ATTACHMENT J

Comments from Other Stakeholders

Summary of Stakeholder Comments on the Reasonable Progress Modeling Draft Report

January 29, 2008

The draft report entitled, "*MANE-VU Modeling for Reasonable Progress Goals*" was completed by NESCAUM on December 10, 2007. On December 12, 2007, MARAMA requested comments from MANE-VU Stakeholders by January 9, 2008. Six stakeholders have commented on the document and their comments are summarized below. Comments were received from the following: the Council of Industrial Boiler Owners (CIBO) via John Woolf of Bracewell and Giuliani LLP, Dominion Resources Services, Inc., Midwest Ozone Group (MOG) via Edward Kropp of Jackson Kelly PLLC, John Shimshock of Reliant Energy, Inc., Utility Air Regulatory Group (UARG) via Andrea Field of Hunton and Williams, and MARAMA via Angela King.

Comments

UARG stated that it is not necessary or appropriate for MANE-VU to ask other states to change course now to include additional control measures in their regional haze SIPs, especially since these regulatory requirements come up very late in the regional haze state implementation plan (SIP) development process. Existing measures and other measures included in the state plans that have been drafted or proposed for comment are adequate (and, in some cases, more than adequate) to achieve visibility improvements approaching or going beyond the uniform rate of progress for their own and other states' Class I areas. In these circumstances, neither the Clean Air Act nor EPA's rules and guidance would require states to include additional control measures in their regional haze SIPs. The fact that MANE-VU claims that additional "measures are reasonable to implement" (Draft RPG Modeling Report at 6-1) does not change anything: no EPA rules or guidance requires other regional planning organizations at this late date to revise their draft or final regional haze plans to address or incorporate the list of additional control measures included in the draft MANE-VU reports.

MOG stated that requiring the implementation of control strategies that result in visibility improvement beyond the improvement necessary to meet the uniform glide slope is neither necessary under the Regional Haze Rule nor an efficient use of resources. MOG therefore urges MANE-VU to accept the benefits of on the books control strategies, many of which not yet fully implemented and that result in attainment of reasonable progress as defined by EPA, rather than continue to press for implementation of additional control strategies that are simply unnecessary to comply with the Regional Haze Rule and, more importantly, strain an already unstable economy. CIBO agrees with MOG, stating controls beyond those required to meet already stringent standards is neither justified by applicable law, nor by the significant additional burden on sources that will result. Sources have made significant capital investments to meet mandatory measures and the resulting environmental benefits will likewise be significant.

Reliant stated that further emission reductions beyond "on-the-books/on-the-way" regulations are unnecessary for achieving the 2018 regional haze rule milestones. Before any further emission reductions are mandated, Reliant Energy recommends that U.S. EPA plan a comprehensive assessment of the effects on measured visibility of the first Regional Haze Rule implementation period and a reassessment of model performance at that time.

Dominion noted that all Class I areas within the MANE-VU region will achieve significant visibility improvements beyond the uniform glide path by 2018. Therefore emission reduction measures already in progress or that will be implemented to meet CAIR and other regulatory requirements are sufficient and in fact exceed requirements to demonstrate reasonable progress under EPA's Regional Haze Regulation.

Dominion also stated that while the MANE-VU analysis accounts for and captures projected visibility improvements from source-specific BART requirements in the Northeast region, it does not account for the potential impact of BART-specific reductions in neighboring regional planning organizations (RPOs) that could provide some additional level of visibility improvement in MANE-VU Class I areas.

Dominion questions whether MANE-VU is justified in determining from a broad-based perspective that a 90 percent sulfur dioxide (SO_2) reduction for all electric generating units (EGUs) identified as affecting visibility in the MANE-VU region is reasonable under the reasonable progress provisions of the regional haze rules. Furthermore, sources already subject to BART are in the process of completing the required BART analysis, which encompasses an assessment of the same factors that must be addressed in establishing reasonable progress. Thus, any source that has already been subject to a BART determination assessment should be exempt from any further requirements. EPA implies this conclusion in its final guidance, observing that it is not necessary for states to reassess the reasonable progress factors for sources subject to BART for which the states have already completed a BART analysis (EPA *Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program*, June 1, 2007, page 5-1).

Dominion noted that several of the EGUs identified by MANE-VU as "most likely to affect" visibility in certain Class I areas within the MANE-VU region are owned and operated by Dominion. Specifically, Mt. Storm Units 1-3, Chesterfield Units 4-6, Chesapeake Energy Center Units 3 and 4, Yorktown Units 1-3, Brayton Point Units 1-3, and Salem Harbor Units 1-3.

Dominion stated it is already implementing an aggressive emission reduction control program across its fossil generation fleets in the Mid-Atlantic, New England, and Midwest regions. This program includes the very sources identified in the MANE-VU list of 167 "select" EGUs. For more information on the controls and the specific facilities and units see the Dominion comment.

Dominion does not believe that the implementation of a "blanket" control strategy across a select list of sources that are either already taking measures to reduce emissions under

CAIR or already undertaking BART analyses is needed to demonstrate reasonable progress. According to Dominion, as the MANE-VU modeling analysis clearly shows, existing and planned programs already "on-the-books" and "on-the-way" will achieve progress beyond the requirements identified in the uniform glide paths the states have already set for Class I areas.

Reliant is concerned that MANE-VU's base year 2002 inventory is different from emissions estimates originally submitted to the states by industrial facilities. They stated that some estimates of sulfur dioxide, nitrogen oxides (NOx), and fine particulate matter (primary $PM_{2.5}$) emissions in the future year inventories appear to be implausible. Reliant would welcome the opportunity to work with MANE-VU and NESCAUM to develop a mutually-agreeable 2002 emission inventory for their facilities and to investigate and critically review the assumptions used to develop the future year's inventories. With regards to the future year inventories, Reliant Energy understands that these do not incorporate recent New Source Review settlements that have specified the installation of control equipment and the permanent retirement of allowances which would be made available through the operation of this emissions control equipment.

Reliant stated that results from various future year model runs are presented in the report and in several instances, the conclusions deduced by NESCAUM do not appear to be supported by the model runs.

Section 1

Reliant stated that a critical review of the 2009 and 2018 projected emissions inventories needs to be performed. Reliant asserts that a 153 percent and a 360 percent increase in $PM_{2.5}$ emissions in 2009 from New Jersey and Pennsylvania EGUs, respectively, is implausible considering that emissions of SO_2 and NO_x are predicted to decrease by at least 45 percent.

Section 2

Reliant stated that poor modeled meteorological performance during the summer period has significant implications for conclusions regarding source attribution for regional haze impacts.

Reliant stated that some of the figures presented in the report have best fit lines drawn in that do not appear to match the line one would eyeball that would pass through the peak values. Since the peak values are most important in determining the trend of the worst 20 percent regional haze days, it makes sense to reconsider the best-fit lines for this purpose. These alternative slopes lead to conclusions that the CMAQ model's peak predictions are too high (i.e., the model is over-responding, especially on the worst 20 percent regional haze days), and can result in a conclusion that certain emission components have an exaggerated effect on visibility.

Section 3

Reliant stated that the issue of how natural background is determined for the PSD Class I areas should be re-evaluated. The report indicates that ammonium sulfate is identified as the largest contributor to haze at MANE-VU Class I areas and virtually all ammonium sulfate is assumed to be the result of man-made emissions. However, the contribution of natural biogenic sources of ammonia, organic carbon, and sulfates may not be properly considered in the determination of naturally-occurring background visibility.

Section 5

Reliant stated that there may be double-counting of benefits with the "167 EGU Strategy."

Reliant stated that all the control strategies tested result in insignificant changes in $PM_{2.5}$ concentrations, even though the report mentions that the 167 EGU emission reductions will result in "significant reductions."

Reliant stated that the projected rates of visibility improvement do not appear to account for SO_2 and NO_x emission reductions required under Phase II CAIR.

Reliant stated that for the "167 EGU Strategy," there are apparent inconsistencies between the average change in 24-hour $PM_{2.5}$ concentrations and projected visibility improvement at selected Class I areas located in the northern NESCAUM states.

Reliant stated that there are insufficient details regarding the modeling runs, such as those conducted under the reduced sulfur fuel content control strategy. The details of emissions inputs to all of the modeling runs described in the report need to be made available to the public.

Minor Changes

MARAMA pointed out that on page 1-3, footnote number 3 should be moved to page 1-2.

MARAMA stated that on page 1-11, the password for the MARAMA ftp site needs to be included so that the MANE-VU inventory can be accessed. The password is "exchange." Please make this change throughout the document (i.e. page 1-12, regarding MRPO's BaseK inventory).

MARAMA stated that on page 1-15, the password for the second MARAMA ftp site needs to be included so that the CENRAP point source inventory can be accessed. The password is "emisdata." Please make this change through the document.

MARAMA noted that on page 1-19, sub-section 1.3.5, in number 5, the word "into" should be change to "in."

MARAMA noted that after page 1-21, the page numbers are inconsistent (i.e. chapter 2 begins with page 2-22, in chapter 2 page 28 does not have a chapter number, section 2.2 starts on page 2-1, section 3 begins with page 3-10, etc).

MARAMA stated that at the bottom of page 2-2, the second to last paragraph is repeated.

MARAMA stated that on page 2-3, Figures 2-16 and 2-17 are numbered incorrectly.

Reliant stated that in section 4, results from both CMAQ and REMSAD are shown, but there is little discussion regarding the consistency of these modeling results.

Reliant stated that section 4 says that an important "region" for Acadia especially is "SE_BC", but the meaning of this term and others in the figures needs more explanation.

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January 9, 2008

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By E-Mail Transmission

Re: ACCCE Comments on "Public Health Benefits of Reducing Ground-Level Ozone and Fine Particulate Matter in the Northeastern U.S."

Dear Susan:

I am writing on behalf of the American Coalition for Clean Coal Electricity ("ACCCE") regarding the Draft Report by NESCAUM, "Public Health Benefits of Reducing Ground-level Ozone and Fine Particulate Matter in the Northeastern U.S." (November 14, 2007). ACCCE is the successor organization to CEED, effective January 1, 2008. The NESCAUM Draft Report was cited in support of various MANE-VU regional haze initiatives at the MANE-VU stakeholders meeting on November 15, 2007.

ACCCE is a national membership organization representing major U.S. railroads, coal producers, electric generators and numerous other industrial firms. ACCCE members have direct and substantial interests in the production and transportation of coal, and in coal-based electric generation in the Northeast and throughout the United States. Through CEED, ACCCE has contributed several comments to the MANE-VU regional haze planning process, and has participated in both the OTC and MANE-VU stakeholder processes.

Summary of Comments

ACCCE is pleased that all of the Class I areas within MANE-VU are expected to meet or to surpass their EPA-recommended "glide path" targets for achieving reasonable progress toward regional haze goals, based on emission reductions resulting from EPA's Clean Air Interstate Rule (CAIR) and other federal and state air quality programs.[1] We are not persuaded that any of the proposed controls on electric generating units discussed in the NESCAUM report - within MANE-VU or in other RPOs - are warranted in view of the extent of visibility improvement expected at MANE-VU Class I areas under current law.

We are more concerned about the policy implications of the NESCAUM draft report, assessing the potential health benefits of control strategies to improve visibility at Class I parks and wilderness areas, and to achieve air quality levels below those required by U.S. EPA's current and proposed ambient standards for ozone and PM2.5. The latter analyses may be appropriate for U.S. EPA to consider in the context of its regular reviews of the adequacy of the NAAQS. Our comments here focus particularly on NESCAUM's BART and "167 Stack" analyses using the BenMAP model. We believe that NESCAUM's analyses of potential BART and "167 Stack" emission controls on electric generating units are deficient, or are otherwise objectionable, in several key respects:

1) The Clean Air Act's visibility protection program for Class I parks and wilderness areas is not intended to provide public health benefits such as those resulting from implementation of the National Ambient Air Quality Standards. As implemented through the 1999 Regional Haze Rule and related EPA regulations, the visibility protection program provides welfare-related benefits in the form of improved visibility, and protection against visibility deterioration, at protected Class I areas.

2) NESCAUM's analysis of the potential health benefits of alternative control strategies is not required or even recommended by current U.S. EPA guidance on assessing reasonable progress toward regional haze goals.

[1] See, C. Salmi and G. Kleiman, "The MANE-VU Approach to Improving Visibility," MANE-VU Stakeholder Briefing, November 15, 2007 (available at http://www.manevu.org/meetings.asp#).

3) NESCAUM's estimates of potential health benefits from BART and "167 Stack" control strategies overlook potential offsetting ambient air quality effects when emission trading is allowed.

4) NESCAUM's assumption that "CAIR-Plus" control strategies could be imposed with restrictions on emission trading is inconsistent with relevant legal precedent, would undermine the cost-effectiveness of the CAIR program, and could lead to the premature retirements of many smaller generating units that are not economic retrofit candidates.

5) NESCAUM likely has underestimated the extent of emission reductions associated with implementation of CAIR, and thus has overestimated the extent of air quality improvement resulting from its BART and "167 Stack" strategies.

Each of these issues is addressed in more detail below.

Misleading health benefits assessment

NESCAUM relies on the BenMAP desktop PC model to support claims that implementation of BART or "167 Stack" control strategies would generate significant public health benefits within and outside of the MANE-VU region.

NESCAUM's calculations suggest that the "167 Stack" strategy could generate $6.5 billion in annual health benefits within MANE-VU in 2018, primarily due to reduced premature mortality. Benefits of $2.1 billion in the VISTAS region and $2.2 billion in the Midwest RPO states also are estimated.[2]

ACCCE does not agree with the methodology or assumptions underlying the BenMAP analysis, for reasons discussed in comments previously submitted to the Midwest RPO by Cambridge Environmental,[3] and attached here. We note that similar analyses of "CAIR-Plus" strategies evaluated for MRPO by Stratus Consulting in 2006 also presented alternative modeling results based on unrestricted emission trading.

[2] NESCAUM, Draft Report at 4-11,12.

[3] Dr. Laura Green, Cambridge Environmental Inc., "Comments on 'Benefit Study of MRPO Candidate Control Options for Electricity Generation,' (November 17, 2006).

Stratus' findings for MRPO, summarized in the IPM cases modeled below, indicate that the potential downwind impacts of emissions "leakage" from the MRPO region largely offset the benefits of controls imposed within the MRPO. When unrestricted emission trading is permitted, the emission reductions resulting from CAIR-Plus controls within the MRPO region generate tradable allowances that can be sold outside the region. The Stratus analysis illustrates the effects of such trading in states outside the MPRO region, based on IPM modeling of annual $PM_{2.5}$ concentrations:

Modeled $PM_{2.5}$ Impacts from MRPO CAIR-Plus Strategies
with Interstate Emissions Trading

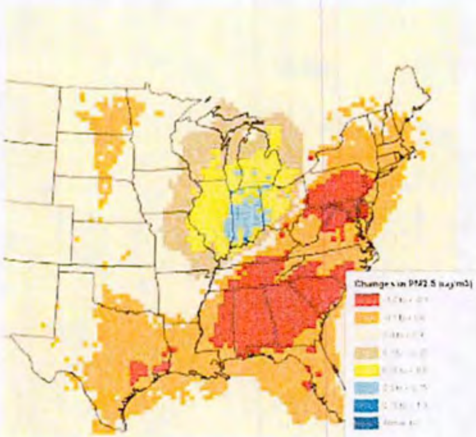

Figure ES-3. Changes in annual mean $PM_{2.5}$ with EGU1 with IPM candidate control program.

Note: Positive values indicate an improvement in $PM_{2.5}$ levels. Negative values indicate a worsening of $PM_{2.5}$ levels.

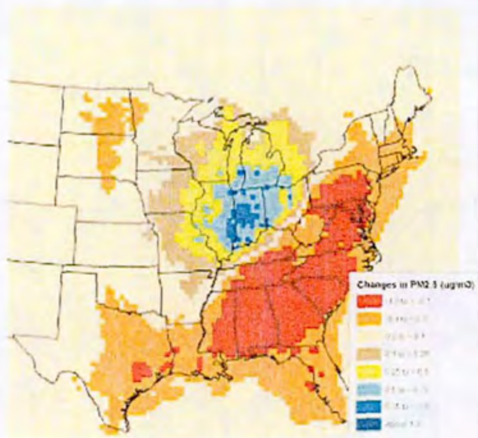

Figure ES-4. Changes in annual mean $PM_{2.5}$ with EGU2 with IPM candidate control program.

Source: Stratus Consulting, Inc. (Report prepared for MRPO, 2006).

Inconsistencies with U.S. EPA Guidance

NESCAUM's assessment of the potential health benefits of the EGU strategies is not called for by current U.S. EPA guidance on measuring reasonable progress toward regional haze goals.[4] EPA's recent guidance discusses the four statutory factors to be considered in determining appropriate source controls to achieve reasonable progress goals. In fact, EPA makes no reference whatsoever to "public health" as a consideration. The only reference to "health" is to the health of affected industries:

> "The first factor to take into consideration is the "costs of compliance." In this context we believe that the cost of compliance factor can be interpreted to encompass the cost of compliance for individual sources or source categories, and more broadly the implication of compliance costs to the health and vitality of industries within a state."[5]

ACCCE agrees that public health considerations are relevant to state strategies for attaining health-protective primary National Ambient Air Quality Standards for pollutants such as ozone and PM2.5. However, public health is not a relevant consideration for strategies to achieve welfare-related reasonable progress toward visibility improvement goals at Class I national parks and wilderness areas.

Constraints on emissions trading

The only means to confine the emissions reductions and associated air quality benefits due to the application of "CAIR-Plus" strategies is to limit emissions trading of surplus allowances outside affected states. NESCAUM apparently has assumed just such limitations in its analyses of these strategies.[6]

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[4] U.S. EPA, "Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program" (June 1, 2007).

[5] Id., at 18.

[6] See, e.g., NESCAUM Draft Report at Figure 4-5 (average change in 24-hour PM2.5 due to 167 Stack emission reduction.) There is no corresponding analysis of the offsetting air quality impacts of the sale of excess allowances that may be created by the 167 Stack strategy, comparable to the IPM modeling for MRPO discussed above.

Requiring 90% emission reduction levels on 110 units (of 246 total units covered by the "167 Stack" strategy) projected by the IPM model to be uncontrolled or partially controlled in 2018 would require the retrofit of scrubbers on numerous older and smaller units that are not economic to retrofit. The cost-effectiveness of the CAIR program depends on the ability to concentrate retrofit controls on newer and larger units, using emission allowances to offset a portion of the emissions of uneconomic units.

NESCAUM should provide a credible assessment of the potential impact of its "167 Stack" proposal on the premature retirement of the older and smaller units that are not retrofitted with scrubbers in the IPM model, including impacts on natural gas utilization and system reliability. Impeding emissions trading and mandating scrubber retrofits on units that are not economic to retrofit would severely undermine the cost-effectiveness of the CAIR program while leading to potentially unintended consequences such as sharp natural gas price increases.

ACCCE also questions the legality of constraints on emissions trading in light of the decision in *Clean Air Markets Group v. Pataki*, 194 F. Supp. 2d 147, 160 (N.D.N.Y. 2002), *aff'd*, 338 F.3d 82 (2d Cir. 2003). In *Clean Air Markets Group* (*CAMG*), plaintiffs objected to a New York statute seeking to limit the geographic sale of Title IV sulfur dioxide emissions allowances to certain upwind states. Plaintiffs argued that New York's allowance trading restrictions were impermissible under the Clean Air Act and various provisions of the U.S. Constitution, including the Supremacy and Commerce clauses.

The Commerce Clause implications of potential restrictions on the trading of allowances for visibility protection need to be carefully considered by MANE-VU states. Where a state law or regulation is found to be discriminatory, courts will employ strict scrutiny, and the defendant must "show that it advances a legitimate local purpose that cannot be adequately served by reasonable nondiscriminatory alternatives." Notwithstanding the underlying legislative or regulatory purpose, however laudable, a statute or regulation that discriminates against commerce is protectionist and violates the Constitution. If a plaintiff can demonstrate that a regulation discriminates against interstate commerce, the burden of proof shifts to the defendant to demonstrate that there are no other non-discriminatory means to advance a legitimate local interest.

