.000  | 4.000  | 4.000  | 4.000  | 4.000  | 4.000  |        |        |        |        |        |
| 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 |
| 20.000 | 20.000 | 20.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 40.000 | 40.000 | 40.000 |
| 40.000 | 40.000 | 40.000 | 40.000 | 40.000 | 40.000 |        |        |        |        |        |
| 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 4.000  |
| 4.000  | 4.000  | 4.000  | 4.500  | 4.500  | 4.500  | 4.500  | 5.500  | 5.500  | 5.500  | 5.500  |
| 5.500  | 5.500  | 5.500  | 5.500  | 5.500  | 5.500  |        |        |        |        |        |

\* Block 3 (LDGT4)

|        |        |        |        |        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 2.400  | 2.400  | 2.400  | 2.400  | 2.400  | 2.400  | 2.400  | 2.400  | 2.400  | 2.400  | 3.000  |
| 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 4.000  | 4.000  | 4.400  | 4.400  | 4.400  | 4.400  |
| 4.400  | 4.400  | 4.400  | 4.400  | 4.400  | 4.400  |        |        |        |        |        |
| 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 |
| 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 40.000 | 40.000 | 48.000 | 48.000 | 48.000 | 48.000 |
| 48.000 | 48.000 | 48.000 | 48.000 | 48.000 | 48.000 |        |        |        |        |        |
| 4.000  | 4.000  | 4.000  | 4.000  | 4.000  | 4.000  | 4.000  | 4.000  | 4.000  | 4.000  | 5.000  |
| 5.000  | 5.000  | 5.000  | 5.500  | 5.500  | 5.500  | 5.500  | 5.500  | 7.000  | 7.000  | 7.000  |
| 7.000  | 7.000  | 7.000  | 7.000  | 7.000  | 7.000  |        |        |        |        |        |

\* Block 4 (HDGV)

|        |        |        |        |        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  |
| 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  |
| 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  |        |        |        |        |        |
| 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 |
| 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 |
| 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 |        |        |        |        |        |
| 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  |
| 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  |
| 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  |        |        |        |        |        |

### IM147 Cutpoints for 2008 (CUTPNT08.D)

\* External data file (IM147 CUTPOINTS, COMPOSITE for 2008)

\*

I/M CUTPOINTS

\* Block 1 (LDGV, LDGT1)

|        |        |        |        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.800  | 0.800  | 0.800  | 0.800  | 0.800  | 0.800  | 0.800  | 0.800  | 0.800  | 0.800  |
| 0.800  | 0.800  | 0.800  | 0.800  | 0.800  | 1.000  | 1.000  | 1.000  | 1.000  | 1.600  |
| 1.600  | 1.600  | 1.600  | 2.400  | 2.400  |        |        |        |        |        |
| 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 |
| 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 12.000 | 15.000 |
| 15.000 | 15.000 | 15.000 | 20.000 | 20.000 |        |        |        |        |        |
| 2.000  | 2.000  | 2.000  | 2.000  | 2.000  | 2.000  | 2.000  | 2.000  | 2.000  | 2.000  |
| 2.000  | 2.000  | 2.000  | 2.000  | 2.000  | 2.500  | 2.500  | 2.500  | 2.500  | 2.500  |
| 2.500  | 2.500  | 2.500  | 3.500  | 3.500  |        |        |        |        |        |

\* Block 2 (LDGT2, LDGT3)

|        |        |        |        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1.600  | 1.600  | 1.600  | 1.600  | 1.600  | 1.600  | 1.600  | 1.600  | 1.600  | 1.600  |
| 1.600  | 1.600  | 1.600  | 1.600  | 1.600  | 2.000  | 2.000  | 2.000  | 2.000  | 3.000  |
| 3.000  | 3.000  | 3.000  | 4.000  | 4.000  |        |        |        |        |        |
| 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 |
| 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 25.000 |
| 25.000 | 25.000 | 25.000 | 40.000 | 40.000 |        |        |        |        |        |
| 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  |
| 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 4.000  | 4.000  | 4.000  | 4.000  | 4.500  |
| 4.500  | 4.500  | 5.500  | 5.500  | 5.500  |        |        |        |        |        |

\* Block 3 (LDGT4)

|        |        |        |        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 2.400  | 2.400  | 2.400  | 2.400  | 2.400  | 2.400  | 2.400  | 2.400  | 2.400  | 2.400  |
| 2.400  | 2.400  | 2.400  | 2.400  | 2.400  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  |
| 3.000  | 4.000  | 4.000  | 4.400  | 4.400  |        |        |        |        |        |
| 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 |
| 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 | 25.000 |
| 25.000 | 40.000 | 40.000 | 48.000 | 48.000 |        |        |        |        |        |
| 4.000  | 4.000  | 4.000  | 4.000  | 4.000  | 4.000  | 4.000  | 4.000  | 4.000  | 4.000  |
| 4.000  | 4.000  | 4.000  | 4.000  | 4.000  | 5.000  | 5.000  | 5.000  | 5.000  | 5.500  |
| 5.500  | 5.500  | 5.500  | 7.000  | 7.000  |        |        |        |        |        |

\* Block 4 (HDGV)

|        |        |        |        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  |
| 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  | 1.200  |
| 1.200  | 1.200  | 1.200  | 1.200  | 1.200  |        |        |        |        |        |
| 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 |
| 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 |
| 20.000 | 20.000 | 20.000 | 20.000 | 20.000 |        |        |        |        |        |
| 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  |
| 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  | 3.000  |
| 3.000  | 3.000  | 3.000  | 3.000  | 3.000  |        |        |        |        |        |

## Appendix 7 -- Vehicle Registration Data

| 2002 Vehicle Registration (097Reg02.D) |        |        |        |        |        |        |        |        |        |        |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| REG DIST                               |        |        |        |        |        |        |        |        |        |        |
| * LDV                                  |        |        |        |        |        |        |        |        |        |        |
| 1                                      | 0.0723 | 0.0941 | 0.0891 | 0.0823 | 0.0763 | 0.0716 | 0.0683 | 0.0658 | 0.0583 | 0.0483 |
|  | 0.0443 | 0.0340 | 0.0346 | 0.0273 | 0.0224 | 0.0176 | 0.0155 | 0.0130 | 0.0110 | 0.0083 |
|  | 0.0070 | 0.0054 | 0.0045 | 0.0031 | 0.0256 |        |        |        |        |        |
| * LDT1                                 |        |        |        |        |        |        |        |        |        |        |
| 2                                      | 0.0496 | 0.0856 | 0.0728 | 0.0828 | 0.0715 | 0.0663 | 0.0758 | 0.0642 | 0.0540 | 0.0499 |
|  | 0.0535 | 0.0369 | 0.0372 | 0.0339 | 0.0220 | 0.0155 | 0.0138 | 0.0129 | 0.0151 | 0.0099 |
|  | 0.0076 | 0.0102 | 0.0072 | 0.0051 | 0.0466 |        |        |        |        |        |
| * LDT2                                 |        |        |        |        |        |        |        |        |        |        |
| 3                                      | 0.0496 | 0.0856 | 0.0728 | 0.0828 | 0.0715 | 0.0663 | 0.0758 | 0.0642 | 0.0540 | 0.0499 |
|  | 0.0535 | 0.0369 | 0.0372 | 0.0339 | 0.0220 | 0.0155 | 0.0138 | 0.0129 | 0.0151 | 0.0099 |
|  | 0.0076 | 0.0102 | 0.0072 | 0.0051 | 0.0466 |        |        |        |        |        |
| * LDT3                                 |        |        |        |        |        |        |        |        |        |        |
| 4                                      | 0.1403 | 0.1310 | 0.0869 | 0.0749 | 0.0630 | 0.0457 | 0.0574 | 0.0574 | 0.0467 | 0.0373 |
|  | 0.0346 | 0.0293 | 0.0305 | 0.0249 | 0.0183 | 0.0127 | 0.0104 | 0.0102 | 0.0131 | 0.0116 |
|  | 0.0044 | 0.0064 | 0.0054 | 0.0035 | 0.0441 |        |        |        |        |        |
| * LDT4                                 |        |        |        |        |        |        |        |        |        |        |
| 5                                      | 0.1403 | 0.1310 | 0.0869 | 0.0749 | 0.0630 | 0.0457 | 0.0574 | 0.0574 | 0.0467 | 0.0373 |
|  | 0.0346 | 0.0293 | 0.0305 | 0.0249 | 0.0183 | 0.0127 | 0.0104 | 0.0102 | 0.0131 | 0.0116 |
|  | 0.0044 | 0.0064 | 0.0054 | 0.0035 | 0.0441 |        |        |        |        |        |
| * HDV2B                                |        |        |        |        |        |        |        |        |        |        |
| 6                                      | 0.1396 | 0.1768 | 0.1069 | 0.0597 | 0.0367 | 0.0193 | 0.0239 | 0.0634 | 0.0443 | 0.0368 |
|  | 0.0518 | 0.0361 | 0.0383 | 0.0622 | 0.0366 | 0.0043 | 0.0040 | 0.0159 | 0.0160 | 0.0111 |
|  | 0.0022 | 0.0026 | 0.0016 | 0.0010 | 0.0089 |        |        |        |        |        |
| * HDV3                                 |        |        |        |        |        |        |        |        |        |        |
| 7                                      | 0.1396 | 0.1768 | 0.1069 | 0.0597 | 0.0367 | 0.0193 | 0.0239 | 0.0634 | 0.0443 | 0.0368 |
|  | 0.0518 | 0.0361 | 0.0383 | 0.0622 | 0.0366 | 0.0043 | 0.0040 | 0.0159 | 0.0160 | 0.0111 |
|  | 0.0022 | 0.0026 | 0.0016 | 0.0010 | 0.0089 |        |        |        |        |        |
| * HDV4                                 |        |        |        |        |        |        |        |        |        |        |
| 8                                      | 0.1396 | 0.1768 | 0.1069 | 0.0597 | 0.0367 | 0.0193 | 0.0239 | 0.0634 | 0.0443 | 0.0368 |
|  | 0.0518 | 0.0361 | 0.0383 | 0.0622 | 0.0366 | 0.0043 | 0.0040 | 0.0159 | 0.0160 | 0.0111 |
|  | 0.0022 | 0.0026 | 0.0016 | 0.0010 | 0.0089 |        |        |        |        |        |
| * HDV5                                 |        |        |        |        |        |        |        |        |        |        |
| 9                                      | 0.1396 | 0.1768 | 0.1069 | 0.0597 | 0.0367 | 0.0193 | 0.0239 | 0.0634 | 0.0443 | 0.0368 |
|  | 0.0518 | 0.0361 | 0.0383 | 0.0622 | 0.0366 | 0.0043 | 0.0040 | 0.0159 | 0.0160 | 0.0111 |
|  | 0.0022 | 0.0026 | 0.0016 | 0.0010 | 0.0089 |        |        |        |        |        |
| * HDV6                                 |        |        |        |        |        |        |        |        |        |        |
| 10                                     | 0.1396 | 0.1768 | 0.1069 | 0.0597 | 0.0367 | 0.0193 | 0.0239 | 0.0634 | 0.0443 | 0.0368 |
|  | 0.0518 | 0.0361 | 0.0383 | 0.0622 | 0.0366 | 0.0043 | 0.0040 | 0.0159 | 0.0160 | 0.0111 |
|  | 0.0022 | 0.0026 | 0.0016 | 0.0010 | 0.0089 |        |        |        |        |        |
| * HDV7                                 |        |        |        |        |        |        |        |        |        |        |
| 11                                     | 0.1396 | 0.1768 | 0.1069 | 0.0597 | 0.0367 | 0.0193 | 0.0239 | 0.0634 | 0.0443 | 0.0368 |
|  | 0.0518 | 0.0361 | 0.0383 | 0.0622 | 0.0366 | 0.0043 | 0.0040 | 0.0159 | 0.0160 | 0.0111 |
|  | 0.0022 | 0.0026 | 0.0016 | 0.0010 | 0.0089 |        |        |        |        |        |
| * HDV8a                                |        |        |        |        |        |        |        |        |        |        |
| 12                                     | 0.1396 | 0.1768 | 0.1069 | 0.0597 | 0.0367 | 0.0193 | 0.0239 | 0.0634 | 0.0443 | 0.0368 |
|  | 0.0518 | 0.0361 | 0.0383 | 0.0622 | 0.0366 | 0.0043 | 0.0040 | 0.0159 | 0.0160 | 0.0111 |
|  | 0.0022 | 0.0026 | 0.0016 | 0.0010 | 0.0089 |        |        |        |        |        |
| * HDV8b                                |        |        |        |        |        |        |        |        |        |        |
| 13                                     | 0.1396 | 0.1768 | 0.1069 | 0.0597 | 0.0367 | 0.0193 | 0.0239 | 0.0634 | 0.0443 | 0.0368 |
|  | 0.0518 | 0.0361 | 0.0383 | 0.0622 | 0.0366 | 0.0043 | 0.0040 | 0.0159 | 0.0160 | 0.0111 |
|  | 0.0022 | 0.0026 | 0.0016 | 0.0010 | 0.0089 |        |        |        |        |        |
| * HDBS                                 |        |        |        |        |        |        |        |        |        |        |
| 14                                     | 0.1396 | 0.1768 | 0.1069 | 0.0597 | 0.0367 | 0.0193 | 0.0239 | 0.0634 | 0.0443 | 0.0368 |
|  | 0.0518 | 0.0361 | 0.0383 | 0.0622 | 0.0366 | 0.0043 | 0.0040 | 0.0159 | 0.0160 | 0.0111 |
|  | 0.0022 | 0.0026 | 0.0016 | 0.0010 | 0.0089 |        |        |        |        |        |
| * HDBT                                 |        |        |        |        |        |        |        |        |        |        |
| 15                                     | 0.0967 | 0.1219 | 0.1170 | 0.0605 | 0.0388 | 0.0292 | 0.0377 | 0.0525 | 0.0505 | 0.0302 |
|  | 0.0290 | 0.0294 | 0.0288 | 0.0811 | 0.0158 | 0.0079 | 0.0075 | 0.0521 | 0.0546 | 0.0405 |
|  | 0.0046 | 0.0036 | 0.0023 | 0.0017 | 0.0062 |        |        |        |        |        |
| * Motorcycles                          |        |        |        |        |        |        |        |        |        |        |
| 16                                     | 0.0939 | 0.1478 | 0.1197 | 0.0847 | 0.0964 | 0.0722 | 0.0584 | 0.0483 | 0.0402 | 0.0295 |
|  | 0.0238 | 0.0223 | 0.0186 | 0.0140 | 0.0130 | 0.0091 | 0.0067 | 0.0066 | 0.0062 | 0.0060 |
|  | 0.0063 | 0.0098 | 0.0084 | 0.0060 | 0.0525 |        |        |        |        |        |