In *CAMG*, the 2d Circuit upheld the district court decision finding that New York's statute was unconstitutional and was preempted by the Clean Air Act. The 2d Circuit summarized the holdings of the lower court before affirming the decision in favor of plaintiffs:

> Because SO2 emissions can travel hundreds of miles in the wind, much of the acid deposition in the Adirondacks results not from SO2 emissions in New York, but, rather, from SO2 emissions in fourteen "upwind" states. These states include New Jersey, Pennsylvania, Maryland, Delaware, Virginia, North Carolina, Tennessee, West Virginia, Ohio, Michigan, Illinois, Kentucky, Indiana, and Wisconsin.
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> In 2000, the New York legislature sought to address this problem by passing the Air Pollution Mitigation Law, N.Y. Pub. Serv. L. § 66-k ("section 66-k"). Pursuant to this statute, the New York State Public Service Commission ("PSC") is required to assess "an air pollution mitigation offset" upon any New York utility whose SO2 allowances are sold or traded to one of the fourteen upwind states. N.Y. Pub. Serv. L. § 66-k(2). The amount assessed is equal to the amount of money received by the New York utility in exchange for the allowances. *Id.* Moreover, the assessment is made regardless of whether the allowances are sold directly to a utility in an upwind state or are subsequently transferred there. *Id.* Accordingly, in order to avoid the assessment, New York utilities must attach a restrictive covenant to any allowances they sell that prohibits their subsequent transfer to any of the fourteen upwind states. *See* N.Y. Pub. Serv. L. § 66-k(3).
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> With respect to preemption, the Court first determined that section 66-k is not expressly preempted by Title IV. *Id.* at 157. Next, it held that Title IV is not "sufficiently comprehensive" to preempt all state law in the field of air pollution control. *Id.* Nevertheless, the District Court concluded that section 66-k was preempted because it "actually conflicts with" Title IV by creating "an obstacle to the accomplishment and execution of the full purposes and objectives of Congress" in passing the Act. *Id.* at 158 (quoting *Hillsborough County, Florida v. Automated Med. Labs., Inc.*, 471 U.S. 707, 713 (1985) (internal quotation marks and citation omitted)). The Court reasoned that "New York's restrictions on transferring allowances to [utilities] in the Upwind States is contrary to the federal provision that allowances be tradeable to *any* other person." *Id.* It also noted that "Congress considered geographically restrict[ing] allowance transfers and rejected it," and that "[t]he EPA, in setting regulations to implement Title IV, also considered geographically restricted allowance trading and rejected it over New York State's objections." *Id.* (citations omitted).
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> The District Court next considered CAMG's alternative argument that section 66-k violates the Commerce Clause of the Constitution. The Court

concluded that section 66-k "is a constitutionally invalid protectionist measure" because "[its] explicit restriction on the transfer of SO2 allowances to [utilities] in Upwind States erects . . . a barrier against the movement of interstate trade." *Id.* at 161; *see also City of Philadelphia v. New Jersey*, 437 U.S. 617, 624 (1978) (holding that "where simple economic protectionism is effected by state legislation, a virtually *per se* rule of invalidity has been erected"). The Court further held that, even if the statute were not merely protectionist, it would still violate the Commerce Clause because "it cannot be 'fairly . . . viewed as a law directed to legitimate local concerns, with effects upon interstate commerce that are only incidental.'" *Hillsborough*, 471 U.S. at 161 (quoting *City of Philadelphia*, 437 U.S. at 624); *see also Pike v. Bruce Church, Inc.*, 397 U.S. 137, 142 (1970) ("Where the statute regulates evenhandedly to effectuate a legitimate local public interest, and its effects on interstate commerce are only incidental, it will be upheld unless the burden imposed on such commerce is clearly excessive in relation to the putative local benefits.").

In light of its conclusion that section 66-k violates the Supremacy Clause and the Commerce Clause of the Constitution, the District Court denied defendants' motions for summary judgment, granted CAMG's cross-motion for summary judgment, and enjoined defendants from enforcing section 66-k. ...

Although section 66-k does not technically limit the authority of New York utilities to transfer their allowances, it clearly interferes with their ability to effectuate such transfers. First, by requiring utilities to forfeit one hundred percent of their proceeds from any allowance sale to a utility in an upwind state, section 66-k effectively bans such sales. Moreover, the only way for New York utilities to ensure that they will not be assessed pursuant to section 66-k is to attach to every allowance they sell a restrictive covenant that prohibits the subsequent transfer of the allowance to an upwind state. Because such a restrictive covenant indisputably decreases the value of the allowances, section 66-k clearly "restrict[s] or interfere[s] with allowance trading," 40 C.F.R.§ 72.72(a). In sum, section 66-k impermissibly "interferes with the *methods* by which [Title IV] was designed to reach [the] goal" of decreasing SO2 emissions, and therefore it "stands as an obstacle" to the execution of Title IV's objectives. *International Paper*, 479 U.S. at 494 (emphasis added).

Defendants argue that, even if section 66-k "stands as an obstacle" to the execution of Title IV's objectives, *see Hillsborough County*, 471 U.S. at 713, it does not "actually conflict" with federal law because it is expressly permitted by two other statutory provisions of the Clean Air Act. First, defendants draw our attention to 42 U.S.C. § 7416, a savings clause that preserves state authority "to

> adopt or enforce (1) any standard or limitation respecting emissions of air pollutants or (2) any requirement respecting control or abatement of air pollution." Defendants argue that section 66-k is a "requirement respecting control or abatement of air pollution," *id.*, that is not preempted because it "simply goes further than the relevant federal law." Pataki Br. at 26. But, as properly noted by the District Court, section 66-k does not set requirements for air pollution control or abatement within New York, but, rather, is an attempt to "control emissions in another state." *CAMG*, 194 F. Supp.2d at 159. Nothing in the language of 42 U.S.C. § 7416 permits such legislation.
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> Defendants also maintain that section 66-k is authorized by 42 U.S.C. §7651b(f), which provides in relevant part that the allowance trading system "shall [not] be construed as requiring a change of any kind in any State law regulating electric utility rates and charges or affecting any State law regarding such State regulation or as limiting State regulation . . . under such a State law." But section 66-k does not regulate "utility rates and charges" and it does not "affect[] any State law regarding" the regulation of "utility rates and charges." Accordingly, 42 U.S.C. §7651b(f) does not save section 66-k from preemption.
>
> In sum, section 66-k is preempted by Title IV of the Clean Air Act Amendments of 1990 because it impedes the execution of "the full purposes and objectives" of Title IV, *see Hillsborough County*, 471 U.S. at 713, and because it is not otherwise authorized by federal law. Accordingly, section 66-k violates the Supremacy Clause of the United States Constitution."

The decision in *CAMG* is a controlling precedent against any proposed restrictions on trading of Title IV/CAIR SO2 allowances for purposes of achieving progress toward visibility protection goals. New York's purposes in restricting allowance sales to certain states to help protect its ecosystems against welfare-related acid deposition are quite similar to state objectives in limiting allowance trading for visibility protection purposes.

<u>Underestimated Emission Reductions</u>

ACCCE believes that the emission projections that NESCAUM relied upon to derive estimates of the reductions potentially associated with its BART and "167 Stack" strategies are inaccurate, and do not properly reflect the extent of reductions likely to occur under CAIR and other federal and state programs by 2018.

Specifically, as other comments will attest, the estimates of emission reductions at 14 BART units do not fully account for all CAIR-related reductions likely to occur at covered EGU facilities by 2018. Similarly, NESCAUM's methodology for estimating the incremental emissions reductions from its "167 Stack" strategy underestimates the degree of controls likely to result from CAIR by 2018, because many of the scrubber installations to be accomplished in this timeframe have not yet been announced, or otherwise are not reflected in the outdated VISTAS IPM 2.1.9 inventory.

Regional Fuels Proposals

NESCAUM also has estimated the potential visibility and health benefits associated with alternative low-sulfur fuels strategies for the Northeast. These controls would reduce sulfur in home heating fuels to levels of 500 ppm (S1) or 15 ppm (S2), resulting in estimated SO2 reductions of 110,000 to 140,000 tons for distillate oil units in the Northeast.[7] Costs per ton reduced are estimated in a range of $500 to $5,000. Most of these emission reductions would occur at residential and commercial oil furnaces.

Most of the PM2.5 air quality benefits resulting from these proposals appear to result from implementation of the 500 ppm standard, with little incremental benefit from the more stringent 15 ppm alternative.[8] These benefits are concentrated in the eastern portion of MANE-VU, where most of the emission reductions would occur.

ACCCE takes no position on the need for these low-sulfur fuel strategies for visibility protection purposes, but notes that they would apply to largely unregulated sources of sulfur dioxide emissions and could produce substantial emissions reductions potentially relevant for other purposes, such as meeting PM2.5 standards. We respectfully suggest that MANE-VU states

[7] Salmi and Kleiman, supra n. 1 at 14.
[8] Id., at 17-18.

give careful consideration to the relative costs and benefits of the S1 and S2 strategies.

ACCCE appreciates the opportunity to submit these comments. Please post them on an appropriate section of the MANE-VU or MARAMA website.

Sincerely,

/s/

Eugene M. Trisko

Attachment

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January 9, 2007

To: Ms. Angela King (MARAMA) via electronic submission
From: Dominion

Re: Comments on MANE-VU Draft Report: *MANE-VU Modeling for Reasonable Progress Goals* (December 10, 2007)

Dear Ms. King:

We have reviewed and appreciate the opportunity to provide comment on the draft report *MANE-VU Modeling for Reasonable Progress Goals* (December 10, 2007) prepared by the Northeast States for Coordinated Air Use Management (NESCAUM). The report identifies a number of control strategies that modeling predicts would yield visibility benefits beyond those that would result from "on the books/on the way" air quality control programs. Included among these measures is the adoption of additional controls for a list of 167 "select" electric generation units (EGU) identified by MANE-VU as "most likely to affect" visibility in certain Class I areas within the MANE-VU region. Several EGU's owned and operated by Dominion are included in this list[1].

Dominion recognizes the importance of achieving acceptable levels of visual air quality in our nation's Class I areas and supports state efforts to achieve the improvement targets established by the uniform glide paths the states have set for each Class I area. These glide paths are generally accepted by EPA as demonstrating achievement of reasonable progress requirements under the EPA regional haze rule. We offer the following observations and comments concerning the NESCAUM report and MANE-VU's "blanket" call for 90% reduction in SO2 emissions from all sources identified in the "select" list of EGU's.

First, the modeling conducted by NESCAUM to predict the impact of "on-the-books" and "on-the-way" controls implemented by the MANE-VU states and states in the neighboring regional planning organizations (RPO's) projects that **all** Class I areas within the MANE-VU region will achieve significant visibility improvements **beyond** the unified glide path by 2018. This means that emission reduction measures already in progress or that will be implemented to meet CAIR and other regulatory requirements are sufficient and in fact **exceed** requirements to demonstrate reasonable progress under EPA's regional haze regulation. We further note that while the MANE-VU analysis accounts for and captures projected visibility improvements from source-specific BART requirements in the Northeast region, it does not include the potential impact of BART-

[1] Specifically, Mt. Storm Units 1-3, Chesterfield Units 4-6, Chesapeake Energy Center Units 3&4, Yorktown Units 1-3, Brayton Point Units 1-3 and Salem Harbor Units 1-3.

specific reductions in the neighboring RPO's that could provide some additional level of visibility improvement in MANE-VU Class I areas.

Second, we question whether MANE-VU is justified in determining from a broad-based perspective that a 90% SO2 reduction for **all** EGU's identified as affecting visibility in the MANE-VU region is reasonable under the reasonable progress provisions of the regional haze rules. The 1999 regional haze rule requires the states to consider the four statutory reasonable progress factors - the costs of compliance, the time necessary for compliance, the energy and non-air quality environmental impacts of compliance, and the remaining useful life of **any** potentially affected sources. While EPA's final guidance on setting reasonable progress goals appears to provide states with some discretion in terms of evaluating the cost of compliance for individual sources or source categories, we believe each individual source should be allowed to evaluate each of the criteria of the four factor analysis. Furthermore, sources already subject to BART are in the process of completing the required BART analysis, which encompasses an assessment of the same factors that must be addressed in establishing reasonable progress. Thus, any source that has already been subject to a BART determination assessment should be exempt from any further requirements. EPA implies this conclusion in its final guidance, observing that it is not necessary for states to reassess the reasonable progress factors for sources subject to BART for which the states have already completed a BART analysis (EPA *Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program*, June 1, 2007, page 5-1).

Third, we wish to point out that Dominion is already implementing an aggressive emission reduction control program across its fossil generation fleets in the mid-Atlantic, New England and Midwest regions. This program includes the very sources identified in the MANE-VU list of 167 "select" EGU's. All three coal-fired units at Dominion's Mt. Storm Power Station in West Virginia are controlled with FGD systems that are achieving well over 90% SO2 removal efficiency. All four units at the Chesterfield facility in central Virginia will be scrubbed by 2011, with the first FGD system scheduled for operation this year. Reductions are also planned for the Chesapeake Energy Center and Yorktown Power Station coal-fired units by 2015. In the New England region, the Brayton Point Power Station has plans to implement comprehensive emission controls to comply with stringent state SO2 regulations. Dominion is also engaged in BART determination analyses with our various states for several of the sources/units identified by MANE-VU.

Finally, MANE-VU attempts to justify its call for 90% SO2 reductions from each of the EGU's identified in its select list on the basis of projected health benefits to address the new PM2.5 daily standard and yet-to-be determined new 8-hour ozone standards in a draft companion report entitled *Public Health Benefits of Reducing Ground-level Ozone and Particle Matter in the Northeast U.S.* (November 14, 2007). While we recognize states will need to address the new PM NAAQS and new levels of the ozone standard (once determined), it is premature at this point to assume that a particular level of emission reduction from a select list of sources across a broad-based region is an appropriate strategy to address these issues. The states are currently in the process of finalizing implementation plans to address the 1997 PM NAAQS and the current 8-hour ozone standard. EPA and the states have not established attainment designations under the revised PM2.5 standards and are not required to submit plans to address the new PM2.5 standard until 2013. With respect to a new 8-hour standard, EPA has not finalized the level of the new standard, and final attainment designations and state implementation plans are still years away. Consequently, states should be provided the time needed to assess the impacts of strategies and programs already in place to address the current standards, and to evaluate and determine the appropriate mix of control strategies that will be needed to address the new standards.

For these reasons, we do not believe that the implementation of a "blanket" control strategy across a select list of sources that are either already taking measures to reduce emissions under CAIR or already undertaking BART analyses is needed to demonstrate reasonable progress. As the MANE-VU modeling analysis clearly shows, existing and planned programs already "on-the-books" and "on-the-way" will achieve progress beyond the requirements identified in the uniform glide paths the states have already set for Class I areas.

Thank you once again for the opportunity to provide comments on this draft report. If you have any questions, please call Lenny Dupuis @ 804-273-3022 or Leonard.dupuis@dom.com.

Sincerely,

Pamela F. Faggert

Pamela F. Faggert

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January 9, 2007

Ms. Angela King
Environmental Planner
MARAMA
8600 LaSalle Road
Suite 636
Towson, MD 21286.

Re: Draft Reports "MANE-VU Modeling for Reasonable Progress Goals" and "Public Health Benefits of Reducing Ground-level Ozone and Fine Particle Matter in the Northeast U.S."

Dear Ms. King:

The Midwest Ozone Group (MOG) has reviewed the two draft reports, titled **"MANE-VU Modeling for Reasonable Progress Goals" and "Public Health Benefits of Reducing Ground-level Ozone and Fine Particle Matter in the Northeast U.S."** As you noted in your notice of opportunity for comment, both reports were prepared by NESCAUM on behalf of MANE-VU, with the reasonable progress report being dated December 10, 2007, and the public health benefits report being dated November 14, 2007. The draft reports are generally well written and informative; however MOG offers the following comments regarding each report:

MANE-VU Modeling for Reasonable Progress Goals

MOG notes that the modeling conducted by NESCAUM to predict the results of controls implemented by the MANE-VU states and states in neighboring RPOs projects that all Class I Areas in MANE-VU will experience visibility by 2018 that is well below the uniform glide slope generally accepted by EPA as demonstrating achievement of reasonable progress requirements under the EPA Regional Haze Rule (64 Fed. Reg. 35714, July 1, 1999). MOG congratulates MANE-VU on this achievement.

The foregoing achievement notwithstanding, the executive summary of the NESCAUM report states at page viii:

> "[a]n assessment of potential control measures that would address this future contribution has identified a number of promising

> strategies that would yield significant visibility benefits beyond the uniform rate of progress and, in fact, significantly beyond the projected visibility conditions that would result from "on the books/on the way" air quality protection programs. These "beyond on the way" measures include the adoption of low sulfur heating oil, implementation of Best Available Retrofit Technology (BART) requirements, and additional electric generating unit (EGU) controls on select sources. The combined benefits of adopting all of these programs could lead to an additional benefit of between 0.38 and 1.1 deciviews at MANE-VU Class I areas on the 20 percent worst visibility days by 2018."

MOG submits that requiring the implementation of control strategies that result in visibility improvement beyond the improvement necessary to meet the uniform glide slope is neither necessary under the Regional Haze Rule nor an efficient use of resources. MOG therefore urges MANE-VU to accept the benefits of on the books control strategies, many of which not yet fully implemented and that result in attainment of reasonable progress as defined by EPA, rather than continue to press for implementation of additional control strategies that are simply unnecessary to comply with the Regional Haze Rule and, more importantly, strain an already unstable national economy.

Public Health Benefits of Reducing Ground-level Ozone and Fine Particle Matter in the Northeast U.S

The executive summary of this NESCAUM report states at page ix:

> The analysis showed that there are significant monetized health benefits in going beyond a revised ozone national ambient air quality standard (NAAQS) of 0.075 ppm, which is the upper end of EPA's range for its proposed ozone NAAQS revision (0.070 ppm – 0.075 ppm). Rolling back to a NAAQS of 0.075 ppm after CAIR+ gave an estimate of 27 to 142 avoided premature deaths over the 2018 ozone season in the OTR. When added to the benefits from avoided morbidity endpoints, we estimated monetary benefits of 192 to 918 million dollars over the 2018 ozone season. By contrast, adopting an ozone NAAQS of 0.070 ppm (i.e., the upper limit of the range recommended by the Clean Air Scientific Advisory Committee (CASAC)) increases the mortality benefits with an estimated 43 to 220 avoided premature deaths in the OTR over the 2018 ozone season. When added to the benefits from avoided morbidity endpoints, we estimate an additional monetary benefit of 107 to 498 million dollars beyond a 0.075 ppm standard (total benefit of 300 million to 1.4 billion dollars after CAIR+). Finally, adopting an ozone NAAQS at the lower end of the CASAC recommended range, 0.060 ppm, results in an increased estimate of 84 to 407 avoided premature deaths in the OTR over

the 2018 ozone season. Compared to the 0.075 ppm scenario, the modeling indicates that a NAAQS set at 0.060 ppm could net almost twice the monetary benefits by providing 394 million dollars to 1.7 billion dollars beyond a 75 ppb standard (total benefit of 530 million to 2.6 billion dollars after CAIR+)

MOG believes that the metrics used by NESCAUM in this study to monetize the health benefits of the ozone NAAQS are outdated and are not representative of the actual economics associated with a revision of the ozone NAAQS. A recent study in the European Union has concluded that excess mortality is simply not an accurate metric based on mortality data in the EU, whereas loss of life expectancy (i.e., reduced life span) is an appropriate metric. See "Interpretation of Air Pollution Mortality: Number of Deaths or Years of Life Lost?," Ari Rabl, Centre d'Energe´ tique, Ecole des Mines de Paris, France, *J. Air & Waste Manage. Assoc.*, 53:41–50, January, 2003. This technical paper examines indicators for the mortality impacts of air pollution, showing that the frequently cited number of deaths is not appropriate, whereas reduced life expectancy is. Specific numbers are calculated, suggesting that a life expectancy gain of approximately four months might be a reasonable goal for the reduction of air pollution in the EU and the United States in the foreseeable future. Notably, the economics associated with loss of life expectancy calculations result in far lower monetary values that might be associated with any reduction in the ozone NAAQS. MOG believes that this research is more indicative of reality and submits that the NESCAUM work using the EPA BenMAP tool presents an unrealistic estimate of the benefits of a reduction in the ozone NAAQS.

MOG appreciates the opportunity to comment on this draft report. If you have any questions or need clarification regarding any of the comments we are providing, please contact me at your convenience.

Very truly yours,

Edward L. Kropp
Midwest ozone Group

Reliant Energy

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January 9, 2008

Email and Overnight Delivery
Ms. Angela King
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Towson, Maryland 21286

Re: Comments on draft MANE-VU report entitled "MANE-VU Modeling for Reasonable Progress Goals"

Dear Ms. King:

Reliant Energy, Inc. and our contractor ENSR Corporation appreciate the opportunity to comment on the draft MANE-VU report entitled "MANE-VU Modeling for Reasonable Progress Goals – Model Performance Evaluation, Pollution Apportionment and Control Measure Benefits" as prepared by Northeast States Coordinated Air Use Management (NESCAUM). Reliant Energy owns and/or operates many power plants in the United States including 18 in the Commonwealth of Pennsylvania and four in the State of New Jersey, and we are dedicated to operating all of our plants in compliance with all applicable environmental regulations and permits. We take seriously our responsibility for environment stewardship and exercise care for the communities that we are members of and serve. Details of Reliant Energy's comments to the aforementioned report are provided in the attached document – our comments can be summarized as follows:

1. Further emission reductions beyond "on-the-book / on-the-way" (OTB/OTW) regulations are unnecessary for achieving the 2018 Regional Haze Rule (RHR) milestones. Before any further emission reductions are mandated, Reliant Energy recommends that U.S. EPA plan a comprehensive assessment of the effects on measured visibility of the first RHR implementation period and a reassessment of model performance at that time.