## 2008 Vehicle Registration (097Reg08.D)

REG DIST

\*

\* LDV

1 0.0723 0.0941 0.0891 0.0823 0.0763 0.0716 0.0683 0.0658 0.0583 0.0483  
 0.0443 0.0340 0.0346 0.0273 0.0224 0.0176 0.0155 0.0130 0.0110 0.0083  
 0.0070 0.0054 0.0045 0.0031 0.0256

\* LDT1

2 0.0496 0.0856 0.0728 0.0828 0.0715 0.0663 0.0758 0.0642 0.0540 0.0499  
 0.0535 0.0369 0.0372 0.0339 0.0220 0.0155 0.0138 0.0129 0.0151 0.0099  
 0.0076 0.0102 0.0072 0.0051 0.0466

\* LDT2

3 0.0496 0.0856 0.0728 0.0828 0.0715 0.0663 0.0758 0.0642 0.0540 0.0499  
 0.0535 0.0369 0.0372 0.0339 0.0220 0.0155 0.0138 0.0129 0.0151 0.0099  
 0.0076 0.0102 0.0072 0.0051 0.0466

\* LDT3

4 0.1403 0.1310 0.0869 0.0749 0.0630 0.0457 0.0574 0.0574 0.0467 0.0373  
 0.0346 0.0293 0.0305 0.0249 0.0183 0.0127 0.0104 0.0102 0.0131 0.0116  
 0.0044 0.0064 0.0054 0.0035 0.0441

\* LDT4

5 0.1403 0.1310 0.0869 0.0749 0.0630 0.0457 0.0574 0.0574 0.0467 0.0373  
 0.0346 0.0293 0.0305 0.0249 0.0183 0.0127 0.0104 0.0102 0.0131 0.0116  
 0.0044 0.0064 0.0054 0.0035 0.0441

\* HDV2B

6 0.1362 0.1720 0.1069 0.0594 0.0366 0.0199 0.0248 0.0621 0.0446 0.0360  
 0.0490 0.0351 0.0368 0.0644 0.0336 0.0048 0.0045 0.0205 0.0208 0.0150  
 0.0026 0.0027 0.0017 0.0011 0.0088

\* HDV3

7 0.1362 0.1720 0.1069 0.0594 0.0366 0.0199 0.0248 0.0621 0.0446 0.0360  
 0.0490 0.0351 0.0368 0.0644 0.0336 0.0048 0.0045 0.0205 0.0208 0.0150  
 0.0026 0.0027 0.0017 0.0011 0.0088

\* HDV4

8 0.1362 0.1720 0.1069 0.0594 0.0366 0.0199 0.0248 0.0621 0.0446 0.0360  
 0.0490 0.0351 0.0368 0.0644 0.0336 0.0048 0.0045 0.0205 0.0208 0.0150  
 0.0026 0.0027 0.0017 0.0011 0.0088

\* HDV5

9 0.1362 0.1720 0.1069 0.0594 0.0366 0.0199 0.0248 0.0621 0.0446 0.0360  
 0.0490 0.0351 0.0368 0.0644 0.0336 0.0048 0.0045 0.0205 0.0208 0.0150  
 0.0026 0.0027 0.0017 0.0011 0.0088

\* HDV6

10 0.1362 0.1720 0.1069 0.0594 0.0366 0.0199 0.0248 0.0621 0.0446 0.0360  
 0.0490 0.0351 0.0368 0.0644 0.0336 0.0048 0.0045 0.0205 0.0208 0.0150  
 0.0026 0.0027 0.0017 0.0011 0.0088

\* HDV7

11 0.1362 0.1720 0.1069 0.0594 0.0366 0.0199 0.0248 0.0621 0.0446 0.0360  
 0.0490 0.0351 0.0368 0.0644 0.0336 0.0048 0.0045 0.0205 0.0208 0.0150  
 0.0026 0.0027 0.0017 0.0011 0.0088

\* HDV8a

12 0.1362 0.1720 0.1069 0.0594 0.0366 0.0199 0.0248 0.0621 0.0446 0.0360  
 0.0490 0.0351 0.0368 0.0644 0.0336 0.0048 0.0045 0.0205 0.0208 0.0150  
 0.0026 0.0027 0.0017 0.0011 0.0088

\* HDV8b

13 0.1362 0.1720 0.1069 0.0594 0.0366 0.0199 0.0248 0.0621 0.0446 0.0360  
 0.0490 0.0351 0.0368 0.0644 0.0336 0.0048 0.0045 0.0205 0.0208 0.0150  
 0.0026 0.0027 0.0017 0.0011 0.0088

\* HDBS

14 0.1362 0.1720 0.1069 0.0594 0.0366 0.0199 0.0248 0.0621 0.0446 0.0360  
 0.0490 0.0351 0.0368 0.0644 0.0336 0.0048 0.0045 0.0205 0.0208 0.0150  
 0.0026 0.0027 0.0017 0.0011 0.0088

\* HDBT

15 0.0967 0.1219 0.1170 0.0605 0.0388 0.0292 0.0377 0.0525 0.0505 0.0302  
 0.0290 0.0294 0.0288 0.0811 0.0158 0.0079 0.0075 0.0521 0.0546 0.0405  
 0.0046 0.0036 0.0023 0.0017 0.0062

\* Motorcycles

16 0.0939 0.1478 0.1197 0.0847 0.0964 0.0722 0.0584 0.0483 0.0402 0.0295  
 0.0238 0.0223 0.0186 0.0140 0.0130 0.0091 0.0067 0.0066 0.0062 0.0060  
 0.0063 0.0098 0.0084 0.0060 0.0525



## Appendix C

*Procedures for Processing Requests to Redesignate Areas to Attainment,*  
**John Calcagni, Director, Air Quality Management Division,**  
**U.S. Environmental Protection Agency, Memorandum,**  
**September 4, 1992**



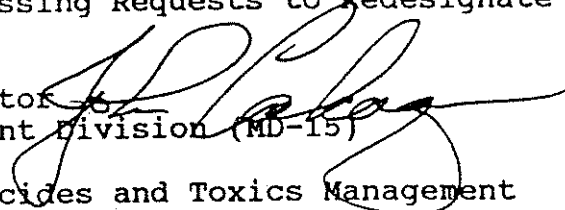


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
Office of Air Quality Planning and Standards  
Research Triangle Park, North Carolina 27711

4 SEP 1992

MEMORANDUM

**SUBJECT:** Procedures for Processing Requests to Redesignate Areas to Attainment

**FROM:** John Calcagni, Director   
Air Quality Management Division (MD-15)

**TO:** Director, Air, Pesticides and Toxics Management Division, Regions I and IV  
Director, Air and Waste Management Division, Region II  
Director, Air, Radiation and Toxics Division, Region III  
Director, Air and Radiation Division, Region V  
Director, Air, Pesticides and Toxics Division, Region VI  
Director, Air and Toxics Division, Regions VII, VIII, IX, and X

Purpose

The Office of Air Quality Planning and Standards (OAQPS) expects that a number of redesignation requests will be submitted in the near future. Thus, Regions will need to have guidance on the applicable procedures for handling these requests, including maintenance plan provisions. This memorandum, therefore, consolidates the Environmental Protection Agency's (EPA's) guidance regarding the processing of requests for redesignation of nonattainment areas to attainment for ozone (O<sub>3</sub>), carbon monoxide (CO), particulate matter (PM-10), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), and lead (Pb). Regions should use this guidance as a general framework for drafting Federal Register notices pertaining to redesignation requests. Special concerns for areas seeking redesignation from unclassifiable to attainment will be addressed on a case-by-case basis.

Background

Section 107(d)(3)(E) of the Clean Air Act, as amended, states that an area can be redesignated to attainment if the following conditions are met:

1. The EPA has determined that the national ambient air quality standards (NAAQS) have been attained.
2. The applicable implementation plan has been fully approved by EPA under section 110(k).
3. The EPA has determined that the improvement in air quality is due to permanent and enforceable reductions in emissions.
4. The State has met all applicable requirements for the area under section 110 and Part D.
5. The EPA has fully approved a maintenance plan, including a contingency plan, for the area under section 175A.