2. A critical input to the models is the air emissions inventory. There are significant differences in the base year 2002 inventory as prepared by the various stakeholders. There also appears to be implausible estimates of sulfur dioxide (SO_2), nitrogen oxides (NOx) and fine particulate matter (primary $PM_{2.5}$) emissions in the future year's inventories. Reliant Energy welcomes the opportunity to work with MANE-VU and NESCAUM to develop a mutually-agreeable 2002 emissions inventory for our facilities, especially those located in New Jersey, Ohio and Pennsylvania, and to thoroughly

investigate and critically review the assumptions used to develop the future year's inventories. With regards to the future year's inventories, Reliant Energy understands that these do not incorporate recent New Source Review settlements that have specified the installation of control equipment and the permanent retirement of allowances which would be made available through the operation of this emissions control equipment.

3. The results from various future year model runs are presented in the draft report. In several instances, the conclusions deduced by NESCAUM do not appear to be supported by model runs.

I wish to thank-you again for your assistance in locating supporting documents to the subject report. Reliant Energy appreciates your attention to these comments as an important stakeholder in the regulatory process. If you have any questions or comments regarding this submittal, please contact me via telephone or email as listed above.

Very truly yours,

John P. Shimshock

John P. Shimshock
Sr. Air Environmental Specialist

Attachments

Cc: Mr. Robert Paine, ENSR Corporation

Comments on "MANE-VU Modeling for Reasonable Progress Goals – Model Performance Evaluation, Pollution Apportionment, and Control Measure Benefits"

Submitted by Reliant Energy, Inc. and ENSR Corporation

January 9, 2008

Reliant Energy and our contractor ENSR Corporation appreciate this opportunity to comment on a draft MANE-VU report entitled "MANE-VU Modeling for Reasonable Progress Goals" that is dated December 10, 2007 and available at http://filesharing.nescaum.org/download.php?file=31Modeling%20for%20Reasonable%20Progress%2012.10.07.doc. The Northeast States Coordinated Air Use Management (NESCAUM) has prepared the aforementioned draft report for the Mid-Atlantic / Northeast Visibility Union (MANE-VU) Regional Planning Organization (RPO) to assist states in developing strategies to address regional visibility and fine particle ($PM_{2.5}$) issues. Air quality simulations for calendar years 2002 (base year) and several future years (including 2009 and 2018, a Regional Haze Rule [RHR] milestone year) have been performed using the following widely used regional models:

- Community Multi-Scale Air Quality (CMAQ) modeling system
- Regional Modeling System for Aerosols and Deposition (REMSAD)

Reliant Energy's comments can be summarized as follows:

1. Further emission reductions beyond "on-the-book / on-the-way" (OTB/OTW) regulations are unnecessary for achieving the 2018 RHR milestones. Before any further emission reductions are mandated, Reliant Energy recommends that EPA plan a comprehensive assessment of the effects on measured visibility of the first RHR implementation period and a reassessment of model performance at that time.

2. A critical input to the models is the air emissions inventory. There are significant differences in the base year 2002 inventory as prepared by the various stakeholders. There also appears to be implausible estimates of sulfur dioxide (SO_2), nitrogen oxides (NOx) and fine particulate matter (primary $PM_{2.5}$) emissions in the future year's inventories. Reliant Energy welcomes the opportunity to work with MANE-VU and NESCAUM to develop a mutually-agreeable 2002 emissions inventory for our facilities, especially those located in New Jersey, Ohio and Pennsylvania, and to thoroughly investigate and critically review the assumptions used to develop the future year's inventories. With regards to the

future year's inventories, Reliant Energy understands that these do not incorporate recent New Source Review settlements that have specified the installation of control equipment and the permanent retirement of allowances which would be made available through the operation of this emissions control equipment.

3. The results from various future year model runs are presented in the draft report. In several instances, the conclusions deduced by NESCAUM do not appear to be supported by model runs.

4. A general format comments is that the report's pagination is not consistent and some figures are out of place or repeated in Section 2.

Details of Reliant Energy's comments are organized by section and presented below.

Comments on Section 1

Section 1 of the draft MANE-VU report describes the model pre-processing steps involving 2002 meteorological data, emissions preparation, and the modeling platforms. Section 1.3 describes emission scenarios that were modeled. A critical input to the regional models is the emissions inventory. A 2002 base year inventory was developed to assess model performance and to serve as a point of comparison for future year projections in terms of emissions reductions and air quality improvement. For emission sources located within MANE-VU region, the 2002 inventory was prepared by MANE-VU, which relied primarily on U.S. EPA's National Emissions Inventory (NEI). Future year emission inventories for all U.S. states were developed using EPA's Integrated Planning Model (IPM). Projected emission inventories for 2009 and 2018 incorporated "on the books / on the way" (OTB/OTW) emission control regulations. Other projected emission inventories for 2018 were also developed using additional emission control regulations ("beyond on the way" or BOTW) – the BOTW regulations includes the following scenarios:

- Reduced fuel oil sulfur content – maximum 500 ppmw for S-1 fuel oil strategy and maximum 15 ppmw for S-2 fuel oil strategy
- Best Available Retrofit Technology (BART) for 14 BART-eligible facilities located in the MANE-VU region
- "167 EGU Strategy" – 90 percent SO_2 control on 167 electric generating units (EGUs) located throughout the U.S

<u>Comment #1 on Section 1</u> : There are significant differences in the 2002 emissions inventories as prepared by industrial facilities, local regulatory agencies, U.S. EPA and MANE-VU.

Industrial facilities submitted their 2002 emissions inventories to their pertinent regulatory agencies in early 2003. The agencies reviewed and often modified the emission estimates per their internal procedures. The agencies then forwarded the inventories to U.S. EPA, who reviewed and often modified the emission estimates per their internal procedures for ultimate compilation in the National Emissions Inventory (NEI). It is important to note the NEI included estimates of condensable PM emissions (a component of primary $PM_{2.5}$), which were not usually required to be reported by the agencies. Lastly, MANE-VU reviewed and possibly revised the emission estimates reported in the NEI for compilation in their emissions inventory. As such, it is possible that four similar, but different, inventories were generated for the same industrial facility. It is expected that there are significant differences in condensable PM emissions as estimated by the various stakeholders. Reliant Energy welcomes the opportunity to work with MANE-VU and NESCAUM to develop a mutually-agreeable 2002 emissions inventory for our facilities, especially those located in New Jersey, Ohio and Pennsylvania.

Comment #2 on Section 1: A critical review of the 2009 and 2018 projected emissions inventories needs to be performed.

Reliant Energy understands that the projected emissions for calendar years 2009 and 2018 were derived from U.S. EPA's Integrated Planning Model (IPM). Although time constraints prevented Reliant Energy from completing a thorough review of the IPM runs, we understand that the IPM runs were conducted in accordance with the 2002 emissions inventory (which likely overestimates $PM_{2.5}$ emissions from EGUs) and the following model assumptions (reference the telephone conversation between Ms. Julie McDill of MARAMA and Mr. John Shimshock of Reliant Energy on 12-07-2007):

- Activation of new electrical generation from small sources not included in the 2002 inventory – many of these sources were assumed to be fired using renewal fuels (e.g., landfill gases, waste to energy plants
- Fuel switching from natural gas to coal for existing EGUs
- Electrical generation load switching from the Midwest to the East

A comparison of the MANE-VU 2002 inventories with the 2009 and 2018 (OTB/OTW) inventories for SO_2, NOx and primary $PM_{2.5}$ (defined as the sum of filterable $PM_{2.5}$ and condensable PM fractions) for EGUs located in New Jersey, Ohio and Pennsylvania is presented below (copies of the pertinent summaries are provided separately).

Table 1 List of EGU Emission Inventories for 2002, 2009 and 2018

New Jersey EGUs

	SO_2		NOx		Primary $PM_{2.5}$	
Year	(tons)	% change from prior model year	(tons)	% change from prior model year	(tons)	% change from prior model year
2002	51,137		29,416		1286	
2009	27,509	- 46 %	12,066	- 59 %	3259	+ 153 %
2018	32,495	+ 18 %	13,636	+ 13 %	3515	+ 8 %

Ohio EGUs

	SO_2		NOx		Primary $PM_{2.5}$	
Year	(tons)	% change from prior model year	(tons)	% change from prior model year	(tons)	% change from prior model year
2002	Not prepared by MANE-VU					
2009	475,671		109,254		47,712	
2018	215,501	- 55 %	83,129	- 24 %	33,323	- 30 %

Pennsylvania EGUs

	SO_2		NOx		Primary $PM_{2.5}$	
Year	(tons)	% change from prior model year	(tons)	% change from prior model year	(tons)	% change from prior model year
2002	904,609		207,388		7156	
2009	242,071	- 73 %	102,313	- 51 %	32,883	+ 360 %
2018	135,946	- 44 %	82,881	- 19 %	23,756	- 28 %

Reliant Energy asserts that a 153% and a 360% percent increase in $PM_{2.5}$ emissions in 2009 from NJ and PA EGUs, respectively, is absolutely implausible considering that emissions of SO_2 and NOx are predicted to decrease by at least 46 percent. The installation of emission control devices required to achieve the predicted SO_2 and NOx reductions would also lead to co-beneficial $PM_{2.5}$ emission reductions. Consequently, primary $PM_{2.5}$ emissions should show a decrease as do $PM_{2.5}$

precursors. Importantly, the projected $PM_{2.5}$ emission increases, as predicted by the IPM, would have certainly triggered prevention of significant deterioration (PSD) or new source review (NSR) requirements for existing major sources that elected to conduct changes in their methods of operation and for new sources. Additionally, new or modified major sources located in non-attainment areas would be required to obtain emission offsets from that area at a ratio greater than one to one which would cause an overall decrease in emissions. This is especially true for sources located in the Ozone Transport Commission (OTC) region – note that the IPM inexplicably predicts a 13 percent increase in NOx emissions from 2009 to 2018 from EGUs located in New Jersey. Reliant Energy is not aware of any sources or groups of existing sources that would cause an increase in the emissions of the magnitude represented. New sources subject to NSR permitting could not conceivably result in the projected emissions increase. Reliant Energy welcomes the opportunity to work with MANE-VU and NESCAUM to thoroughly investigate and critically review the assumptions used to develop the future year's inventories.

Comments on Section 2

Section 2 of the draft MANE-VU report discusses performance evaluation findings.

Comment #1 on Section 2: Poor modeled meteorological performance during the summer period has significant implications for conclusions regarding source attribution for regional haze impacts.

The meteorological evaluation indicates that the MM5 performance is poorest during summer conditions (June-August), which is a period that corresponds to many of the worst-case regional haze days (as noted from a review of the IMPROVE data from the web site at http://vista.cira.colostate.edu/views/). Therefore, attribution of targeted emission sources that may contribute to the worst 20% days (many of which occur in summer; for example, see Figure 1) is uncertain due to the poor modeled meteorological performance (particularly with regards to the trajectory analysis). It should also be noted that the modeled meteorological performance was poorest for the southern U.S. and interior portions of the U.S. East Coast (NESCAUM states) as compared with other areas included in the model domain. This may have consequences for the accuracy of the efficacy of the BOTW regulations that are advocated by the NESCAUM report.

Figure 1 Composition Plot of Regional Haze at Lye Brook Wilderness Area, 2005

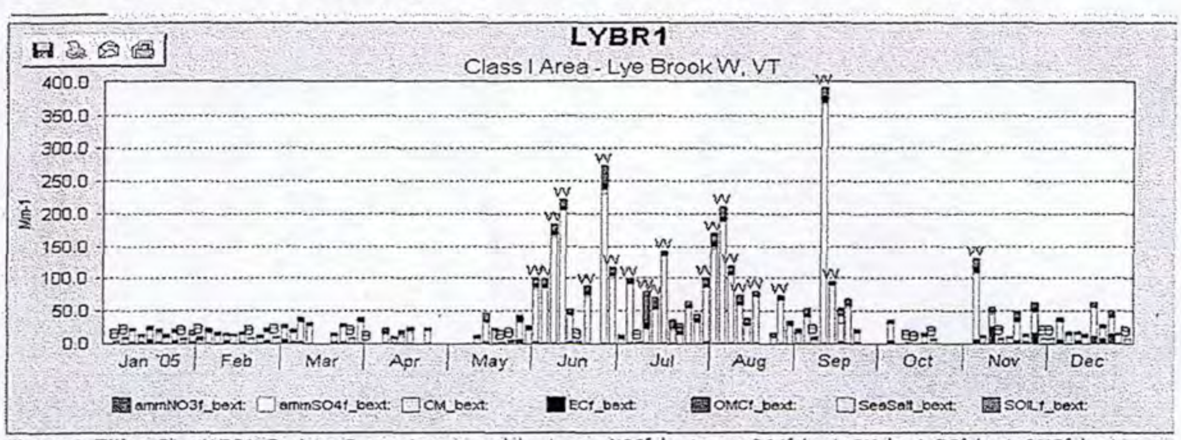


Figure 1. Title - Site: LYBR1. **Series** - Parameter: aerosol_bext, ammNO3f_bext, ammSO4f_bext, CM_bext, ECf_bext, OMCf_bext, SeaSalt_bext, SOILf_bext. **Metadata** - Program: IRHR2, Method: RHR Dataset, Poc: 1, Aggregation: Not aggregated

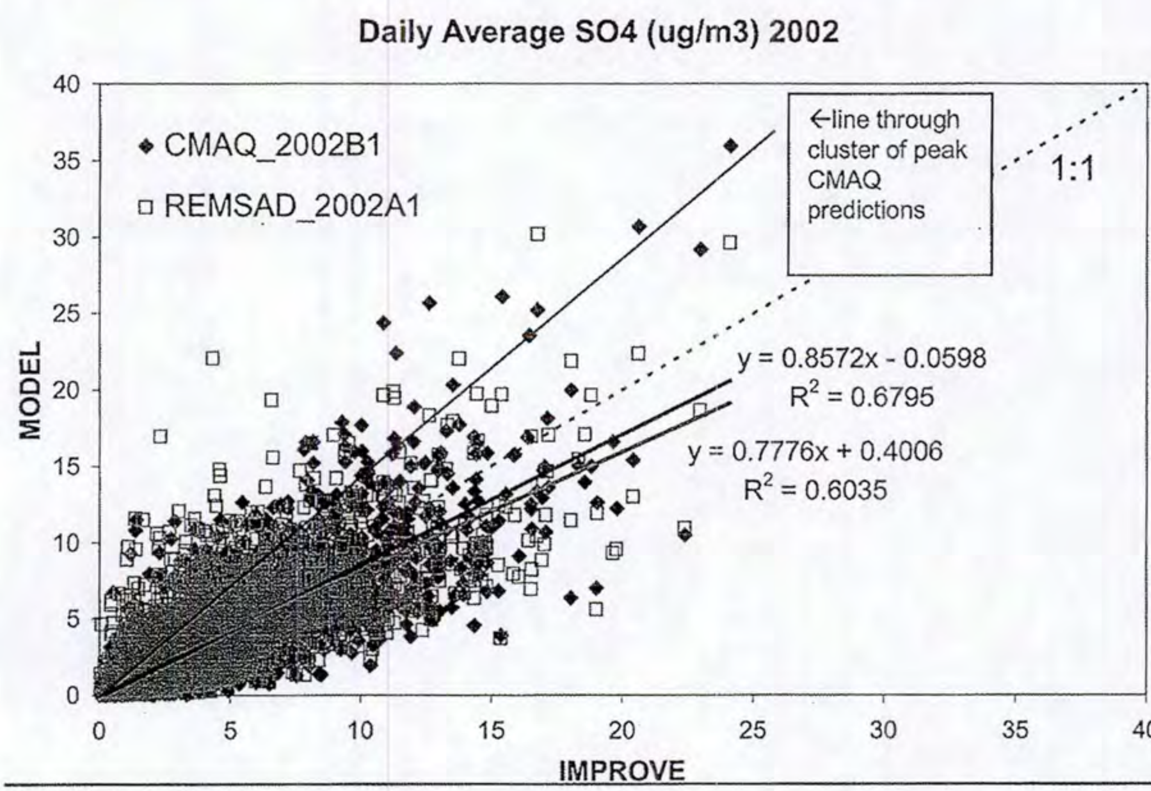
Comment #2 on Section 2: There are several areas of less than acceptable wind speed and direction correlation between modeling and measurements, especially during summer months.

Page 2-24 of the document describes quarterly correlation coefficients in the range of 0.5-0.7 as being "acceptable." Correlation coefficients below 0.5 are not described, but can be presumed to be "less than acceptable". A review of Figures 2-3 and 2-4 shows several areas of grey squares associated with these poor performances. As noted above, poor modeled meteorological performance yields uncertainty with regards to the trajectory analysis and attribution of targeted emission sources that may contribute to the worst 20% days. Reliant Energy requests NESCAUM to address the confidence of the transport of emissions through these areas, especially with regards to emissions from the EGUs included in the "167 EGU Strategy" list.

Comment #3 on Section 2: The regression lines and slopes attributed to the model performance plots do not match the peak prediction areas in some cases.

Some of the figures presented in the report (components of Figure 2-11 and Figure 2-16) have best fit lines drawn in the figures that do not appear to match the line one would eyeball that would pass through the peak values. Since the peak values are most important in determining the trend of the worst 20% regional haze days, it makes sense to reconsider the best-fit lines for this purpose. For example, Figure 2 shows the sulfate particulate predictions vs. observations from the report's Figure 2-11. The blue best fit line far from the area of peak predictions, which are better matched by an alternative line added to Figure 2.

Figure 2 $PM_{2.5}$ Sulfate Performance Plot from Draft MANE-VU Report



Similar eyeballed best-fit lines through the peak CMAQ predictions are added to Figures 3 and 4. These alternative slopes lead to conclusions that the CMAQ model's peak predictions are too high (i.e., the model is over-responding, especially on the worst 20% regional haze days), and can result in a conclusion that certain emission components have an exaggerated effect on visibility.

Figure 3 $PM_{2.5}$ Elemental Carbon Performance Plot from Draft MANE-VU Report

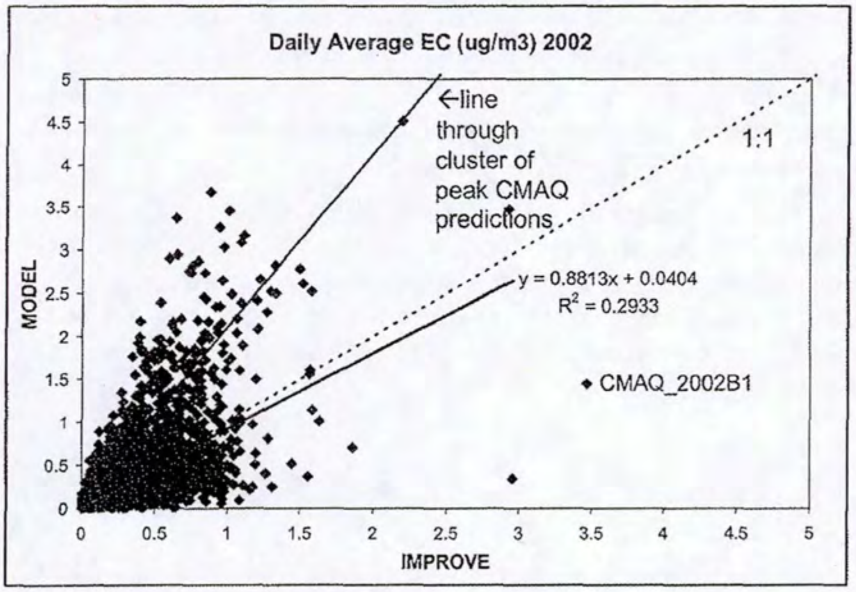
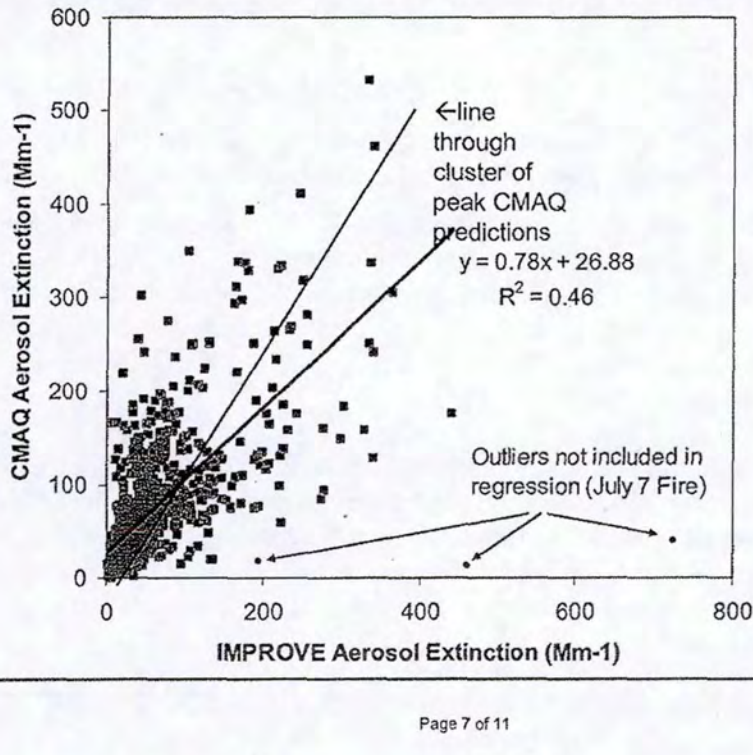


Figure 4 Paired Comparison of Extinction Coefficient Plot from Draft MANE-VU Report



Comments on Section 3

The report shows projected improvement in visibility for the BOTW-1 emission scenario at several Northeastern and Mid-Atlantic sites in Figures 3-1 and 3-2 of the report. The report also shows the projected improvement in visibility for the OTB/OTW scenario in Figures 5-6 through 5-13, and these figures indicate that the visibility improvement by the year 2018 is in excess of the uniform rate of progress "glidepath."