Each of these criteria is discussed in more detail in the following paragraphs. Particular attention is given to maintenance plan provisions at the end of this document since maintenance plans constitute a new requirement under the amended Clean Air Act. Exceptions to the guidance will be considered on a case-by-case basis.

#### 1. Attainment of the Standard

The State must show that the area is attaining the applicable NAAQS. There are two components involved in making this demonstration which should be considered interdependently. The first component relies upon 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. These monitors should remain at the same location for the duration of the monitoring period required for demonstrating attainment. 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. For purposes of redesignation, the Regional Office should verify that the integrity of the air quality monitoring network has been preserved.

For PM-10, an area may be considered attaining the NAAQS if the number of expected exceedances per year, according to 40 CFR 50.6, is less than or equal to 1.0. For O<sub>3</sub>, the area must show that the average annual number of expected exceedances, according to 40 CFR 50.9, is less than or equal to 1.0 based on data from all monitoring sites in the area or its affected downwind environs. In making this showing, both PM-10 and O<sub>3</sub> must rely on 3 complete, consecutive calendar years of quality-assured air quality monitoring data, collected in accordance with 40 CFR 50, Appendices H and K. For CO, an area may be considered attaining the NAAQS if there are no violations, as determined in accordance

with 40 CFR 50.8, based on 2 complete, consecutive calendar years of quality-assured monitoring data. For SO<sub>2</sub>, according to 40 CFR 50.4, an area must show no more than one exceedance annually and for Pb, according to section 50.12, an area may show no exceedances on a quarterly basis.

The second component relies upon supplemental EPA-approved air quality modeling. No such supplemental modeling is required for O<sub>3</sub> nonattainment areas seeking redesignation. Modeling may be necessary to determine the representativeness of the monitored data. For pollutants such as SO<sub>2</sub> and CO, a small number of monitors typically is not representative of areawide air quality or areas of highest concentration. When dealing with SO<sub>2</sub>, Pb, PM-10 (except for a limited number of initial moderate nonattainment areas), and CO (except moderate areas with design values of 12.7 parts per million or lower at the time of passage of the Clean Air Act Amendments of 1990), dispersion modeling will generally be necessary to evaluate comprehensively sources' impacts and to determine the areas of expected high concentrations based upon current conditions. Areas which were designated nonattainment based on modeling will generally not be redesignated to attainment unless an acceptable modeling analysis indicates attainment. Regions should consult with OAQPS for further guidance addressing the need for modeling in specific circumstances.

## 2. State Implementation Plan (SIP) Approval

The SIP for the area must be fully approved under section 110(k),<sup>1</sup> and must satisfy all requirements that apply to the area. It should be noted that approval action on SIP elements and the redesignation request may occur simultaneously. An area cannot be redesignated if a required element of its plan is the subject of a disapproval; a finding of failure to submit or to implement the SIP; or partial, conditional, or limited approval. However, this does not mean that earlier issues with regard to the SIP will be reopened. Regions should not reconsider those things that have already been approved and for which the Clean Air Act Amendments did not alter what is required. In contrast, to the extent the Amendments add a requirement or alter an existing requirement so that it adds something more, Regions should consider those issues. In addition, requests from areas known to be affected by dispersion techniques which are inconsistent with EPA guidance will continue to be considered unapprovable under section 110 and will not qualify for redesignation.

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<sup>1</sup>Section 110(k) contains the requirements for EPA action on plan submissions. It addresses completeness, deadlines, full and partial approval, conditional approval, and disapproval.

### 3. 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.<sup>2</sup> Attainment resulting from temporary reductions in emission rates (e.g., reduced production or shutdown due to temporary adverse economic conditions) or unusually favorable meteorology would not qualify as an air quality improvement due to permanent and enforceable emission reductions.

In making this showing, the State should estimate the percent reduction (from the year that was used to determine the design value for designation and classification) achieved from Federal measures such as the Federal Motor Vehicle Control Program and fuel volatility rules as well as control measures that have been adopted and implemented by the State. This estimate should consider emission rates, production capacities, and other related information to clearly show that the air quality improvements are the result of implemented controls. The analysis should assume that sources are operating at permitted levels (or historic peak levels) unless evidence is presented that such an assumption is unrealistic.

### 4. Section 110 and Part D Requirements

For the 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. When evaluating a redesignation request, Regions should not consider whether the State has met requirements that come due under the Act after submittal of a complete redesignation request.<sup>3</sup>

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<sup>2</sup>This is consistent with EPA's existing policy on redesignations as stated in an April 21, 1983 memorandum titled "Section 107 Designation Policy Summary." This memorandum states that in order for an area to be redesignated to attainment, the State must show that "actual enforceable emission reductions are responsible for the recent air quality improvement." This element of the policy retains its validity under the amended Act pursuant to section 193. [Note: other aspects of the April 21, 1983 memorandum have since been superseded by subsequent memorandums; interested parties should consult with OAQPS before relying on these aspects, e.g. those relating to required years of air quality data.]

<sup>3</sup>Under section 175A(c), however, the requirements of Part D remain in force and effect for the area until such time as it is redesignated. Upon redesignation to attainment, the requirements that became due under section 175A(c) after submittal of the complete redesignation request would no longer be applicable.

However, any requirements that came due prior to submittal of the redesignation request must be fully approved into the plan at or before the time EPA redesignates the area.

To avoid confusion concerning what requirements will be applicable for purposes of redesignation, Regions should encourage States to work closely with the appropriate Regional Office early in the process. This will help to ensure that a redesignation request submitted by the State has a high likelihood of being approved by EPA. Regions should advise States of the practical planning consequences if EPA disapproves the redesignation request or if the request is invalidated because of violations recorded during EPA's review. Under such circumstances, EPA does not have the discretion to adjust schedules for implementing SIP requirements. As a result, an area may risk sanctions and/or Federal implementation plan implementation that could result from failure to meet SIP submittal or implementation requirements.

a. Section 110 Requirements

Section 110(a)(2) contains general requirements for nonattainment plans. Most of the provisions of this section are the same as those contained in the pre-amended Act. We will provide guidance on these requirements as needed.<sup>4</sup>

b. Part D Requirements

Part D consists of general requirements applicable to all areas which are designated nonattainment based on a violation of the NAAQS. The general requirements are followed by a series of subparts specific to each pollutant. The general requirements appear in subpart 1. The requirements relating to O<sub>3</sub>, CO, PM-10, SO<sub>2</sub>, NO<sub>2</sub>, and Pb appear in subparts 2 through 5. In those instances where an area is subject to both the general nonattainment provisions in subpart 1 as well as one of the pollutant-specific subparts, the general provisions may be subsumed within, or superseded by, the more specific requirements of subparts 2 through 5.

If an area was not classified under section 181 for O<sub>3</sub>, or section 186 for CO, then that area is only subject to the provisions of subpart 1, "Nonattainment Areas in General." In addition to relevant provisions in subpart 1, an O<sub>3</sub> and CO area, which is classified, must meet all applicable requirements in subpart 2, "Additional Provisions for Ozone Nonattainment Areas," and subpart 3, "Additional Provisions for Carbon Monoxide

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<sup>4</sup>General guidance regarding the requirements for SIP's may be found in the "General Preamble to Title I of the 1990 Clean Air Act Amendments," 57 FR 13498 (April 16, 1992).

Nonattainment Areas," respectively, before the area may be redesignated to attainment. All PM-10 nonattainment areas (whether classified as moderate or serious) must similarly meet the applicable general provisions of subpart 1 and the specific PM-10 provisions in subpart 4, "Additional Provisions for Particulate Matter Nonattainment Areas." Likewise, SO<sub>2</sub>, NO<sub>2</sub>, and Pb nonattainment areas are subject to the applicable general nonattainment provisions in subpart 1 as well as the more specific requirements in subpart 5, "Additional Provisions for Areas Designated Nonattainment for Sulfur Oxides, Nitrogen Dioxide, and Lead."

i. Section 172(c) Requirements

This section contains general requirements for nonattainment plans. A thorough discussion of these requirements may be found in the General Preamble to Title I [57 FR 13498 (April 16, 1992)]. The EPA anticipates that areas will already have met most or all of these requirements to the extent that they are not superseded by more specific Part D requirements. 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. The requirements of the Part D new source review program will be replaced by the prevention of significant deterioration (PSD) program once the area has been redesignated. However, in order to ensure that the PSD program will become fully effective immediately upon redesignation, either the State must be delegated the Federal PSD program or the State must make any needed modifications to its rules to have the approved PSD program apply to the affected area upon redesignation.

ii. Conformity

The State must work with 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. Additionally, we currently interpret the conformity requirement to apply to attainment areas. However, EPA has not yet issued its conformity regulations specifying what areas are subject to the conformity requirement. Therefore, 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 EPA's conformity regulation upon issuance, as applicable. If the State submits the redesignation request subsequent to EPA's issuance of the conformity regulations, and the conformity requirement became applicable to the area prior to submission,

the State must adopt the applicable conformity requirements before EPA can redesignate the area.

#### 5. Maintenance Plans

Section 107(d)(3)(E) of the amended Act stipulates that for an area to be redesignated, EPA must fully approve a maintenance plan which meets the requirements of section 175A. A State may submit both the redesignation request and the maintenance plan at the same time and rulemaking on both may proceed on a parallel track. Maintenance plans may, of course, be submitted and approved by EPA before a redesignation is requested. However, according to section 175A(c), pending approval of the maintenance plan and redesignation request, all applicable nonattainment area requirements shall remain in place.

Section 175A defines the general framework of a maintenance plan. 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 175A further states that the plan shall contain such additional measures, if any, as may be necessary to ensure such maintenance. Because the Act requires a demonstration of maintenance for 10 years after an area is redesignated (not 10 years after submittal of a redesignation request), the State should plan for some lead time for EPA action on the request. In other words, the maintenance demonstration should project maintenance for 10 years, beginning from a date which factors in the time necessary for EPA review and approval action on the redesignation request. In determining the amount of lead time to allow, States should consider that section 107(d)(3)(D) grants the Administrator up to 18 months from receipt of a complete submittal to process a redesignation request. The statute also requires the State to submit a revision of the SIP 8 years after the original redesignation request is approved to provide for maintenance of the NAAQS for an additional 10 years following the first 10-year period [see section 175A(b)].

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 [see section 175A(d)]. The Act provides that, 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. Failure to maintain the NAAQS and triggering of the contingency plan will not necessitate a revision of the SIP unless required by the Administrator, as stated in section 175A(d).

The following is a list of core provisions that we anticipate will be necessary to ensure maintenance of the relevant NAAQS in an area seeking redesignation from

nonattainment to attainment. We therefore recommend that States seeking redesignation of a nonattainment area consider these provisions. However, any final EPA determination regarding the adequacy of a maintenance plan will be made following review of the plan submittal in light of the particular circumstances facing the area proposed for redesignation and based on all relevant information available at the time.

a. Attainment Inventory

The State should develop an attainment emissions inventory to identify the level of emissions in the area which is sufficient to attain the NAAQS.<sup>5</sup> This inventory should be consistent with EPA's most recent guidance on emission inventories for nonattainment areas available at the time and should include the emissions during the time period associated with the monitoring data showing attainment.<sup>6</sup>

Source size thresholds are 100 tons/year for SO<sub>2</sub>, NO<sub>2</sub>, and PM-10 areas, and 5 tons/year for Pb based upon 40 CFR 51.100(k) and 51.322, as well as established practice for AIRS data. The source size threshold for serious PM-10 areas is 70 tons/year

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<sup>5</sup>Where the State has made an adequate demonstration that air quality has improved as a result of the SIP (as discussed previously), the attainment inventory will generally be the actual inventory at the time the area attained the standard.