Comment #1 on Section 3: Further emission reductions beyond OTB/OTW are unnecessary for achieving the 2018 RHR milestones. Before any further emission reductions are mandated, a review of the actual visibility improvements attained and the performance of the prediction models needs to be conducted based upon the OTB/OTW emission reductions.

The visibility improvement by 2018 represents the results of substantial SO_2 and NOx (and co-beneficial $PM_{2.5}$) emission control strategies targeted toward EGUs. As noted previously, reductions in $PM_{2.5}$ precursor emissions should also result in a decrease in primary $PM_{2.5}$ emissions. U.S. EPA and other regional analyses have shown that control strategies targeted to reduce SO_2 and NO_x emissions are most effective at reducing $PM_{2.5}$. These OTB/OTW emission control strategies include the following:

- Clean Air Interstate Rule (CAIR)
  - CAIR Phase I NOx reductions in 2009 with both ozone season and non-ozone season budgets
  - CAIR Phase I SO_2 reductions from 2002 budget by 50% in 2010 through 2:1 allowance surrender ratio
  - CAIR Phase II NOx reduced in 2015
  - CAIR Phase II SO_2 reduced from 2002 budget by 65% in 2015 through 2.86:1 allowance surrender ratio
- NOx SIP Call – Effective in 2003, built upon the progress achieved by OTC
- Clean Air Mercury Rule (CAMR) and the more stringent state specific Mercury (Hg) Rules – Phase I Hg reductions begin in 2010, Phase II Hg reductions begin in 2015
- NSR settlements and state programs – The various NSR settlements have specified the installation of control equipment and the permanent retirement of allowances which would be made available through the operation of this emissions control equipment. Additionally, there are state programs, such as North Carolina's "Clean Smokestacks" program that require the surrender of allowances made available due to the installation of control equipment which are part of a rate base.

Due to the large model uncertainties and biases shown in Section 2 of the draft NESCAUM report, inevitable improvements in emission control equipment over the next few years, and the need re-evaluate future regional models with better meteorological databases <u>after</u> the initial visibility improvements are in place, Reliant Energy recommends that EPA plan a comprehensive assessment of the effects on measured visibility of the first RHR implementation period and a reassessment of model performance at that time. This periodic evaluation is required under the RHR – please reference 40 CFR 51.306 as summarized below:

§ 51.306 - Long-term strategy requirements for reasonably attributable visibility impairment

(a)(1) For the purposes of addressing reasonably attributable visibility impairment, each plan must include a long-term (10–15 years) strategy for making reasonable progress toward the national goal specified in § 51.300(a).

(c) The plan must provide for periodic review and revision, as appropriate, of the long-term strategy for addressing reasonably attributable visibility impairment.

(e) The State must consider, at a minimum, the following factors during the development of its long-term strategy:

(1) Emission reductions due to ongoing air pollution control programs,
(2) Additional emission limitations and schedules for compliance,

<u>Comment #2 on Section 3</u>: The issue of how natural background is determined for the PSD Class I areas should be re-evaluated.

The draft NESCAUM report indicates that ammonium sulfate is identified as the largest contributor to haze at MANE-VU Class I areas. Virtually all ammonium sulfate is apparently assumed to be the result of man-made emissions. However, the contribution of natural biogenic sources of ammonia, organic carbon and sulfates may not be properly considered in the determination of naturally-occurring background visibility. Natural decay of the abundant vegetation in saltwater marshes such as those at Brigantine can release significant quantities of ammonia as a result of the reducing environment and the anaerobic biodegradation that takes place in the soils and marine sediments. Likewise, sulfates are released in large quantities from both sea water (where sulfate ions comprise 7.7 wt% of the total salts present in all seawater) and from phytoplankton that release large amounts of sulfates to the atmosphere. These and other related components of natural background should be properly accounted for and represented before any further RHR milestone assessments are attempted.

<u>Comments on Section 4</u>

Section 4 discusses 2002 vs. 2018 apportionment of source area contributions to regional haze.

<u>Comment #1 on Section 4</u>: Results from both CMAQ and REMSAD are shown, but there is little discussion regarding the consistency of these modeling results.

<u>Comment #2 on Section 4</u>: An important "region" for Acadia especially is "SE_BC", but the meaning of this term and others in the figures needs more explanation.

<u>Comments on Section 5</u>

This section presents an evaluation of the effects of various control strategies, as noted above.

<u>Comment #1 on Section 5</u>: There may be double-counting of benefits with the "167 EGU Strategy"

The OTB/OTW emissions scenario <u>should</u> include CAIR SO_2 and NO_x reductions for large EGUs in CAIR states. The CAIR states include multiple states upwind of the MANE-VU region. The discussion does not present sufficient details about the specific controls in items 1 and 5 listed in Section 1.3.5 of the draft report to determine whether item 5 double counts controls already accounted for in CAIR (i.e., several of the EGUs identified in the 167 EGU strategy have elected to install SO_2 and NOx emission control devices in response to Phase I CAIR) . We suspect that this is the case, and if so, the benefits claimed for the "167 Stack Strategy" are overestimated.

<u>Comment #2 on Section 5</u>: All of the control strategies tested result in insignificant changes in $PM_{2.5}$ concentrations, even though the report mentions that the 167 EGU emission reductions will result in "significant reductions."

NESCAUM has suggested that 24-hour average $PM_{2.5}$ concentrations less than 0.13 and 2.0 $\mu g/m^3$ for Class I and Class II areas, respectively, should be considered as "insignificant" per permitting of new sources (see <u>http://www.nescaum.org/topics/permit-modeling</u>). This means that emission changes that result in changes in daily average $PM_{2.5}$ concentrations less than 2.0 $\mu g/m^3$ in Class II areas provide insignificant changes. All of the figures in Section 5 of the MANE-VU draft report show changes in $PM_{2.5}$ concentrations that are less than 2.0 $\mu g/m^3$. Additionally, the projected changes are less than 0.15 $\mu g/m^3$ in most cases and areas in the NESCAUM states. As noted in other comments, the modeled effectiveness of the 167 EGU strategy is likely to be overstated because of double-counting of CAIR emission reductions and also because the CMAQ model overpredicts peak visibility impacts.

<u>Comment #3 on Section 5</u>: The projected rates of visibility improvement do not appear to account for SO_2 and NOx emission reductions required under Phase II CAIR.

The NESCAUM report includes multiple summaries that present the projected rates of visibility improvement at selected Class I areas (please reference Figures 5-6 through 5-14). In all summaries, the projected rate of visibility improvement for the 2002 through 2009 time period, which apparently accounts for the OTB/OTW emission control strategies, exceeds the target uniform rate of visibility improvement (i.e., there is a steeper slope of visibility improvement). However, for the 2009 through 2018 time period, there is a significant retarding in the rate of visibility improvement (i.e., the slope of the line decreases, at some Class I areas the slope is less than the uniform rate). It appears that the model runs do not account for the decreases in SO_2 and NOx (and co-beneficial $PM_{2.5}$) emissions required under <u>Phase II CAIR</u> (begins January 1, 2015). In their support of the CAIR regulations, U.S. EPA has projected a decrease in the number and severity of ozone and $PM_{2.5}$ non-attainment areas in 2015 as compared with 2010 (please see the summary presented in the following link: <u>http://www.epa.gov/cair/charts_files/nonattain_maps.pdf</u>). Nearly all of these emission reductions are projected to occur in states located immediately upwind of the MANE-VU region. Reliant Energy requests NESCAUM to provide a detailed explanation regarding these model runs.

Comment #4 on Section 5: For the "167 EGU Strategy", there are apparent inconsistencies between the average change in 24-hour $PM_{2.5}$ concentrations and projected visibility improvement at selected Class I areas located in the northern NESCAUM states.

NESCAUM conducted a model run in which incorporated a 90 percent control of SO_2 emissions from 167 target EGUs. One-half (83 of 167) of the 167 target EGUs are located in the upwind Ohio River Valley states (Indiana, Kentucky, Ohio, Pennsylvania and West Virginia). The results of the 2018 model run, which are presented in Figure 5-5 of the NESCAUM report, show that the largest change in average 24-hour $PM_{2.5}$ concentrations are projected to occur in those Ohio River Valley States. Ambient air monitoring data collected under U.S. EPA's Clean Air Status and Trends Network (CASTNET) appears to support these model results – ambient air concentrations of SO_2 and particulate sulfate are higher in these areas as compared with the NESCAUM states (please reference the 2005 CASTNET annual report presented in the following link: http://www.epa.gov/castnet/library/annual05/annual_report_2005.pdf). However, although the model results as presented in Figure 5-5 show little or no change in average 24-hour $PM_{2.5}$ concentrations in the northern NESCAUM states and New Brunswick - Canada, the visibility improvement at some selected Class I areas, such as Acadia National Park, is projected to be large (~ 0.5 deciview change) and comparable to that in more southern areas such as Brigantine National Wildlife Refuge – see Figures 5-6 and 5-7. Reliant Energy requests NESCAUM to provide a detailed explanation regarding these apparently inconsistent modeling results.

Comment #5 on Section 5: The NESCAUM report should note that the U.S. EPA has determined that CAIR satisfies the BART requirements for SO_2 and NO_x.

The Pennsylvania Department of Environmental Protection (PA DEP) identified five Reliant Energy facilities located in Pennsylvania that were considered to be BART-eligible. The PA DEP agrees with U.S. EPA that participation in the CAIR trading program satisfies the SO_2 and NO_x BART requirements for Pennsylvania EGUs. With regards to PM_{10} emissions from Reliant Energy's BART-eligible facilities, the PA DEP agrees with our conclusion that additional emissions controls for PM_{10} are not warranted considering the insignificant impacts these sources have on visibility in Class I areas. PA DEP is a participating member of MANE-VU and MARAMA.

Comment #6 on Section 5: There are insufficient details regarding the modeling runs, such as those conducted under a reduced sulfur fuel content control strategy.

The NESCAUM report does not provide details regarding the number and location of sources potentially impacted by an emissions control strategy that limits fuel oil sulfur content to a maximum of 500 parts per million by mass. (In general, the details of emissions inputs to all of the modeling runs described in the report need to be made available to the public.) The results of the 2018 model run, as presented in Figures 5-1 and 5-2, show the largest change in average 24-hour $PM_{2.5}$ concentrations are projected to occur in Delaware and coastal New England, while other populated areas inexplicably show much lower impacts. In the absence of details regarding the number and location of sources potentially impacted by this strategy, it is impossible to gauge the plausibility of the modeled results. As such, Reliant Energy requests NESCAUM to provide a detailed explanation regarding these puzzling modeling results.

2002 MANE-VU Emissions Inventory Summary for PM25 Emissions – New Jersey

Source Category	SCC	Source Type	ANNUAL	
			Emissions (tons/year)	Percent of Total
Stationary Source Fuel Combustion-Residential	2104	Area	11,088	35
Paved Roads	2294	Area	2,570	8
Off-highway Vehicle Diesel	2270	Nonroad	2,376	8
Industrial Processes-Food and Kindred Products: SIC 20	2302	Area	2,226	7
Miscellaneous Area Sources-Other Combustion	2810	Area	1,367	4
External Combustion Boilers-Electric Generation	1010	Point	1,286	4
Highway Vehicles-Gasoline	2201	Onroad	1,264	4
Highway Vehicles-Diesel	2230	Onroad	1,205	4
Off-highway Vehicle Gasoline, 2-Stroke	2260	Nonroad	781	2
Stationary Source Fuel Combustion-Commercial/Institutional	2103	Area	773	2
Marine Vessels, Commercial	2280	Nonroad	732	2
Industrial Processes-Miscellaneous Manufacturing Industries	399	Point	709	2
Pleasure Craft	2282	Nonroad	604	2
Industrial Processes-Mineral Products	305	Point	518	2
Internal Combustion Engines-Electric Generation	2010	Point	476	2
Mobile Sources-Unpaved Roads	2296	Area	428	1
Industrial Processes-Mining and Quarrying: SIC 14	2325	Area	413	1
Top Categories			28,817	90.0
Total PM25-PRI Emissions			**31,595**	**100**

2002 MANE-VU Emissions Inventory Summary for SO2 Emissions – New Jersey

Source Category	SCC	Source Type	ANNUAL	
			Emissions (tons/year)	Percent of Total
External Combustion Boilers-Electric Generation	1010	Point	51,137	56
Marine Vessels, Commercial	2280	Nonroad	11,444	13
Stationary Source Fuel Combustion-Residential	2104	Area	6,901	8
Industrial Processes-Petroleum Industry	306	Point	4,281	5
Stationary Source Fuel Combustion-Commercial/Institutional	2103	Area	3,348	4
Off-highway Vehicle Diesel	2270	Nonroad	3,198	4
Highway Vehicles-Gasoline	2201	Onroad	2,759	3
Industrial Processes-Chemical Manufacturing	301	Point	1,864	2
External Combustion Boilers-Industrial	1020	Point	1,137	1
Top Categories			86,069	96.0
Total SO2 Emissions			**91,295**	**100**

2002 MANE-VU Emissions Inventory Summary for NOx Emissions – New Jersey

Source Category	SCC	Source Type	ANNUAL	
			Emissions (tons/year)	Percent of Total
Highway Vehicles-Gasoline	2201	Onroad	111,610	38
Highway Vehicles-Diesel	2230	Onroad	40,466	14
External Combustion Boilers-Electric Generation	1010	Point	29,416	10
Off-highway Vehicle Diesel	2270	Nonroad	25,558	9
Stationary Source Fuel Combustion-Residential	2104	Area	15,685	5
Marine Vessels, Commercial	2280	Nonroad	10,981	4
Stationary Source Fuel Combustion-Commercial/Institutional	2103	Area	9,232	3
LPG	2267	Nonroad	6,920	2
Off-highway Vehicle Gasoline, 4-Stroke	2265	Nonroad	6,705	2
Railroad Equipment	2285	Nonroad	5,721	2
Internal Combustion Engines-Electric Generation	2010	Point	5,211	2
Top Categories			267,504	91.0
Total NOx Emissions			**293,840**	**100**

NJ

StateLevelSummaryM02.xls -- Emissions, 08/04/05

FIPS State	Pollutant Code	Start Date	End Date	"NIF" Emissions	"NoNIF" Emissions	Total Emissions	Emission Unit
34	CO	20090101	20091231	3,645.28	1,828.07	5,473.35	TON
34	CO	20090501	20090930	1,535.00	627.94	2,162.94	TON
34	CO	20090721	20090721	14.42	6.33	20.75	TON
34	CO	20091001	20090430	2,110.23	1,200.07	3,310.30	TON
34	NH3	20090101	20091231	254.18	142.97	397.15	TON
34	NH3	20090501	20090930	106.47	49.06	155.53	TON
34	NH3	20090721	20090721	0.99	0.48	1.47	TON
34	NH3	20091001	20090430	147.68	93.87	241.55	TON
34	NOX	20090101	20091231	11,284.63	781.71	12,066.34	TON
34	NOX	20090501	20090930	4,921.94	308.40	5,230.34	TON
34	NOX	20090721	20090721	43.05	3.13	46.18	TON
34	NOX	20091001	20090430	6,362.75	473.35	6,836.10	TON
34	PM10-PRI	20090101	20091231	3,610.96	147.16	3,758.12	TON
34	PM10-PRI	20090501	20090930	1,546.78	50.59	1,597.37	TON
34	PM10-PRI	20090721	20090721	13.20	0.53	13.73	TON
34	PM10-PRI	20091001	20090430	2,064.17	96.58	2,160.75	TON
34	PM25-PRI	20090101	20091231	3,112.21	147.16	3,259.37	TON
34	PM25-PRI	20090501	20090930	1,326.96	50.59	1,377.55	TON
34	PM25-PRI	20090721	20090721	11.34	0.53	11.87	TON
34	PM25-PRI	20091001	20090430	1,785.24	96.58	1,881.82	TON
34	SO2	20090101	20091231	27,509.10	0.00	27,509.10	TON
34	SO2	20090501	20090930	11,819.89	0.00	11,819.89	TON
34	SO2	20090721	20090721	100.27	0.00	100.27	TON
34	SO2	20091001	20090430	15,689.22	0.00	15,689.22	TON
34	VOC	20090101	20091231	248.42	46.78	295.20	TON
34	VOC	20090501	20090930	106.91	16.07	122.98	TON
34	VOC	20090721	20090721	0.90	0.13	1.03	TON
34	VOC	20091001	20090430	141.48	30.73	172.21	TON

N√

StateLevelSummaryM01.xls -- Emissions, 07/29/05

FIPS State	Pollutant Code	Start Date	End Date	"NIF" Emissions	"NoNIF" Emissions	Total Emissions	Emission Unit
34	CO	20180101	20181231	4,790.82	2,820.34	7,611.16	TON
34	CO	20180501	20180930	2,332.89	1,278.44	3,611.33	TON
34	CO	20180721	20180721	22.63	12.83	35.46	TON
34	CO	20181001	20180430	2,457.91	1,541.99	3,999.90	TON
34	NH3	20180101	20181231	343.43	220.59	564.02	TON
34	NH3	20180501	20180930	168.61	99.98	268.59	TON
34	NH3	20180721	20180721	1.59	0.97	2.56	TON
34	NH3	20181001	20180430	174.86	120.59	295.45	TON
34	NOX	20180101	20181231	12,438.77	1,197.46	13,636.23	TON
34	NOX	20180501	20180930	5,833.00	598.67	6,431.67	TON
34	NOX	20180721	20180721	52.41	6.06	58.47	TON
34	NOX	20181001	20180430	6,605.74	598.77	7,204.51	TON
34	PM10-PRI	20180101	20181231	3,789.59	227.03	4,016.62	TON
34	PM10-PRI	20180501	20180930	1,694.58	102.92	1,797.50	TON
34	PM10-PRI	20180721	20180721	14.51	0.97	15.48	TON
34	PM10-PRI	20181001	20180430	2,095.02	124.12	2,219.14	TON
34	PM25-PRI	20180101	20181231	3,288.30	227.03	3,515.33	TON
34	PM25-PRI	20180501	20180930	1,472.67	102.92	1,575.59	TON
34	PM25-PRI	20180721	20180721	12.62	0.97	13.59	TON
34	PM25-PRI	20181001	20180430	1,815.63	124.12	1,939.75	TON
34	SO2	20180101	20181231	32,495.10	0.00	32,495.10	TON
34	SO2	20180501	20180930	14,384.13	0.00	14,384.13	TON
34	SO2	20180721	20180721	122.06	0.00	122.06	TON
34	SO2	20181001	20180430	18,110.97	0.00	18,110.97	TON
34	VOC	20180101	20181231	279.79	72.21	352.00	TON
34	VOC	20180501	20180930	129.28	32.70	161.98	TON
34	VOC	20180721	20180721	1.06	0.32	1.38	TON
34	VOC	20181001	20180430	150.52	39.52	190.04	TON

StateLevelSummaryM02.xls -- Emissions, 08/04/05

OH

FIPS State	Pollutant Code	Start Date	End Date	"NIF" Emissions	"NoNIF" Emissions	Total Emissions	Emission Unit
39	CO	20090101	20091231	11,400.84	8,837.55	20,238.39	TON
39	CO	20090501	20090930	4,901.06	3,784.63	8,685.69	TON
39	CO	20090721	20090721	33.98	39.56	73.54	TON
39	CO	20091001	20090430	6,499.81	5,053.21	11,553.02	TON
39	NH3	20090101	20091231	684.50	590.35	1,274.85	TON
39	NH3	20090501	20090930	294.24	252.76	547.00	TON
39	NH3	20090721	20090721	2.00	2.73	4.73	TON
39	NH3	20091001	20090430	390.11	337.06	727.17	TON
39	NOX	20090101	20091231	71,741.01	37,512.63	109,253.64	TON
39	NOX	20090501	20090930	29,583.42	14,955.58	44,539.00	TON
39	NOX	20090721	20090721	204.67	106.96	311.63	TON
39	NOX	20091001	20090430	42,157.56	22,557.09	64,714.65	TON
39	PM10-PRI	20090101	20091231	36,927.57	20,711.16	57,638.73	TON
39	PM10-PRI	20090501	20090930	15,627.65	8,426.39	24,054.04	TON
39	PM10-PRI	20090721	20090721	108.06	59.34	167.40	TON
39	PM10-PRI	20091001	20090430	21,299.81	12,284.12	33,583.93	TON
39	PM25-PRI	20090101	20091231	30,083.47	17,628.39	47,711.86	TON
39	PM25-PRI	20090501	20090930	12,668.16	7,116.04	19,784.20	TON
39	PM25-PRI	20090721	20090721	87.61	50.28	137.89	TON
39	PM25-PRI	20091001	20090430	17,415.21	10,511.68	27,926.89	TON
39	SO2	20090101	20091231	312,348.12	163,322.62	475,670.74	TON
39	SO2	20090501	20090930	130,313.71	66,581.17	196,894.88	TON
39	SO2	20090721	20090721	901.38	460.56	1,361.94	TON
39	SO2	20091001	20090430	182,034.41	96,741.46	278,775.87	TON
39	VOC	20090101	20091231	1,354.34	768.67	2,123.01	TON
39	VOC	20090501	20090930	580.92	326.73	907.65	TON
39	VOC	20090721	20090721	3.98	2.56	6.54	TON
39	VOC	20091001	20090430	773.43	441.88	1,215.31	TON

State Level Summary of Annual, Summary and Winter Season, and July Day Emissions for Scenario #M01

StateLevelSummaryM01.xls -- Emissions, 07/29/05

OH

FIPS State	Pollutant Code	Start Date	End Date	"NIF" Emissions	"NoNIF" Emissions	Total Emissions	Emission Unit
39	CO	20180101	20181231	12,252.98	11,579.25	23,832.23	TON
39	CO	20180501	20180930	5,379.33	4,664.14	10,043.47	TON
39	CO	20180721	20180721	37.39	49.29	86.68	TON
39	CO	20181001	20180430	6,873.68	6,915.23	13,788.91	TON
39	NH3	20180101	20181231	860.00	912.50	1,772.50	TON
39	NH3	20180501	20180930	375.50	366.22	741.72	TON
39	NH3	20180721	20180721	2.58	3.79	6.37	TON
39	NH3	20181001	20180430	484.31	545.74	1,030.05	TON
39	NOX	20180101	20181231	51,597.98	31,531.21	83,129.19	TON
39	NOX	20180501	20180930	22,349.70	13,538.08	35,887.78	TON
39	NOX	20180721	20180721	154.74	98.92	253.66	TON
39	NOX	20181001	20180430	29,248.28	17,993.20	47,241.48	TON
39	PM10-PRI	20180101	20181231	27,405.02	15,349.01	42,754.03	TON
39	PM10-PRI	20180501	20180930	11,982.87	6,676.27	18,659.14	TON
39	PM10-PRI	20180721	20180721	82.83	47.41	130.24	TON
39	PM10-PRI	20181001	20180430	15,422.08	8,672.27	24,094.35	TON
39	PM25-PRI	20180101	20181231	20,794.14	12,528.73	33,322.87	TON
39	PM25-PRI	20180501	20180930	9,072.77	5,433.37	14,506.14	TON
39	PM25-PRI	20180721	20180721	62.72	38.85	101.57	TON
39	PM25-PRI	20181001	20180430	11,721.25	7,094.94	18,816.19	TON
39	SO2	20180101	20181231	135,078.02	80,423.05	215,501.07	TON
39	SO2	20180501	20180930	58,398.14	34,993.39	93,391.53	TON
39	SO2	20180721	20180721	403.97	242.07	646.04	TON
39	SO2	20181001	20180430	76,679.93	45,429.68	122,109.61	TON
39	VOC	20180101	20181231	1,401.50	852.64	2,254.14	TON
39	VOC	20180501	20180930	615.83	363.11	978.94	TON
39	VOC	20180721	20180721	4.21	2.82	7.03	TON
39	VOC	20181001	20180430	785.71	489.32	1,275.03	TON

2002 MANE-VU Emissions Inventory Summary for PM25-PRI Emissions – Pennsylvania

Source Category	SCC	Source Type	ANNUAL	
			Emissions (tons/year)	Percent of Total
Stationary Source Fuel Combustion-Residential	2104	Area	14,034	13
Mobile Sources-Paved Roads	2294	Area	12,478	11
Miscellaneous Area Sources-Agricultural Production-Crops	2801	Area	10,074	9
Open Burning-Waste Disposal, Treatment, and Recovery	261	Area	9,505	9
Mobile Sources-Unpaved Roads	2296	Area	8,317	8
Industrial Processes-Construction: SIC 15-17	2311	Area	7,695	7
External Combustion Boilers-Electric Generation	1010	Point	7,156	7
Industrial Processes-Mineral Products	305	Point	3,990	4
Off-highway Vehicle Diesel	2270	Nonroad	3,792	3
Highway Vehicles-Diesel	2230	Onroad	3,474	3
Industrial Processes-Mining and Quarrying: SIC 14	2325	Area	3,201	3
Industrial Processes-Food and Kindred Products: SIC 20	2302	Area	3,045	3
Stationary Source Fuel Combustion-Commercial/Institutional	2103	Area	2,829	3
External Combustion Boilers-Industrial	1020	Point	2,108	2
Top Categories			91,698	85.0
Total PM25-PRI Emissions			**108,812**	**100**

2002 MANE-VU Emissions Inventory Summary for SO2 Emissions – Pennsylvania

Source Category	SCC	Source Type	ANNUAL	
			Emissions (tons/year)	Percent of Total
External Combustion Boilers-Electric Generation	1010	Point	904,609	84
External Combustion Boilers-Industrial	1020	Point	39,296	4
Stationary Source Fuel Combustion-Residential	2104	Area	30,333	3
Industrial Processes-Mineral Products	305	Point	21,907	2
Stationary Source Fuel Combustion-Commercial/Institutional	2103	Area	19,235	2
Top Categories			1,015,381	95.0
Total SO2 Emissions			1,077,693	100

2002 MANE-VU Emissions Inventory Summary for NOx Emissions – Pennsylvania

Source Category	SCC	Source Type	ANNUAL	
			Emissions (tons/year)	Percent of Total
External Combustion Boilers-Electric Generation	1010	Point	207,388	26
Highway Vehicles-Gasoline	2201	Onroad	181,610	23
Highway Vehicles-Diesel	2230	Onroad	164,861	21
Off-highway Vehicle Diesel	2270	Nonroad	39,321	5
Industrial Processes-Mineral Products	305	Point	32,817	4
Railroad Equipment	2285	Nonroad	29,292	4
Stationary Source Fuel Combustion-Residential	2104	Area	22,495	3
External Combustion Boilers-Industrial	1020	Point	17,830	2
Stationary Source Fuel Combustion-Commercial/Institutional	2103	Area	14,169	2
LPG	2267	Nonroad	12,893	2
Top Categories			722,676	92.0
Total NOx Emissions			795,266	100

State Level Summary of Annual, Summary and Winter Season,
and Summer Day Emissions for Scenario #M02

StateLevelSummaryM02.xls -- Emissions, 08/04/05

FIPS State	Pollutant Code	Start Date	End Date	"NIF" Emissions	"NoNIF" Emissions	Total Emissions	Emission Unit
42	CO	20090101	20091231	33,781.33	6,688.89	40,470.22	TON
42	CO	20090501	20090930	14,282.02	2,844.84	17,126.86	TON
42	CO	20090721	20090721	103.15	20.82	123.97	TON
42	CO	20091001	20090430	19,499.32	3,844.04	23,343.36	TON
42	NH3	20090101	20091231	915.29	732.76	1,648.05	TON
42	NH3	20090501	20090930	393.31	311.87	705.18	TON
42	NH3	20090721	20090721	2.81	1.20	4.01	TON
42	NH3	20091001	20090430	522.01	420.90	942.91	TON
42	NOX	20090101	20091231	89,296.30	13,016.72	102,313.02	TON
42	NOX	20090501	20090930	38,053.12	5,657.07	43,710.19	TON
42	NOX	20090721	20090721	274.62	9.08	283.70	TON
42	NOX	20091001	20090430	51,243.17	7,359.74	58,602.91	TON
42	PM10-PRI	20090101	20091231	39,767.15	801.48	40,568.63	TON
42	PM10-PRI	20090501	20090930	17,013.85	341.75	17,355.60	TON
42	PM10-PRI	20090721	20090721	122.22	1.29	123.51	TON
42	PM10-PRI	20091001	20090430	22,753.32	459.70	23,213.02	TON
42	PM25-PRI	20090101	20091231	32,151.32	731.58	32,882.90	TON
42	PM25-PRI	20090501	20090930	13,682.05	311.47	13,993.52	TON
42	PM25-PRI	20090721	20090721	98.27	1.27	99.54	TON
42	PM25-PRI	20091001	20090430	18,469.24	420.11	18,889.35	TON
42	SO2	20090101	20091231	241,357.14	714.19	242,071.33	TON
42	SO2	20090501	20090930	101,525.83	316.14	101,841.97	TON
42	SO2	20090721	20090721	729.73	2.27	732.00	TON
42	SO2	20091001	20090430	139,831.29	398.05	140,229.34	TON
42	VOC	20090101	20091231	1,662.19	186.10	1,848.29	TON
42	VOC	20090501	20090930	721.65	78.90	800.55	TON
42	VOC	20090721	20090721	5.15	0.40	5.55	TON
42	VOC	20091001	20090430	940.49	107.21	1,047.70	TON

PA

StateLevelSummaryM01.xls -- Emissions, 07/29/05

FIPS State	Pollutant Code	Start Date	End Date	"NIF" Emissions	"NoNIF" Emissions	Total Emissions	Emission Unit
42	CO	20180101	20181231	33,351.26	8,094.22	41,445.48	TON
42	CO	20180501	20180930	15,022.89	3,795.39	18,818.28	TON
42	CO	20180721	20180721	109.11	28.22	137.33	TON
42	CO	20181001	20180430	18,328.30	4,298.98	22,627.28	TON
42	NH3	20180101	20181231	947.48	842.84	1,790.32	TON
42	NH3	20180501	20180930	430.87	386.32	817.19	TON
42	NH3	20180721	20180721	3.14	1.84	4.98	TON
42	NH3	20181001	20180430	516.68	456.50	973.18	TON
42	NOX	20180101	20181231	69,291.66	13,589.07	82,880.73	TON
42	NOX	20180501	20180930	30,281.79	6,047.42	36,329.21	TON
42	NOX	20180721	20180721	220.42	12.63	233.05	TON
42	NOX	20181001	20180430	39,009.83	7,541.81	46,551.64	TON
42	PM10-PRI	20180101	20181231	30,665.89	914.51	31,580.40	TON
42	PM10-PRI	20180501	20180930	13,355.00	418.19	13,773.19	TON
42	PM10-PRI	20180721	20180721	95.99	2.00	97.99	TON
42	PM10-PRI	20181001	20180430	17,310.87	496.30	17,807.17	TON
42	PM25-PRI	20180101	20181231	22,911.09	844.61	23,755.70	TON
42	PM25-PRI	20180501	20180930	9,935.47	387.91	10,323.38	TON
42	PM25-PRI	20180721	20180721	71.42	1.98	73.40	TON
42	PM25-PRI	20181001	20180430	12,975.62	456.71	13,432.33	TON
42	SO2	20180101	20181231	135,231.53	714.19	135,945.72	TON
42	SO2	20180501	20180930	58,270.92	316.14	58,587.06	TON
42	SO2	20180721	20180721	418.85	2.27	421.12	TON
42	SO2	20181001	20180430	76,960.55	398.05	77,358.60	TON
42	VOC	20180101	20181231	1,697.33	222.26	1,919.59	TON
42	VOC	20180501	20180930	751.10	103.25	854.35	TON
42	VOC	20180721	20180721	5.37	0.55	5.92	TON
42	VOC	20181001	20180430	946.19	118.95	1,065.14	TON

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January 9, 2008

VIA FIRST CLASS MAIL AND EMAIL

Ms. Angela King
Environmental Planner
MARAMA
8600 LaSalle Road
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Comments on MANE-VU Draft Reports:
2018 Modeling Draft Report and BenMAP Draft Report

Dear Ms. King:

These comments are submitted on behalf of the Utility Air Regulatory Group ("UARG")[1] in response to a December 12, 2007 invitation from the Mid-Atlantic/Northeast Visibility Union ("MANE-VU"), asking stakeholders to comment on two reports: "MANE-VU Modeling for Reasonable Progress Goals" (dated December 10, 2007, and hereinafter referred to as the "Draft RPG Modeling Report") and "Public Health Benefits of Reducing Ground-level Ozone and Fine Particle Matter in the Northeast U.S.: A Benefits Mapping and Analysis Program (BenMAP) Study" (dated November 14, 2007, and hereinafter the "Draft BenMAP Report"). These two reports purport to evaluate how best to "satisfy[] a number of compliance goals under the Haze State Implementation Plan" (Draft RPG Modeling Report at viii); and how to quantify the "public health and monetary benefits" of both the Regional Haze Rule and other Clean Air Act-related regulatory programs (*see* Draft BenMAP Report at viii).

MANE-VU certainly is entitled to evaluate how best to meet the requirements of the Clean Air Act's Regional Haze Rule and to conduct whatever regulatory program cost/benefit

[1] UARG is an unincorporated association of individual electric utility companies and trade associations. UARG participates in federal and precedential state proceedings arising under the federal Clean Air Act and having an impact on UARG members. In particular, UARG has participated in the planning processes of Regional Planning Organizations ("RPOs") as they guide states in the preparation of regional haze plans to be submitted to EPA.

assessments it wishes to do. We are concerned, though, with statements in the reports that mis-characterize applicable regulatory requirements and that appear -- very late in the regional haze state implementation plan ("SIP") development process -- to be asking non-MANE-VU entities to implement more measures than they are currently required to implement just because MANE-VU claims it would be "reasonable" to do so.

A quick overview of the applicable legal requirements can put UARG's concerns into context. Under Clean Air Act sections 169A and 169B and implementing regulations, in order to prevent future, and remedy existing, impairment of visibility in mandatory class I federal areas which impairment results from manmade air pollution, states have been required to develop and to submit by December 17, 2007, "SIPs" that address measures to make "reasonable progress" toward that visibility improvement goal. In particular, as explained in greater detail in EPA's June 1, 2007 "Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program," (hereinafter "June 2007 Guidance") states "must establish [reasonable progress goals ("RPGs")], measured in deciviews (dv), for each Class I area for the purpose of improving visibility on the haziest days and ensuring no degradation in visibility on the clearest days over the period of each implementation plan." June 2007 Guidance at 1-2.

The regional haze program's overall visibility protection goal is intended to be achieved by 2064, with incremental progress being made in each of several planning periods along the way (*e.g.,* the first planning period runs from 2004 until 2018). EPA's regional haze rule also establishes an analytical requirement for states in the process of establishing RPGs for each planning period. "This analytical requirement requires States to determine the rate of improvement in visibility needed to reach natural conditions by 2064, and to set each RPG taking this 'glidepath' into account." *Id.* at 1-3. Although the June 2007 Guidance then sets out a process for determining the glidepath, or uniform rate of progress ("URP"), to be achieved in the first planning period, that Guidance plainly states that the glidepath "is not a presumptive target, and States may establish a RPG that provides for greater, lesser, or equivalent visibility improvement as that described by the glidepath." *Id.* The description of the RPG-setting process in the June 2007 Guidance is consistent with EPA's regional haze rules. See 40 C.F.R. § 51.308(d)(1), (2); 64 *Fed. Reg.* 35730-34 (July 1, 1999).

The June 2007 Guidance also recognizes that for some sources that are determined to be subject to best available retrofit technology ("BART") requirements, states "will already have completed a BART analysis. Since the BART analysis is based, in part, on an assessment of many of the same factors that must be addressed in establishing the RPG, it is reasonable to conclude that any control requirements imposed in the BART determination also satisfy the

RPG-related requirements for source review in the first RPG planning period. Hence, [a state] may conclude that no additional emissions controls are necessary for those sources in the first planning period." *Id.* at 4-2 to 4-3.

EPA's Guidance also notes that although the "[d]evelopment of the RPG for each Class I area should be a collaborative process among State, local, and Tribal authorities, [RPOs], and FLMs," (*id.* at 2-1), "States may not always agree on what measures would be reasonable or on the appropriateness of a RPG." *Id.* at 2-4. Thus, although EPA encourages states to work together to try to resolve any issues, EPA makes it clear that an individual state is to have "wide latitude" in determining any control requirements it believes need to be applied to sources in that state to meet the applicable RPGs. *Id.* at 4-2.

VISTAS, CENRAP and MRPO have been working for years to develop comprehensive emission inventories and modeling platforms for evaluating combinations of emission reduction scenarios that might achieve the regulatory visibility improvement goals. After considerable effort and at great cost, these RPOs determined in the summer and early fall of 2007 that the programs that are currently on the books -- and are in the midst of being implemented -- will in virtually all cases result in sufficient emission reductions to achieve the required visibility protection goals for the first planning period. In particular, VISTAS oversaw the development of a prototype modeling/emissions reduction analysis platform and made that platform available to each of its states early last summer. Individual states in VISTAS have in fact used that platform to develop their own regional haze SIPs. Although most of the VISTAS states were unable to meet the December 17, 2007 SIP submittal deadline, each has been able to make substantial progress towards finalizing comprehensive SIPs that are likely to be submitted to EPA for review in the first quarter of 2008. The CENRAP and Midwest RPO states have made similar progress in SIP development.

In the wake of such comprehensive efforts to develop compliant regional haze SIPs, on December 12, 2007 -- just five days before the official deadline for states to submit regional haze SIPs to EPA -- MANE-VU made available and asked for comment on its two recent draft reports addressing, among other things, potential control measures that MANE-VU would like non-MANE-VU states to adopt in the first planning period. Although acknowledging that measures now on the books and to be implemented by 2018 will be sufficient in the first planning period to achieve levels of visibility improvement well beyond the URP in all MANE-VU Class I areas, MANE-VU nonetheless asks that states in VISTAS, CENRAP and MRPO consider imposing on certain sources control measures that are more stringent than those included in these other states' regional haze SIPs as currently drafted.

For the reasons set out above, it is not necessary or appropriate for MANE-VU to ask other states to change course now to include additional control measures in their regional haze SIPs. Existing measures and other measures included in the state plans that have been drafted or proposed for comment are adequate (and, in many cases, more than adequate) to achieve visibility improvements approaching or going beyond the URP for their own and other states' Class I areas. In these circumstances, neither the Clean Air Act nor EPA's rules and guidance would require states to include additional control measures in their regional haze SIPs. The fact that MANE-VU claims that additional "measures are reasonable to implement" (Draft RPG Modeling Report at 6-1) does not change anything: no EPA rules or guidance requires other RPOs at this late date to revise their draft or final regional haze plans to address or incorporate the wish-list of additional control measures included in the draft MANE-VU reports.

Once the MANE-VU states have completed and submitted their own regional haze SIPs,[2] they can certainly continue their consultations with states in the other RPOs. All such discussions, however, should take into account the numerous other initiatives now being undertaken by EPA that will involve determinations regarding possible additional emission controls to achieve other Clean Air Act requirements.

UARG appreciates this opportunity to comment on the draft MANE-VU reports and looks forward to participating as appropriate in other proceedings by RPOs to address implementation of the Clean Air Act's visibility improvement requirements.

Very truly yours,

Andrea Field

Andrea Bear Field

cc: John E. Hornback
Jeffrey Peltola
Michael Koerber

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[2] It is our understanding that none of the MANE-VU states submitted its regional haze SIP to EPA by the December 17, 2007 deadline.