<sup>6</sup>The EPA's current guidance on the preparation of emission inventories for O<sub>3</sub> and CO nonattainment areas is contained in the following documents: "Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone: Volume I" (EPA-450/4-91-016), "Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone: Volume II" (EPA-450/4-91-014), "Emission Inventory Requirements for Ozone State Implementation Plans" (EPA-450/4-91-010), "Emission Inventory Requirements for Carbon Monoxide Implementation Plans" (EPA-450/4-91-011), "Guideline for Regulatory Application of the Urban Airshed Model" (EPA-450/4-91-013), "Procedures for Emission Inventory Preparation: Volume IV, Mobile Sources" (EPA-450/4-81-026d), and "Procedures for Preparing Emission Inventory Projections" (EPA-450/4-91-019). The EPA does not currently have specific guidance on attainment emissions inventories for SO<sub>2</sub>. In lieu thereof, States are referred to the guidance on emissions data to be used as input to modeling demonstrations, contained in Table 9.1 of EPA's "Guideline on Air Quality Models (Revised)" (EPA-450/2-78-027R), July 1987, which is generally applicable to all criteria pollutants. Emission inventory procedures and requirements documents are currently being prepared by OAQPS for PM-10 and Pb; these documents are due for release by summer 1992.

according to Clean Air Act section 189(b)(3). However, the inventory should include sources below these size thresholds if these smaller sources were included in the SIP attainment demonstration. Where sources below the 100, 70, and 5 tons/year-size thresholds (e.g., areas with smaller source size definitions) are subject to a State's minor source permit program, these sources need only be addressed in the aggregate to the extent that they result in areawide growth.

For O<sub>3</sub> nonattainment areas, the inventory should be based on actual "typical summer day" emissions of O<sub>3</sub> precursors (volatile organic compounds and nitrogen oxides) during the attainment year. This will generally correspond to one of the periodic inventories required for nonattainment areas to reconcile milestones. For CO nonattainment areas, the inventory should be based on actual "typical CO season day" emissions for the attainment year. This will generally correspond to one of the periodic inventories required for nonattainment areas.

b. Maintenance Demonstration

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 emission rates will not cause a violation of the NAAQS. Under the Clean Air Act, many areas are required to submit modeled attainment demonstrations to show that proposed reductions in emissions will be sufficient to attain the applicable NAAQS. For these areas, the maintenance demonstration should be based upon the same level of modeling. In areas where no such modeling was required, the State should be able to rely on the attainment inventory approach. In both instances, the demonstration should be for a period of 10 years following the redesignation.

Where modeling is relied upon to demonstrate maintenance, each plan should contain a summary of the air quality concentrations expected to result from application of the control strategy. In the process, the plan should identify and describe the dispersion model or other air quality model used to project ambient concentrations (see 40 CFR 51.46).

In either case, to satisfy the demonstration requirement the State should project emissions for the 10-year period following redesignation, either for the purpose of showing that emissions will not increase over the attainment inventory or for conducting modeling.<sup>7</sup> The projected inventory should consider future growth, including population and industry, should be consistent

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<sup>7</sup>Guidance for projecting emissions may be found in the emissions inventory guidance cited in footnote 6.

with the attainment inventory, and should document data inputs and assumptions. All elements of the demonstration (e.g., emission projections, new source growth, and modeling) should be consistent with current EPA modeling guidance.<sup>8</sup> For O<sub>3</sub> and CO, the projected emissions should reflect the expected actual emissions based on enforceable emission rates and typical production rates.

For CO, a State should address the areawide component of the maintenance demonstration either by showing that future CO emissions will not increase or by conducting areawide modeling. Preferably, the State should carry out hot-spot modeling that is consistent with the Guideline on Air Quality Models (Revised), in order to demonstrate maintenance of the NAAQS. In particular, if the nonattainment problem is related to a pattern of hot-spots then hot-spot modeling should generally be conducted. However, hot-spot modeling is not automatically required. For example, if the nonattainment problem was related solely to stationary point sources, or if highway improvements have been implemented and the associated emission reductions and travel characteristics can be qualitatively documented, then hot-spot modeling is not required. In such cases, adequate documentation as well as the concurrence of Headquarters is needed.

Any assumptions concerning emission rates must reflect permanent, enforceable measures. In other words, a State generally cannot take credit in the maintenance demonstration for reductions unless there are regulations in place requiring those reductions or the reductions are otherwise shown to be permanent. Therefore, the State will be expected to maintain its implemented control strategy despite redesignation to attainment, unless such measures are shown to be unnecessary for maintenance or are replaced with measures that achieve equivalent reductions (see additional discussion under "Contingency Plan"). Emission reductions from source shutdowns can be considered permanent and enforceable to the extent that those shutdowns have been reflected in the SIP and all applicable permits have been modified accordingly.

Modeling used to demonstrate attainment may be relied upon in the maintenance demonstration where the modeling conforms to current EPA guidance and where the State has projected no significant changes in the modeling inputs during the intervening time. Where the original attainment demonstration may no longer be relied upon, States will be expected to remodel using current

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<sup>8</sup>The EPA-approved modeling guidance may be found in the following documents: "Guideline on Air Quality Models (Revised)," OAQPS, RTP, NC (EPA-450/2-78-027R), July 1986; and "PM-10 SIP Development Guideline," OAQPS, RTP, NC (EPA-450/2-86-001), June 1987.