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April 25, 2008

VIA FIRST CLASS MAIL AND EMAIL

Ms. Angela King
Environmental Planner
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8600 LaSalle Road
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Comments on MANE-VU's 2018 Visibility Projections Draft Report

Dear Ms. King:

These comments are submitted on behalf of the Utility Air Regulatory Group ("UARG")[1] in response to the April 4, 2008 email invitation from the Mid-Atlantic/Northeast Visibility Union ("MANE-VU"), asking stakeholders to comment on its "2018 Visibility Projections" Draft Report (hereinafter "2018 Visibility Projections Draft Report"). As explained in that email invitation, the 2018 Visibility Projections Draft Report provides information on MANE-VU's efforts to quantify the "visibility impacts of those measures that are being actively considered by MANE-VU states as a result of the regional haze consultation process . . . [and] will be useful to the MANE-VU states as they establish reasonable progress goals and develop their long-term emissions management strategies for Class I areas under the federal Regional Haze Rule."

[1] UARG is an unincorporated association of individual electric utility companies and trade associations. UARG participates in federal and precedential state proceedings arising under the federal Clean Air Act and having an impact on UARG members. UARG has participated in the planning processes of Regional Planning Organizations ("RPOs") as they guide states in the preparation of regional haze plans to be submitted to EPA.

MANE-VU's 2018 Visibility Projections Draft Report attempts to describe the complicated process that MANE-VU followed to evaluate what the impact on visibility would be in 2018 if, by that year (1) electric generating units ("EGUs") in the states in MANE-VU, VISTAS and the Midwest Regional Planning Organization ("MRPO") implement the emission reductions required by the Clean Air Interstate Rule ("CAIR") (as projected by IPM version 2.1.9 modeling); (2) those states also implement certain additional emission reductions from non-EGU sectors (including best available retrofit technology ("BART") emission controls at a limited number of non-EGU sources); and (3) certain emission reductions (described below) occur from EGUs in Ontario. Given the very summary description of the MANE-VU analysis provided in the draft report, some aspects of the analysis are unclear and should be explained in more detail in the final version of the report.[2]

Most important, however, is the conclusion provided in the draft report, *i.e.*, that under the emission reduction scenario used in the analysis "[a]ll MANE-VU [Class I area] sites are projected to meet or exceed the uniform rate of progress goal for 2018 on the 20 percent worst days." 2018 Visibility Projections Draft Report, Section 3. In addition, the draft report concludes that, under that scenario, there is no projected worsening of visibility on the 20 percent best days. *Id.*

Given these conclusions -- and findings by other RPOs that, in general, Class I areas in the eastern half of the country for the most part will meet or exceed their uniform rates of progress for 2018 -- we believe it is appropriate for states in the affected RPOs to continue to develop regional haze state implementation plans ("SIPs") for the first planning period that (1) reflect the emission reduction levels for EGUs that result from compliance with CAIR, and (2) do not

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[2] For example, the draft report fails to explain why the analysis (1) subtracted 75,809 tons from "one hypothetical stack in the [MANE-VU] region" to satisfy the "shortfall" between projected 2018 EGU emissions at those MANE-VU EGU stacks that are among the "167 top EGU stacks" and MANE-VU's 90-percent reduction target for those stacks, but then (2) added back that same number of tons at the same hypothetical MANE-VU stack. Why was that procedure used for EGUs in the MANE-VU region while another procedure was used for EGUs in VISTAS and MRPO states (where the analysis apparently used information related to actual stacks and actual EGUs and applied a somewhat more geographically refined emission "add-back")? 2018 Visibility Projections Draft Report, Section 2.1.

include additional emission reduction requirements for EGUs. We also believe that EPA would be justified in approving any such SIPs.

In presenting its analysis, MANE-VU refers (in Section 2 of the 2018 Visibility Projections Draft Report) to "a number of additional potentially reasonable control measures," including "additional SO_2 emissions reductions at electric generating units (EGUs)." Presumably, this is a reference to MANE-VU's "top 167 stacks" scenario. For the reasons described above, it is neither necessary nor appropriate, as part of the current regional haze SIP development process, to impose -- or to ask other states to impose -- additional control measures on EGUs. The above-described MANE-VU modeling projections show that no such additional control measures are needed to meet or exceed the uniform rate of progress for 2018 at MANE-VU Class I areas.

Any effort to evaluate what visibility improvements may be needed or appropriate should take into account, in a much more systematic way than the draft report does, the impact of non-U.S. anthropogenic emissions. MANE-VU appropriately considers in its analysis the impact of SO_2 emission reductions that are expected to occur from six coal-burning EGUs in Ontario that are scheduled to be shut down and replaced with nine natural gas turbine units with NOx controls. *See* 2018 Visibility Projections Draft Report, Section 2.4. As MANE-VU recognizes by its consideration of this factor, emissions from Canadian sources plainly can have significant effects on visibility in the MANE-VU states. SO_2 emissions from the six Ontario EGUs considered by MANE-VU in its analysis, however, are merely a subset of non-U.S. anthropogenic emissions of visibility-impairing pollutants that likely contribute to visibility impairment in MANE-VU Class I areas. UARG believes that if MANE-VU (and the other RPOs) address the effects of such emissions in a more systematic way in their 2018 visibility projections,[3] that would further demonstrate the sufficiency of current and planned emission controls to achieve reasonable progress goals.

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[3] Attached is a copy of a paper by the Electric Power Research Institute ("EPRI") concerning a method for taking the effect of these emissions into account in visibility analyses. Also attached is a white paper providing further information on the method described by EPRI. UARG urges MANE-VU to apply the approach described by EPRI, or a similar technically justified approach, to assess in a comprehensive way the impact of emissions from non-U.S. anthropogenic sources on projected 2018 visibility in MANE-VU Class I areas. UARG encourages MANE-VU to present that assessment in the final version of its report.

HUNTON & WILLIAMS

UARG appreciates this opportunity to comment on the draft MANE-VU report and looks forward to participating as appropriate in other proceedings by RPOs to address implementation of the Clean Air Act's visibility improvement provisions.

Very truly yours,

Andrea Field

Andrea Bear Field

cc: John E. Hornback
Annette Sharp
Michael Koerber

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Effect of Transboundary Pollution on Visibility A Case Study for Northern Class I Areas

Technical Brief

Introduction

The Regional Haze Rule (RHR) was promulgated by the U.S. Environmental Protection Agency (EPA) in 1999 to address mitigation of regional haze in the United States. The RHR calls for states to establish reasonable goals and emission reduction strategies for improving visibility in mandatory Class I areas (national parks and wilderness areas), striving to achieve "natural visibility conditions" by 2064. The RHR requires that the visibility at these Class I areas on the 20% worst haze days (expressed in deciviews) should improve along a "uniform rate of progress" (URP). EPA has prescribed that the URP be calculated exclusively from the difference between the 20% worst haze conditions in the 2000–2004 baseline period and under natural conditions in 2064. The URP serves as a reference in determining a state's progress toward achieving the 2064 goal. States are required to develop plans every 10 years to meet the reasonable progress goals (RPG) based on the URP. The plans for the first implementation period that call for meeting the RPG in 2018 are due in 2008.

EPA defines natural conditions as those that would exist "in the absence of human caused impairment." From a practical point of view, reaching this goal of natural conditions in the United States is impossible because air pollution from other countries gets transported across the border and increases the U.S. pollutant concentrations above the natural level. According to EPA, a contribution from transboundary transport is not to be considered when setting the 2064 natural conditions goal, even though a major fraction of the actual visibility impairment at some near-border Class I areas may be due to transboundary transport of pollution. However, if a state has difficulty achieving visibility improvement progress along the URP line, it may present transboundary transport as a mitigating reason, if appropriate. A state has to first estimate the impact of transboundary pollution on the visibility impairment at a Class I area of interest.

Figure 1 illustrates a conceptual method to quantify the effect of transboundary pollution when determining whether an RPG has been met for a particular site. Point "A" represents the 2018 progress goal calculated via the URP "glide slope" and point "X" represents the estimated 2018 design value (that is, the model estimated value accounting for emissions reductions by 2018). If transboundary pollution can explain the difference between values at points, A and X, a state can still show it has made "reasonable" progress toward meeting the EPA-prescribed URP.

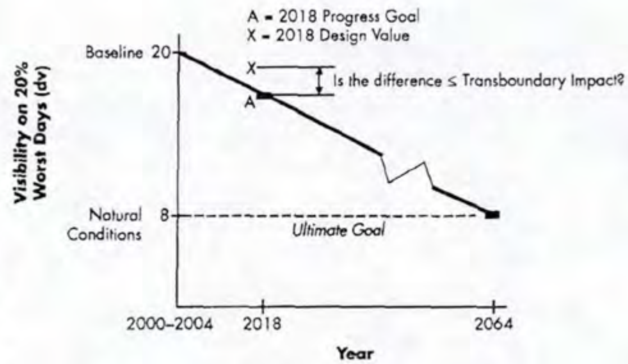

Figure 1. Illustration of a Way to Account for Transboundary Pollution.

Estimating Transboundary Pollution

Global chemical transport modeling offers a means of estimating the contributions of transboundary pollution. With EPRI support, Harvard University used a global chemical transport model, GEOS-Chem, to assess the amount of transported pollutants coming from outside the United States and their impact on meeting the RHR. An important finding from that work was that the current transboundary transport of ammonium sulfate is significantly higher than the default natural concentrations. This transport is mostly from Canada and Mexico, but there is also a non-negligible contribution from Asia. Other haze-causing pollutants whose transboundary influence was significant included organic carbon, dust, and ammonium nitrate (at the northern Class I areas in the upper Midwest).

The Harvard simulations were performed for 2001, whereas most states are using 2002 as the base year for modeling for developing their implementation plans for the RHR. Using the same principles as used by Harvard, VISTAS (Visibility Improvement State and Tribal Association of the Southeast) has estimated transboundary pollution at all Class I areas in the United States for 2002 using the EPA's CMAQ (Community Multiscale Air Quality) model. The model was run for three configurations by VISTAS:

- Run 1: Base case with all emissions
- Run 2: Simulation with no U.S. anthropogenic emissions
- Run 3: Simulation with no global anthropogenic emissions

For each of these simulations, boundary conditions were provided by the GEOS-Chem model that was also run separately for each scenario. The transboundary anthropogenic impact was calculated by subtracting concentrations obtained using Run 3 from those obtained using Run 2.

Effect of Transboundary Pollution at Northern Class I Areas

Four Class I areas (Voyagers National Park, MN; Seney National Wildlife Refuge, MI; Boundary Waters Canoe Area Wilderness, MN; and Isle Royale National Park, MI) were chosen to examine the effect of transboundary pollution on meeting the RPG for 2018. This was done by first calculating the URP for each site and then estimating points "A" and "X" (as shown in Figure 1). The data for calculating the base case (2000–2004) visibility conditions, 2064 natural conditions, and the 2018 design values were obtained from the Midwest Regional Planning Organization (MRPO). For each site, MRPO provided the observed conditions (species concentrations) for all the 20% worst haze days occurring from 2000 to 2004, average natural visibility conditions for the 20% worst haze days, and the 2018 relative reduction factors (RRFs) for each species for the corresponding 20% worst haze days in 2002.

The following steps were undertaken to estimate the effect of transboundary pollution at these sites:

1. The base case visibility in deciviews was calculated by averaging the deciviews for the 20% worst haze days occurring from 2000 to 2004. The new IMPROVE equation was used to convert species concentrations to light extinction.

2. The 2018 RPG (in deciviews) was calculated assuming a linear progression from the base case visibility in 2004 (calculated in Step 1) to the natural visibility in 2064.

3. The 2018 design value was calculated by first multiplying the 2018 RRFs for each species with the corresponding concentration of that species from 2000 to 2004 to estimate the future concentrations of those species. The new IMPROVE equation was then used to convert the species concentrations to light extinction. The deciviews were calculated for each day (corresponding to the 20% worst haze days from 2000 to 2004) and then averaged to calculate the 2018 design value.

4. The transboundary concentrations (obtained from VISTAS) corresponding to the 20% worst haze days in 2002 were averaged to get an average value for each species. These concentrations were subtracted from the corresponding concentrations calculated for the future year (2018) in Step 3. The resulting concentrations for each species for each of those days were converted to light extinction using the new IMPROVE equation and then converted to a revised design value for 2018.

If the design value calculated in Step 3 is below the URP, then the state has achieved the RPG for that Class I area. However, if the design value is above the URP, then the revised design value calculated in Step 4 can be examined. If the revised design value is below the URP, the argument can be made that transboundary pollution is responsible for that Class I area not meeting its URP, and the state can cite that as a mitigating reason.

Results

Figure 2 shows the glide slope calculation and the 2018 design values for the Boundary Waters Class I area. The solid blue line denotes the URP with the solid diamond in 2018 showing the RPG. The light blue open rectangle shows the 2018 design value. In this case, the design value is above the URP line; therefore, it fails to meet the RPG for 2018. However, the red open triangle shows that the revised 2018 design value (removing the effect of transboundary pollution) is below the URP line; thus, the state is able to meet the "reasonable" progress goal.

Figures 3, 4, and 5 show similar plots for Isle Royale, Voyagers, and Seney. As the data show, in each case, removing the effect of the transboundary pollution allows each of these Class I areas to achieve the 2018 RPG (although it is still slightly above the URP at Voyagers).

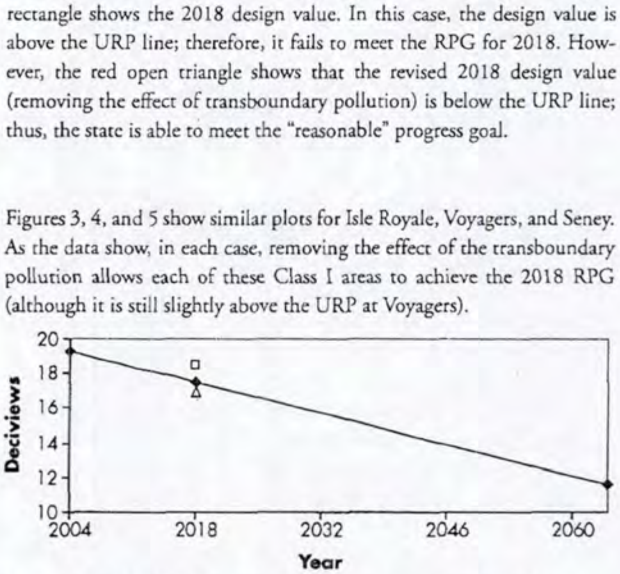

Figure 2. Glide Slope Calculation for Boundary Waters Canoe Area Wilderness

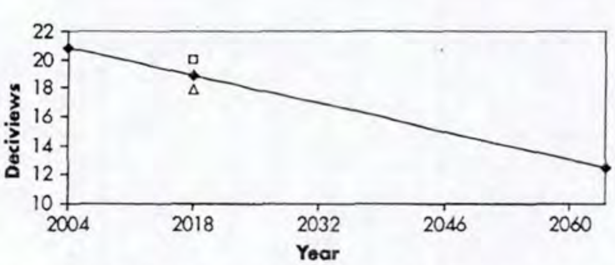

Figure 3. Glide Slope Calculation for Isle Royale National Park

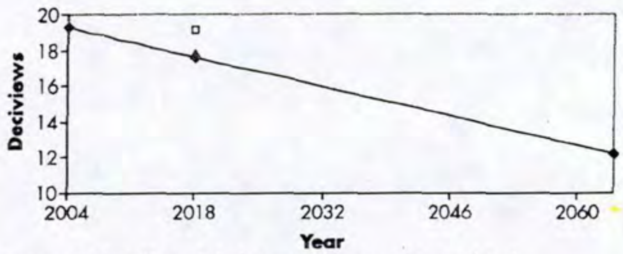

Figure 4. Glide Slope Calculation for Voyagers National Park

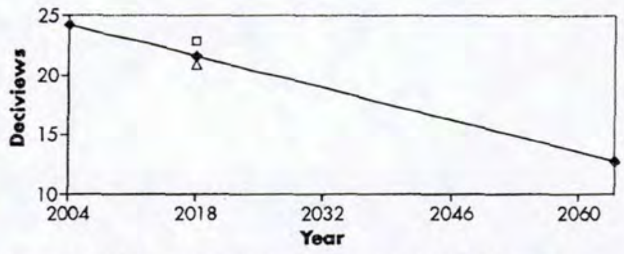

Figure 5. Glide Slope Calculation for Seney National Wildlife Refuge

1015251 May 2007

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October 2007

ASSESSING VISIBILITY EFFECTS OF INTERNATIONAL EMISSIONS UNDER THE CLEAN AIR ACT REGIONAL HAZE PROGRAM

A recurring issue in implementation of the Clean Air Act regional haze program concerns how to account for effects of international emissions, particularly man-made emissions, on visibility in the United States. This issue has generated discussion recently among federal and state officials and others addressing regional haze implementation. This paper summarizes an approach that many states (including states in the VISTAS and CENRAP regional planning organizations (RPOs)) are using to account appropriately for effects of non-U.S. emissions. As discussed below, that approach is consistent with EPA's regional haze rules and, contrary to some recent suggestions, does not "redraw" the uniform rate-of-progress "glidepath" for visibility improvement.

Accounting for Foreign-Source Manmade Emissions

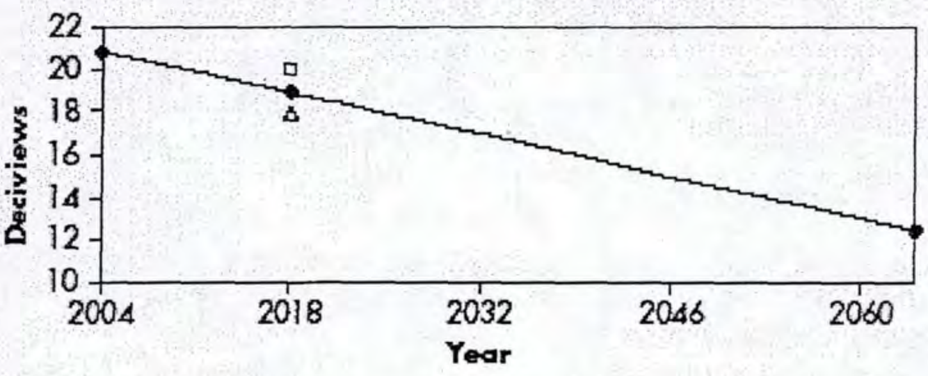
The regional haze program's overarching "national goal" is "the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution." (Clean Air Act § 169A(a)(1).) States must develop, and submit by December 17, 2007, state implementation plans (SIPs) to make "reasonable progress" toward that goal. These SIPs must state, and explain, reasonable progress goals (RPGs) for 2018 for relevant Class I areas.

EPA has long recognized the obvious fact that states have no power to control emissions from sources located outside the United States, and states cannot be expected to offset the visibility effects of foreign-source manmade, or anthropogenic, emissions through additional emission reductions at domestic sources. In developing their SIPs, however, states need some reasonable way to account for those effects. A method to do so is described in a May 2007 report by the Electric Power Research Institute (EPRI).[1] This method relies on available data and models, such as the GEOS-Chem model, to assess visibility-impairing emissions from non-U.S. sources and the effects of those emissions on the ability to meet RPGs for Class I areas. As the report discusses, this method also has been used in VISTAS, the southeastern states' RPO, which used EPA's Community Multiscale Air Quality (CMAQ) model in its analysis.

[1] The report is available at http://my.epri.com/portal/server.pt?Abstract_id=000000000001015251.

This method allows a comparison between: (1) projected visibility conditions (in deciviews) at a given Class I area in 2018 reflecting the modeled effects of all emissions regardless of type or location of source (*i.e.*, U.S. anthropogenic emissions, non-U.S. anthropogenic emissions, and emissions from natural sources both inside and outside the U.S); and (2) the visibility conditions that would be projected to exist at that area in 2018 if non-U.S. anthropogenic emissions were removed from the emission inventory. The modeled visibility values for 2018 can be plotted on a graph that also displays the "uniform rate of progress" (URP) glidepath for the area in question. (The URP, which states must consider under the regional haze rules, is a steady rate of visibility improvement at the Class I area from the 2000-2004 baseline period to the 2064 "natural conditions" target date described in the rules.)

Shown below is an example, from the EPRI report, of a graphic presentation of the results of this kind of assessment. This example shows projected values for Isle Royale National Park in Michigan.[2] The straight blue line shows the URP for that Class I area. The blue square shows the projected 2018 deciview level reflecting the effects of all emissions, including non-U.S. anthropogenic emissions. The red triangle shows the projected 2018 deciview level if non-U.S. anthropogenic emissions are removed. In this example, the projected deciview level with all emissions included (the blue square) is above the URP, meaning that projected visibility is worse than the visibility represented by the URP. But the projected deciview level with non-U.S. anthropogenic emissions excluded (the red triangle) is lower than the URP, meaning that projected visibility would be better than the URP if non-U.S. anthropogenic emissions were removed.



[2] The report describes results of analyses showing significant transboundary impact in four Class I areas in the Northern Midwest (Seney National Wildlife Refuge, Boundary Waters Canoe Area Wilderness, and Voyageurs National Park, in addition to Isle Royale). Though not discussed in the report, EPRI and VISTAS modeling results also show that transboundary emissions can have significant effects on visibility impairment in Class I areas near the Mexican border.

Consistency with EPA's Rules and Guidance

As can be seen from the illustration on the preceding page, this approach does *not* modify the URP glidepath. Instead, it shows projected deciview levels -- both levels with and levels without the visibility effects of non-U.S. anthropogenic emissions -- in 2018. That is important because the regional haze rules indicate, and EPA has reiterated in guidance, that the URP is to be set using only baseline conditions and projected natural conditions in 2064. Thus, it seems clear that states may not *change* the URP by, for instance, increasing the 2064 "natural conditions" deciview level to account for the effects of non-U.S. anthropogenic emissions (which would in turn increase the 2018 point on the "adjusted" URP).

The approach discussed in the EPRI report is consistent with EPA's statements about how states may account for international emissions' effects on Class I area visibility. For example, in the preamble to its final regional haze rules, EPA responded to commenters' "concerns that EPA should take into account that States are not able to control international sources in reviewing a State's proposal for a reasonable progress target":

> EPA agrees that the projected emissions from international sources will in some cases affect the ability of States to meet reasonable progress goals. The EPA *does not expect States to restrict emissions from domestic sources to offset the impacts of international transport* of pollution. We believe that States *should evaluate the impacts of current and projected emissions from international sources* in their regional haze programs, particularly in cases where it has already been well documented that such sources are important. At the same time, EPA will work with the governments of Canada and Mexico to seek cooperative solutions on transboundary pollution problems.

64 Fed. Reg. 35714, 35736 col. 3 (July 1, 1999) (emphasis added). In informal guidance issued in 2006, EPA elaborated on states' authority to evaluate and take into account the effects of foreign emissions. For example, EPA stated:

> Both in explaining RPGs and in assessing whether current implementation plan strategies are achieving them, States can take into account the nature of international emissions. For instance, after having applied the four statutory factors [that states must consider in determining reasonable progress] and calculated their RPGs, states can at their discretion, quantify the effects of international emissions

> on their ability to reach RPGs. However, States should not directly consider the effects of international emissions when calculating their uniform rates of progress by either adding the effects of international emissions to their estimates of natural conditions, or by subtracting international emissions from current conditions. Either of these approaches conflicts with the basic definition of "current conditions" (baseline conditions for the first SIP) and "natural conditions," as described in the 1999 [regional haze rules].

EPA, "Additional Regional Haze Questions" (Sept. 27, 2006 Revision) at 19.

The approach that is described in the EPRI report and that is being used by a number of states to account for non-U.S. anthropogenic emissions does not change the definition or calculation of current or natural visibility conditions. Thus, it does not change the deciview values used in determining the URP and does not change the URP itself. Rather, that approach is simply a tool to use in "explaining [the] RPGs" that states select and in "quantify[ing] the effects of international emissions on their ability to reach RPGs," consistent with EPA guidance.[3]

Recently, certain statements have been made by staff members in EPA regional offices and at Federal land manager (FLM) agencies, among others, regarding the approach described in the EPRI report that appear to reflect a misunderstanding of that approach. For example, responding to a VISTAS state's presentation in a September 2007 inter-RPO conference call about that state's evaluation of international-emission effects (conducted along the lines of the approach described in EPRI's report), one EPA-region staff member initially said that that approach appeared to involve redrawing the URP. A similar comment was made later by another EPA-region staff member, who suggested the approach seems to involve setting a new glidepath. And an FLM analyst indicated he

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[3] It is important to note that EPA's rules do not require a state to determine that the URP is the RPG for a given area; states may, for example, properly determine that the RPG should be less ambitious than the URP. 40 C.F.R. § 51.308(d)(1)(ii); 64 Fed. Reg. at 35732 cols. 2-3; EPA, Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program, at p. 1-3 (June 1, 2007) ("The glidepath is not a presumptive target, and States may establish a RPG that provides for greater, lesser, or equivalent visibility improvement as that described by the glidepath."). Because EPA does not require or expect states to restrict domestic sources' emissions to offset the impacts of international transport, it would seem that states have discretion to consider effects of non-U.S. manmade emissions as a "relevant factor[ ]"in "determin[ing] what additional control measures would be reasonable," which is one of the steps in the state's selection of the rate of progress that is reasonable. *Id.* at p. 2-3. Doing so would not change the URP but may result in establishing an RPG that is less ambitious than the URP.

thought this approach reflected an inappropriate technique for accounting for non-U.S. emissions.

For the reasons discussed above, it seems clear that these criticisms reflect a fundamental misunderstanding of this approach, which does not call for any redrawing or other adjustment of the glidepath. The following points should be kept in mind -- and articulated -- in any discussion of this issue:

- **The approach described by EPRI does not recalculate the Uniform Rate of Progress (URP) glidepath. Calculation of the glidepath is based only on the 2000-2004 observed conditions (the "current," or baseline, conditions) and the 2064 natural conditions. The 2018 URP is calculated from the glidepath.**

- **This approach does not add transboundary impact (*i.e.*, visibility impact from non-U.S. anthropogenic sources) to either the baseline or the 2064 "natural conditions" end point.**

- **This approach is consistent with and, in fact, uses transboundary contribution estimates from VISTAS.**

- **The 2018 Reasonable Progress Goal (RPG) for a given Class I area is calculated as the visibility conditions (in deciviews) that an area is projected to achieve in 2018 from implementation of a reasonable set of emission controls selected by the state, based on the state's consideration of the statutory "reasonable progress" factors.**

- **Assessing transboundary impact may be particularly important if the 2018 RPG selected by the state is at a higher deciview level than the 2018 URP level. In such cases, this approach can be useful for the state in understanding and explaining: (1) the extent to which the deciview difference between the 2018 RPG and the 2018 URP may be accounted for by transboundary impact on the Class I area at issue; (2) why, for that area, meeting the URP would require unreasonably rapid progress; and (3) why the progress goal selected by the state is reasonable.**

- **For the Northern Midwest Class I areas, an EPRI analysis using this approach showed that the transboundary impact is significant. EPRI and VISTAS modeling results also show that the transboundary impact can be significant for Class I areas near Mexico.**

Appalachian Mountain Club

Appalachian Mountain Club (AMC) Comments on the Draft Final New Hampshire Regional Haze SIP Revision May 22, 2009

Submitted June 26th, 2009

AMC is very concerned about pollution that causes regional haze because of the importance of clean air and clear views to our 90,000 members, almost 10,000 of whom are NH residents. Fine particulate pollution, that causes poor visibility, is detrimental to the health of outdoor enthusiasts and the recreation experience in the mountains of the Eastern US. AMC has monitored fine particulate concentrations and its associated acidity since 1988 in the White Mountains of NH, adjacent to the two Class I areas Great Gulf and Presidential Dry River Wildernesses, and recently published our findings (see Murray, et al., 2009[1]). We sees more than 500,000 visitors annually to our front and backcountry NH facilities, the majority of whom greatly value natural resources such as sprawling views from ridgelines. AMC's Mountain Watch visibility monitoring, with more than 2,500 participants, and its 1990's visibility studies[2] have also documented how backcountry visitors value high visibility days in NH's mountains. The White Mountains see more than 6 million visitors annually seeking natural beauty, clean air, and clear vistas. These statistics highlight the convergence of economic and natural resource values that clear views contribute to the state of NH, and support the urgent need to address the Congressionally-mandated visibility requirements under the Clean Air Act and implementation of the Regional Haze Rule.

AMC has been an active participant in the MANE-VU stakeholder process and we continue to track the development of Regional Haze State Implementation Plans (RH SIPs) by individual states in the Northeast and Mid-Atlantic area. We appreciate the efforts by the NH DES staff in the Regional Haze planning process, including their valuable contributions to the MANE-VU regional planning organization.

AMC supports NH's and MANE-VU's general approach to addressing regional haze by applying the Regional Haze and BART regulation and guidelines. AMC did express our concern through the public comment process about whether the issuance of the Merrimack Station's Temporary Permit TP-0008, to install the wet scrubber to reduce SO2 emissions, followed proper New Source Review regulations. Further, AMC believes that issues of overall cost of compliance, including the most recent cost estimates and taking into account all state and federal regulations, along with stakeholder input, should be considered as part of the states decision to move ahead with the scrubber compliance option on Merrimack Station. However those specific concerns are not the focus of these comments, which instead will address the overall regional haze requirements and compliance strategy proposed in NH's RH SIP.

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[1] Abstract Web Link: http://dx.doi.org/10.1016/j.atmosenv.2009.03.060

[2] See Publication: http://www.fs.fed.us/rm/pubs/rmrs_p015_5/rmrs_p015_5_304_311.pdf last viewed 6/25/09

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MANE-VU Ask

We strongly support the MANE-VU 167 targeted stack strategy that looks to control, by 90% or more, EGUs SO2 emissions that contribute to visibility impairment at Class I areas in the region. Three NH stacks, two of which are BART-eligible sources, were identified in the MANE-VU 167 stack strategy. We applaud the MANE-VU states, including NH, for going beyond BART and the on-the-way (OTW) regulations by developing a low sulfur fuel oil strategy.

AMC urges NH to include federally enforceable controls in its SIP to meet its commitment of a 90% reduction in SO2 emissions under the Targeted EGU Strategy. Preferably, NH should add a specific commitment to reduce SO2 emissions at NT1, a BART-eligible source, by 90%. NH should exhaust all possible options (fuel switching to natural gas, earlier use of 0.5%-S fuel oil, and/or an increase in enforceable reduction at Merrimack station to greater than 90%) to reduce the overall emissions for the 3 targeted stacks by 90%. AMC provides the following table to clarify the difference between the emission reduction targets from the MANE-VU Ask and the NH SIP. We recognize that NH and other states are provided some flexibility in meeting their regional haze obligations, and that NH has worked extensively to achieve the planned reductions included in this draft. However, it would be a missed opportunity to further improve NH air quality to not require 90% reduction of SO2 from each target EGU. Furthermore, the example put forth in NH's RH SIP commitments will provide our state important leverage as we ask other states to control emissions that impact visibility in our Class I airsheds.

NH Stacks[1]	MANE-VU 2002 Emissions[2]	90% Ask Emissions	NH SIP 2002 Emissions[3]	90% Ask Emissions	NH RH SIP[4]
MK1	9,352	935	9,754	975	975
MK2	19,444	1,944	20,902	2,090	2,090
NT1	5,031	503	5,226	523	3,484
	33,827	***3,383***	35,882	***3,588***	***6,550***

1 Identified NH stacks in MANE-VU Ask
2 Average of Emissions provided by MANE-VU in the Ask, MM5 and VTDEC 2002 TPY
3 NH SIP Emission values from 2002 CEM data
4 Note that NT1 is based on the Low Sulfur strategy also provided in the MANE-VU Ask

Visibility Metrics

AMC generally supports the use of the "alternative method" for calculating baseline and natural visibility in deciviews. This approach was vetted through the IMPROVE steering committee and has valid scientific principles behind it.

BART Provisions

AMC strongly supports NH's decision to not exempt any BART-eligible sources from the BART determination process, consistent with MANE-VU's position. Furthermore, AMC agrees with NH that CAIR should not equal BART and appreciate that NH is committed to revisiting its RH SIP once the EPA issues a response to the CAIR remand. The courts found error in EPA's CAIR, in part, due to the use of cap and trade to address specific locations NAAQS non-attainment. Similarly the CAA visibility requirements, with the BART provisions as one tool, look to clean up sources impacting visibility in Class I National Parks and Wilderness areas. Therefore a cap and trade approach is an unacceptable solution to addressing regional haze.

Section 11.4.3
Table 11.1 The final column in this table appears to have incorrect values for NT1 2018 SO2 Emissions and the Total Emissions for 2018.

Section 11.8
Page 133 NH DES should clarify in this section, as they did in section 10.3, that the alternative method was used to calculate baseline and natural visibility.

Page 134 The 3rd bullet states that the glide slope was "created by linear interpolation between the 20 percent worst visibility baseline value in 2004 and the 20 percent worst visibility value under natural conditions in 2064." The glide slope should be based on linear interpolation between the *average* 20 percent worst visibility baseline value *from 2000-2004* and the 20 percent worst visibility value under natural conditions in 2064. It is difficult to read the values off the graph and determine what the actual glide slope is (in dv/year) and therefore difficult to determine what method was actually used by NH DES. The agency correctly refers to the baseline visibility average values (2000-2004) throughout the SIP, however it needs to clarify what was used to calculate the glide slope and what the actual rate of change is.

Section 11.11
Page 140-141 NH DES discusses its obligation to ensure that control measures are federally enforceable to comply with the RHR requirements. Earlier in the SIP NH states that existing NOx and PM controls are considered BART; however, it is unclear that these controls will be federally enforceable with the information and attachments provided. This can be resolved by NH DES submitting as part of the RH SIP the appropriate Title V permits that provide federally enforceable requirements for operation of the SCR and ESP. While year round SCR is currently expected due to NOx RACT requirements, it is important to see the permit documents that identify this. We recognize that NH does not have a merged construction and Title V permitting program, but the Temporary Permit referred to (TP-0008) does not identify enforcement of NOx and PM controls.

AMC appreciates the opportunity to provide comments to NH DES as part of the RH SIP process. We urge NH to finalize an enforceable emission reduction strategy that adheres to the most aggressive reductions found in the MANE-VU Ask, providing important reductions in regional haze pollution and improving NH's air quality.

Sincerely,

Georgia Murray
AMC Staff Scientist
gmurray@outdoors.org
603-466-2721 x8111

New Hampshire Regional Haze SIP Revision
Responses to AMC's Comments

On June 26, 2009, the New Hampshire Department of Environmental Services (NHDES) received comments from Georgia Murray, staff scientist from the Appalachian Mountain Club (AMC), on New Hampshire's draft final Regional Haze SIP, May 22, 2009. Many of AMC's comments supported the decisions and methodologies employed in development of the SIP and do not require a response. For specific comments that do need responses, NHDES provides the following. **Comments are written in *italics* and responses are written in regular font.**

MANE-VU Ask. *AMC urges NH to include federally enforceable controls in its SIP to meet its commitment of a 90% reduction in SO_2 emissions under the Targeted EGU Strategy. Preferably, NH should add a specific commitment to reduce SO_2 emissions at NT1, a BART-eligible source, by 90%. NH should exhaust all possible options (fuel switching to natural gas, earlier use of 0.5%-S fuel oil, and/or an increase in enforceable reduction at Merrimack station to greater than 90%) to reduce the overall emissions for the 3 targeted stacks by 90%. AMC provides the following table to clarify the difference between the emission reduction targets from the MANE-VU Ask and the NH SIP. We recognize that NH and other states are provided some flexibility in meeting their regional haze obligations, and that NH has worked extensively to achieve the planned reductions included in this draft. However, it would be a missed opportunity to further improve NH air quality to not require 90% reduction of SO_2 from each target EGU. Furthermore, the example put forth in NH's RH SIP commitments will provide our state important leverage as we ask other states to control emissions that impact visibility in our Class I airsheds.*

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	33,827	**3,383**	35,882	**3,588**	**6,550**
1 Identified NH stacks in MANE-VU Ask					
2 Average of Emissions provided by MANE-VU in the Ask, MM5 and VTDEC 2002 TPY					
3 NH SIP Emission values from 2002 CEM data					
4 Note that NT1 is based on the Low Sulfur strategy also provided in the MANE-VU Ask					

▶ NHDES Response: NHDES recognizes the need for enforceable control measures. Enforceable provisions for SO_2 emission reductions are in place for Units MK1 and MK2 and are in progress for Unit NT1. However, because of its low utilization rate and capacity factor, retrofitting Unit NT1 for flue gas desulfurization is not economically feasible. Consequently, the only practical means of reducing SO_2 emissions at this plant is to control the sulfur content of fuels used. NHDES has prepared a draft rule that will limit SO_2 emissions from Unit NT1 to 0.50 lb/MMBtu – a limitation that will require the operator to regulate and monitor fuel sulfur content. While this provision will not achieve the desired 90 percent SO_2 reduction from this facility that was sought under the Ask, there are at least two mitigating circumstances to consider. First, the 90-percent reduction for Units MK1 and MK2 is a *minimum*. The actual reduction is expected to exceed this value; and, in fact, meeting the maximum sustainable rate is a requirement of the facility's draft Title V operating permit. Second, emissions from Unit NT1 have been trending lower since 2002 because of the plant's low usage. For example, reported SO_2 emissions were 586 tons in 2008, a nearly 90 percent reduction from the 2002 base year. The combination of these circumstances is likely to put total SO_2 emission reductions from the three units at or below the 90 percent target.

New Hampshire, in concert with the other MANE-VU states and the Ozone Transport Commission, is contemplating further controls to reduce SO_2 emissions across the region. One important initiative focuses on emission controls for industrial, commercial, and institutional boilers. NHDES is committed to a thorough reevaluation of the 167 EGU strategy and related SO_2 control measures as part of the regional haze midcourse review circa 2013 to ensure that New Hampshire is doing its part to achieve established visibility goals.

Section 11.4.3. *Table 11.1 The final column in this table appears to have incorrect values for NT1 2018 SO_2 Emissions and the Total Emissions for 2018.*

- NHDES Response: The errors in the table have been corrected.

Section 11.8. *Page 133 NH DES should clarify in this section, as they did in section 10.3, that the alternative method was used to calculate baseline and natural visibility.*

- NHDES Response: The following sentence has been added to the text pertaining to 2000-2004 baseline and natural visibility values: "Note that both natural conditions and baseline visibility for the 5-year period were calculated in conformance with an alternative method recommended by the IMPROVE Steering Committee."

Page 134 The 3rd bullet states that the glide slope was "created by linear interpolation between the 20 percent worst visibility baseline value in 2004 and the 20 percent worst visibility value under natural conditions in 2064." The glide slope should be based on linear interpolation between the average 20 percent worst visibility baseline value from 2000-2004 and the 20 percent worst visibility value under natural conditions in 2064. It is difficult to read the values off the graph and determine what the actual glide slope is (in dv/year) and therefore difficult to determine what method was actually used by NH DES. The agency correctly refers to the baseline visibility average values (2000-2004) throughout the SIP, however it needs to clarify what was used to calculate the glide slope and what the actual rate of change is.

- NHDES Response: The distinction regarding linear interpolation is noted and the text has been revised accordingly. Also, the following sentence has been added under the bullet for the glide slope (straight green line): "Visibility values used for the calculation of uniform rate of progress may be found in Table 10.1."

Section 11.11. *Page 140-141 NH DES discusses its obligation to ensure that control measures are federally enforceable to comply with the RHR requirements. Earlier in the SIP NH states that existing NOx and PM controls are considered BART; however, it is unclear that these controls will be federally enforceable with the information and attachments provided. This can be resolved by NH DES submitting as part of the RH SIP the appropriate Title V permits that provide federally enforceable requirements for operation of the SCR and ESP. While year round SCR is currently expected due to NOx RACT requirements, it is important to see the* *permit documents that identify this. We recognize that NH does not have a merged construction and Title V permitting program, but the Temporary Permit referred to (TP-0008) does not identify enforcement of NOx and PM controls.*

- NHDES Response: PSNH Merrimack Station Units MK1 and MK2 will be subject to SO_2, NOx, and PM emission limitations specified in its Title V operating permit (TV-0055; Attachment HH). Similarly, PSNH Newington Station Unit NT1 will be subject to SO_2, NOx, and PM emission limitations specified in its Title V operating permit (TV-OP-054; Attachment II). Units MK2 and NT1 must also meet the enforceable BART provisions described in Tables 9-6 and 9-7, added to Section 9 of the SIP. These tables include references to proposed rulemaking Chapter Env-A 2300 Mitigation of Regional Haze (Attachment GG). Also, stricter fuel sulfur standards developed as part of the MANE-VU Ask have been incorporated into proposed revisions to Env-A 1604 Sulfur Content Limitations for Liquid Fuels (Attachment FF).

Public Service of New Hampshire

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The Northeast Utilities System

April 22, 2010

Mr. Craig A. Wright, Assistant Director
Air Resources Division
NH Dept. of Environmental Services
29 Hazen Drive, PO Box 95
Concord, NH 03302-0095

Re: Regional Haze Draft Rule

Dear Mr. Wright:

Public Service Company of New Hampshire (PSNH) appreciates the opportunity to provide comments on the draft rule on Regional Haze, Env-A 2300. Given the impact to Merrimack Unit #2 (MK2) and Newington Unit #1 (NT1), its two largest fossil-fired electric generating units, the implementation of Regional Haze and Best Available Control Technology requirements is a very important matter for PSNH.

As requested in your letter to William H. Smagula, dated March 25, 2010, PSNH is providing the following comments on the draft rule.