EPA referenced techniques.<sup>9</sup> This may be necessary where, for example, there has been a change in emissions or a change in the siting of new sources or modifications such that air quality may no longer be accurately represented by the existing modeling.

c. Monitoring Network

Once an area has been redesignated, the State should continue to operate an appropriate air quality monitoring network, in accordance with 40 CFR Part 58, to verify the attainment status of the area. The maintenance plan should contain provisions for continued operation of air quality monitors that will provide such verification. In cases where measured mobile source parameters (e.g., vehicle miles traveled congestion) have changed over time, the State may also need to perform a saturation monitoring study to determine the need for, and location of, additional permanent monitors.

d. Verification of Continued Attainment

Each State should ensure that it has the legal authority to implement and enforce all measures necessary to attain and to maintain the NAAQS. Sections 110(a)(2)(B) and (F) of the Clean Air Act, as amended, and regulations promulgated at 40 CFR 51.110(k), suggest that one such measure is the acquisition of ambient and source emission data to demonstrate attainment and maintenance.

Regardless of whether the maintenance demonstration is based on a showing that future emission inventories will not exceed the attainment inventory or on modeling, the State submittal should indicate how the State will track the progress of the maintenance plan. This is necessary due to the fact that the emission projections made for the maintenance demonstration depend on assumptions of point and area source growth.

One option for tracking the progress of the maintenance demonstration, provided here as an example, would be for the State to periodically update the emissions inventory. In this case, the maintenance plan should specify the frequency of any planned inventory updates. Such an update could be based, in part, on the annual AIRS update and could indicate new source growth and other changes from the attainment inventory (e.g., changes in vehicle miles travelled or in traffic patterns). As an alternative to a complete update of the inventory, the State may choose to do a comprehensive review of the factors that were used in developing the attainment inventory to show no significant change. If this review does show a significant change, the State should then perform an update of the inventory.

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<sup>9</sup>See references for modeling guidance cited in footnote 8.

Where the demonstration is based on modeling, an option for tracking progress would be for the State to periodically (typically every 3 years) reevaluate the modeling assumptions and input data. In any event, the State should monitor the indicators for triggering contingency measures (as discussed below).

e. Contingency Plan

Section 175A of the Act also requires that a maintenance plan include contingency provisions, as necessary, to promptly correct any violation of the NAAQS that occurs after redesignation of the area. These contingency measures are distinguished from those generally required for nonattainment areas under section 172(c)(9) and those specifically required for O<sub>3</sub> and CO nonattainment areas under sections 182(c)(9) and 187(a)(3), respectively. For the purposes of section 175A, a State is not required to have fully adopted contingency measures that will take effect without further action by the State in order for the maintenance plan to be approved. However, the contingency plan is considered to be an enforceable part of the SIP and should ensure that the contingency measures are adopted expediently once they are triggered. The plan should clearly identify the measures to be adopted, a schedule and procedure for adoption and implementation, and a specific time limit for action by the State. As a necessary part of the plan, the State should also identify specific indicators, or triggers, which will be used to determine when the contingency measures need to be implemented.

Where the maintenance demonstration is based on the inventory, the State may, for example, identify an "action level" of emissions as the indicator. If later inventory updates show that the inventory has exceeded the action level, the State would take the necessary steps to implement the contingency measures. The indicators would allow a State to take early action to address potential violations of the NAAQS before they occur. By taking early action, States may be able to prevent any actual violations of the NAAQS and, therefore, eliminate the need on the part of EPA to redesignate an area to nonattainment.

Other indicators to consider include monitored or modeled violations of the NAAQS (due to the inadequacy of monitoring data in some situations). It is important to note that air quality data in excess of the NAAQS will not automatically necessitate a revision of the SIP where implementation of contingency measures is adequate to address the cause of the violation. The need for a SIP revision is subject to the Administrator's discretion.

The EPA will review what constitutes a contingency plan on a case-by-case basis. At a minimum, it must require that the State will implement all measures contained in the Part D nonattainment

plan for the area prior to redesignation [see section 175A(d)]. This language suggests that a State may submit a SIP revision at the time of its redesignation request to remove or reduce the stringency of control measures. Such a revision can be approved by EPA if it provides for compensating equivalent reductions. A demonstration that measures are equivalent would have to include appropriate modeling or an adequate justification. Alternatively, a State might be able to demonstrate (through EPA-approved modeling) that the measures are not necessary for maintenance of the standard. In either case, the contingency plan would have to provide for implementation of any measures that were reduced or removed after redesignation of the area.

### Summary

As stated previously, this memorandum consolidates EPA's redesignation and maintenance plan guidance and Regions should rely upon it as a general framework in drafting Federal Register notices. It is strongly suggested that the Regional Offices share this document with the appropriate States. This should give the States a better understanding of what is expected from a redesignation request and maintenance plan under existing policy. Any necessary changes to existing Agency policy will be made through our action on specific redesignation requests and the review of section 175A maintenance plans for these particular areas, both of which are subject to notice and comment rulemaking procedures. Thus, in applying this memorandum to specific circumstances in a rulemaking, Regions should consider the applicability of the underlying policies to the particular facts and to comments submitted by any person. If your staff members have questions which require clarification, they may contact Sharon Reinders at (919) 541-5284 for O<sub>3</sub>- and CO-related issues, and Eric Ginsburg at (919) 541-0877 for SO<sub>2</sub>-, PM-10-, and Pb-related issues.

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## **Appendix D**

### **State Implementation Plan Revision Public Comment and Hearing Documentation**



## **Appendix D.1**

### **Notice of Public Hearing**



## **Appendix D.2**

### **Public Hearing Agenda**



**Appendix D.3**

**Public Hearing Sign In Sheet**



**Appendix D.4**

**Public Hearing Officer Certification and Transcript**



## **Appendix D.5**

### **Public Comments**



## **Appendix D.6**

### **Responsiveness Summary**