<u>Applicability: Env-A 2301.02</u>
The applicability of Chapter Env-A 2301 should only include those units identified as BART eligible units in 40 CFR 51 Subpart P (See definitions of BART-eligible source and Existing Station facility in 40 CFR 51.301.) PSNH requests that Env-A 2301.02 be revised to specifically identify MK2 and NT1 as applicable units. Consistent with the applicability of 40 CFR 51 Subpart P, PSNH also requests that Env-A 2302.01(a) be removed.

<u>Emission Standards Applicable to Cyclone-Firing, Wet-Bottom Boilers: Env-A 2302.01(b)</u>
PSNH requests that Env-A 2302.01(b) be revised and clarified to refer specifically to MK2 rather than boiler type. PSNH also requests that the rule contain the emissions rates that will apply. Lastly, PSNH requests that the averaging time associated with the NOx emission rate is quarterly, rather than monthly, in order to allow the necessary flexibility to accommodate unit start-ups and shut-downs.

PSNH suggests the following language:

(b) For Merrimack Unit #2, the following emission rates shall apply beginning on July 1, 2013:

(1) SO2 emissions shall be controlled to 10 percent of the uncontrolled SO2 emission rate (90 percent SO2 removal). Compliance with this percent reduction shall be determined on a calendar month average by comparing the SO2 emission rates as measured by CEMS on the inlet and outlet of the FGD system;

(2) NOx emissions shall not exceed 0.37 lb/mmBTU. Compliance with this emission rate shall be demonstrated on a quarterly average as determined by CEMS on the outlet of the FGD system; and

(3) TSP emissions shall not exceed 0.08 lb/mmBtu. Compliance with this emission rate shall be demonstrated by conducting periodic stack tests, as specified in Env-A 2304.01(b), to measure emissions on the outlet of the FGD system.

Emission Standards Applicable to Tangential-Firing, Dry-Bottom Boilers: Env-A 2302.02
Similar to the above comment relative to emission rates for MK2, PSNH requests that Env-A 2302.02 be clarified and revised to refer specifically to NT1 and contain the NOx and TSP emission rates that will apply. With regard to the SO2 emission rate, although PSNH appreciates a lb/mmBtu emission rate rather than a percent sulfur requirement, PSNH believes that 0.50 lb/mmBtu is unnecessarily aggressive and will not result in visibility improvements that warrant the additional costs to PSNH customers.

Continuous Emissions Monitoring Systems: Env-A 2303 and Performance Testing: Env-A 2304
PSNH understands that emissions monitoring, either continuously with CEMs or periodic with stack testing, is required in order to demonstrate compliance with the emission rates contained in the rule. PSNH currently monitors SO2 and NOx emissions at Merrimack and Newington Stations continuously using CEMS which eliminates the need to conduct periodic performance testing for emissions. The performance testing requirements contained in Env-A 2304.01(a) and Env-A 2304.02(a) are redundant. With regard to the periodic stack test requirement for TSP at Merrimack Station, contained in Env-A 2304.01(b), PSNH requests that the deadlines be revised to require completion of testing by December 1st in order accommodate planned maintenance outage schedules.

In order to simplify the rule and clarify the emissions monitoring requirements, PSNH suggests Part 2303 and Part 2304 are combined into a single part and the periodic stack testing requirements are revised as follows:

(a) Periodic stack tests shall be conducted, in accordance with Env-A 802, to demonstrate compliance with the TSP emission rates contained in Env-A 2302 as follows:

    (1) For MK2, when operating alone or with MK1 with combined emissions being discharged from a single stack:
        a. beginning in 2013, annually, with the initial stack test to be completed no later than December 1, 2013; and
        b. beginning in 2015, every other year, with the fourth stack test to be completed no later than December 1, 2015.
    (2) For NT1,
        a. at least every 5 years and/or upon request by DES and/or EPA.

PSNH would be happy to meet with you and your staff to discuss the comments and concerns expressed above. If you have questions or require additional information, please contact me at 634-2440 or Laurel Brown, Senior Environmental Analyst, at 634-2331.

Sincerely,

Elizabeth H. Tillotson

Elizabeth H. Tillotson
Technical Business Manager – Generation

cc: Karla McManus, DES

LAW OFFICES
ARTHUR B. CUNNINGHAM
79 Checkerberry Lane, Hopkinton, NH 03229

November 22, 2010

Robert R. Scott, Director
Air Resources Division
New Hampshire Department of Environmental Services
79 Hazen Drive, PO Box 95
Concord, NH 03302-0095

Hand Delivered

Re: Proposed Rule, Chapter Env-A 2300, Mitigation of Regional Haze

Dear Mr. Scott:

I represent the New Hampshire Sierra Club [NHSC].

First, I want to thank you and Craig Wright for extending the time in which to submit comments on Proposed Rule Chapter Env-A 2300 and for the prompt rejection of the Public Service Company of New Hampshire [PSNH] confidentiality claims regarding information critical to the assessment of the rule. NHSC has long believed that PSNH uses the claim of confidential business information [CBI] as an artifice to conceal facts regarding compliance with the Clean Air Act and the New Hampshire Multiple Pollutant Control Program. I also want to thank Liz Knowland and Pete Demas for their help and cooperation in my substantial 91A document review of the Regional Haze documents.

You have determined that the July 17, 1998, NOx RACT Order for Merrimack Station MK2 satisfies the Regional Haze BART requirement. The 1998 NOx RACT Order requires that MK2 emit no more than 15.4 ton s of NOx per each 24 hour calendar day. In the BART analysis, 15.4 tons per day equates to 0.37lbs/MMBtu of NOx.

NHSC rejects your determination that the MK2 RACT Order satisfies BART.[1]

[1] .37 lbs/MMBtu is almost four times the presumptive .1lbs/MMBtu BART emission limit set forth in 40 CFR 51, Appendix Y.

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gilfavor@comcast.net

New Hampshire Department of Environmental Services-Air Resources Division [ARD] review of the Regional Haze BART requirement for Merrimack Station intersects with the legal necessity of ARD review of the New Hampshire nonattainment program, particularly for NOx, a major component of both regional haze and ozone.

ARD is required by the Clean Air Act to timely establish a NOx emission limit for Merrimack Station MK2 that satisfies both the Regional Haze BART requirement and the nonattainment program. New Hampshire is delinquent in the establishment of both programs.

The New Hampshire Regional Haze state implementation plan [SIP] was due to the United States Environmental Protection Agency [EPA] on December 17, 2007. On January 15, 2009, EPA made a finding that New Hampshire failed to timely submit addressing Regional Haze in mandatory class I federal areas [the nations National Parks and wilderness areas]. By January 15, 2011, EPA is required to fully approve the New Hampshire Regional Haze SIP or promulgate a federal implementation plan [FIP]. Exhibit 1.

On March 17, 2008, EPA issued a finding that New Hampshire missed the Clean Air Act deadline for submitting complete plans showing how the state will meet the 1997 ozone standards which must include an attainment demonstration, a reasonable progress plan, and, a reasonably available control technology plan.[RACT]. Exhibit 2. On January 19, 2010, EPA determined that the states must submit their attainment designations to EPA by January 7, 2011, for the primary ozone standard [1 hour], and August 31, 2011, for the secondary standard [8 hour]. Federal Register, Vol. 75, No. 11, January 19, 2010.

As you know, a large part of southern New Hampshire has not attained the NAAQS for ozone and a substantial portion of the nonattainment area is in serious nonattainment. The ozone NAAQS are required to provide protection of the public health against an array of ozone related adverse health effects that range from decreased lung function and respiratory symptoms to serious indicators of respiratory morbidity including emergency room visits and hospital admissions for respiratory causes; cardiovascular related morbidity and cardiopulmonary mortality.

The Merrimack Station MK2 emission limit for NOx to achieve attainment will be significantly more stringent than the July 17, 1998, NOx RACT Order:

1. PSNH has increased the historic net generating capacity of MK2 from 320 MW to an ISO NE capacity claim of 338 MW. PSNH is currently operating MK2 at 332 MW. Exhibit 3. NHSC rejects the PSNH claim that the generation upgrade is entirely due to increased efficiency of the replaced MK2 turbine.[2] ARD has failed to examine this generation upgrade and its impact on emissions.

2. NOx is a particularly demanding problem for MK2. The uncontrolled NOx levels are 2.4 lbs/MMBtu [average] and 2.66 lbs/MMBtu [maximum] which is a much higher emission rate than most uncontrolled boilers and is higher than most other cyclone boilers. The high emission rate is due to the very high heat release for the boiler. Exhibit 4.

3. The MK2 SCR cannot be operated fulltime because of a temperature permissive. During start-ups, shutdowns and low load operations [below 230 MW net] the SCR cannot operate. Exhibit 5. PSNH asserts that the uncontrolled NOx rate is typically 1.0-1.5 lbs/MMBtu. PSNH, because of these concerns, insists that it needs "flexibility" to operate the SCR at a much higher emission limitation.[3] Existing ARD data does not support the PSNH claim that MK2 emits only 1.0-1.5 lbs/MMBtu during low load operations with the SCR shut down. ARD must examine the integrity of the PSNH low load emission claim because it is a critical part of the BART emission calculation as it exists in the proposed Regional Haze SIP. See PSNH MK2 NOx Control Cost Analysis, Exhibit 6. ARD must fix a NOx emission limit that fully accounts for the periods when the SCR is not in operation.

The MK2 NOx emissions problem must be addressed in both the Regional Haze program and the nonattainment program. It makes no sense whatever to fix a 0.37 lbs/MMBtu BART emission limit for NOx knowing that a more stringent attainment NOx limit is due.

PSNH, in its confidential submissions to ARD ordered released by ARD, asserts that it will be too expensive [$10,169 per ton at 0.34 lbs/MMBtu] if it cannot maintain the de-rate flexibility at 0.37 lbs/MMBtu. Exhibit 7. If the

[2] NHSC has appeals pending before the NHDES-ARC that raise substantial NSR permitting issues. [09-10 ARC and 10-06 ARC]. Proper NSR permitting for the major plant modifications, including the replaced MK2 HP/IP turbine and related plant projects, will require significantly more stringent NOx emission limits. The lowest achievable emission rate [LAER] is required for modified sources in nonattainment areas.

[3] Data contained in ARD files indicate that MK2 NOx removal is, on average, below the .37 lbs/MMBtu NOx RACT limit.

PSNH cost claims are correct, PSNH will not be able to meet its Clean Air Act obligations under the secondary standard attainment program.

NHSC strongly urges ARD to establish an emission limit for MK2 in the Regional Haze SIP that will bring New Hampshire into attainment for ozone as required by the Clean Air Act.

Very truly yours,

Arthur B. Cunningham
Attorney for New Hampshire Sierra Club

Electronic copies to:

Catherine M. Corkery, Chapter Director, NHSC
Jerry Curran, Chapter Chair, NHSC
Donald Dahl, EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE SUITE 100
BOSTON MA 02109-3912

NHSC J 1

FEB 2 ᴶ 2010

Thomas S. Burack, Commissioner
New Hampshire Department of Environmental Services
29 Hazen Drive, PO Box 95
Concord, NH 03302-0095

Re: New Hampshire's Regional Haze State Implementation Plan

Dear Commissioner Burack:

As you know, on January 15, 2009, the Environmental Protection Agency (EPA) made a finding that the state of New Hampshire failed to submit a state implementation plan (SIP) addressing Regional Haze in mandatory class I Federal areas (our Nation's National Parks and wilderness areas) as required by the Clean Air Act (CAA) and federal regulations. The Regional Haze SIP was due to EPA by December 17, 2007. As a result of this finding, EPA must within two years (that is, by January 15, 2011) either fully approve New Hampshire's Regional Haze SIP or promulgate a federal implementation plan (FIP).

On January 29, 2010, the New Hampshire Department of Environmental Services (DES) submitted a final Regional Haze SIP to EPA. We have reviewed New Hampshire's submittal and note that it appropriately addresses many of the necessary components of a Regional Haze SIP. The plan is, however, incomplete with respect to best available retrofit technology (BART) requirements. Consequently, the BART portion of the submittal can not be processed as a revision to the New Hampshire SIP and EPA is returning that portion of the submittal to the DES. Therefore, the incomplete BART portion is no longer pending EPA action.

Specifically, in order for EPA to determine a SIP revision complete, it must include the necessary administrative and technical support materials to meet the criteria outlined in 40 CFR Part 51, Appendix V. New Hampshire's January 29, 2010 Regional Haze SIP submittal does not meet these criteria with respect to BART requirements. In particular, the SIP submittal lacks enforceable emission limitations, work practice standards and recordkeeping/reporting requirements, to ensure BART requirements are implemented.

In addition, EPA is very concerned with the BART rulemaking schedule outlined in the SIP submittal. This schedule calls for a rough draft of the BART rule in January 2012 and a final rule to be adopted in May 2013. As noted above, EPA's deadline to issue a FIP is January 15, 2011.

Also, New Hampshire has not yet submitted an adopted regulation implementing the state's low sulfur fuel oil measure which was included as an element of New Hampshire's long term Regional Haze strategy.

EXHIBIT /

Therefore, we would like to request a meeting with your Air Director and staff working on the Regional Haze SIP to further discuss this issue, in order to ensure these requirements are met in a timely and effective manner.

My staff will contact DES staff to schedule a mutually acceptable time for this meeting. If you or your staff have any questions on Regional Haze issues, please contact Anne McWilliams at 617-918-1697.

Sincerely,

Stephen S. Perkins, Director
Office of Ecosystems Protection

cc Robert R. Scott, NH DES
Jeff Underhill, NH DES
Charles Martone, NH DES

http://www.epa.gov/glo/fs20080317.html
Last updated on Friday, May 09, 2008

Ground-level Ozone

You are here: EPA Home Air & Radiation Six Common Pollutants Ground-level Ozone Fact Sheet

Fact Sheet - Managing Ozone Air Quality: Findings on Failure to Submit Elements of 1997 Ozone NAAQS State Implementation Plan

ACTION

- On March 17, 2008, the U.S. Environmental Protection Agency (EPA) issued findings that 11 states missed Clean Air Act deadlines for submitting elements of their State Implementation Plans (SIPs). The deadlines are for submitting complete plans showing how they will meet the 1997 ozone standards; they are not deadlines for meeting those standards.

- These elements are an attainment demonstration, a reasonable further progress plan, and a reasonably available control technology plan.

- Today, EPA has taken a separate action that helps ensure that all states have in place the basic program requirements for attaining the 1997 ozone air standards; For more information please see www.epa.gov/air/ozonepollution/fs20080317b.html.

- The 11 states are: California, New Hampshire, New York, Rhode Island, Illinois, Indiana, Maine, Ohio, Vermont, Virginia, and Wisconsin. (See attached for a list of specific overdue elements.)

- The plans that were due are known as state implementation plans, or SIPs, and are required by States in one or more of the following situations:
  - States with ozone nonattainment areas: these areas must submit SIPs to show how those areas will meet the ozone standard by their attainment dates.
  - States in the Ozone Transport Region (OTR): the Clean Air Act set out specific requirements for a group of northeast states that make up the OTR. States in this region are required to submit a SIP and install a certain level of controls for the pollutants that form ozone, even if they meet the ozone standards.

- For ozone nonattainment areas, the Clean Air Act requires EPA to start three timetables, known as "clocks" once these findings are published in the Federal Register. The three clocks include two sanctions clocks, and a deadline for EPA to issue federal implementation plans (FIPs). These clocks range from 18 months to two years.

- For areas currently attaining the standard, but falling within the Ozone Transport Region, this finding of failure to submit starts the emission offset sanction clock and the FIP clock. Because these areas are attaining the 1997 ozone standard, this finding does not start the highway fund sanction clock.

- Sanctions will not apply to states that submit complete SIPs before these clocks run out and EPA will not issue FIPs for states with plans approved before the FIP deadline. EPA is working with these states to ensure that they submit revised, approvable plans as soon as possible.

EXHIBIT 2

- EPA has proposed a clean air determination for New York and finalized a clean air determination for New Hampshire. These determinations, when finalized, will suspend certain SIP requirements and any active sanction clocks as long as the areas maintain clean air.

The Clocks

- **Emission offset sanctions (18 months)**: Under emission offset sanctions, a state must ensure that each ton of emissions created by a new stationary source of pollution is offset by a two ton reduction in existing stationary sources. These offset requirements would apply in areas designated as "nonattainment" for the ozone standard. Emission offset sanctions will not apply to states that submit complete SIPs within 18 months after these findings are published in the Federal Register.
- **Highway fund sanctions (two years)**: Under highway fund sanctions, a state can lose funding for transportation projects if the funds have not been obligated by the Federal Highway Administration by the date the highway sanctions are imposed. (Projects that have already received approval to proceed and had funds obligated may proceed.) Highway sanctions will not apply to states that submit complete SIPs within 24 months of publication of these findings.
- **Federal Implementation Plans (two years)**: Under a FIP, EPA, not the state, determines what steps must be taken to meet the standard. For the FIP clock to be turned off, EPA must approve the SIPs within 24 months of publication of these findings.

BACKGROUND

- Ground-level ozone forms when emissions of nitrogen oxides (NOx) and volatile organic compounds (VOCs) "cook" in the sun. Ozone exposure is linked to acute respiratory problems, aggravated asthma, reduced lung capacity, inflamed lung tissue, and impairment of the body's immune system.
- SIPs include a number of documents and programs designed to address ground level ozone pollution. These findings apply to three plan elements: an attainment demonstration, the Reasonably Available Control Technology (RACT) elements and the Reasonable Further Progress (RFP) element.

  Attainment demonstration

  - States with nonattainment areas are required to analyze the potential of those areas to meet the 1997 ozone standard. The state uses air quality models and other relevant technical information to demonstrate its ability to achieve the air quality standard by a certain date. (In the findings issued March 17, 2008, states with ozone nonattainment areas classified as moderate or higher are required to show they can meet the standard "as expeditiously as practicable," but no later than the statutory attainment date for the respective classification. These attainment demonstrations were due to EPA in June 2007.)

  Reasonably Available Control Technology

  - The Reasonably Available Control Technology (RACT) SIP element identifies certain levels of air pollution control for existing stationary sources of NOx and VOCs. RACT is defined as the lowest emissions limitation that a particular emissions source is capable of meeting with control technology that is reasonably available, considering technological and economic feasibility. The RACT requirement also applies to all areas in the Ozone Transport Region, regardless of the area's designation for the 1997 ozone standard. This SIP element was due to EPA in September 2006.

Reasonable Further Progress

- SIPs must also provide for steady progress, also known as Reasonable Further Progress (RFP), toward attainment of the ozone standard. This provides a way to ensure states make continual progress toward meeting the standard by their attainment date. This SIP element, which was due in June 2007, establishes emission reduction milestones for the first six years after a baseline year (in most cases, the baseline is 2002), and every three years afterward until the attainment year.

- States that are part of the Ozone Transport Region were required to submit SIPs to meet the 1997 ozone Reasonably Available Control Technology (RACT) requirement for the entire State. The RACT requirement applies to all areas within the Ozone Transport Region, regardless of the area's designation for the 1997 ozone standard.

- The states in the Ozone Transport Region are: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, and the Washington, D.C. Metropolitan Statistical Area, including the northern Virginia suburbs.

FOR MORE INFORMATION

- To download a copy of this notice, please go to www.epa.gov/air/ozonepollution/ and click on "Regulatory Actions." For further information concerning this action, contact Mr. Butch Stackhouse of EPA's Office of Air Quality Planning and Standards at (919) 541-5208 or by email at stackhouse.butch@epa.gov.

States and Areas Receiving Findings of Failure to Submit

State	Affected Area(s)	SIP Element(s) Not Submitted
California	W Mojave Desert	Reasonable Further Progress SIP
	Sacramento Metro Area	Reasonable Further Progress SIP
	Ventura County (part) Area	Reasonable Further Progress SIP
New Hampshire	Boston-Manchester-Portsmouth (SE)	Attainment Demonstration Reasonable Further Progress SIP
New York	Jefferson County Area	Attainment Demonstration Reasonable Further Progress SIP
Rhode Island	Providence (all of RI) Area	Attainment Demonstration RACT SIPs Reasonable Further Progress SIP
Illinois	Chicago-Gary-Lake County Area	Attainment Demonstration RACT SIPs Reasonable Further Progress SIP
	St. Louis Area	NOx RACT
Indiana	Chicago-Gary-Lake County Area	Attainment Demonstration RACT SIPs

		Reasonable Further Progress SIP
Maine	Entire State in Ozone Transport Region (OTR)	VOC RACT SIP
	Entire State minus areas receiving NOx waiver	NOx RACT SIP
Ohio	Cleveland-Akron-Lorain Area	VOC RACT SIP
Vermont	Entire State in Ozone Transport Region	NOx and VOC RACT SIPs
Virginia	Stafford County Portion of the OTR	NOx and VOC RACT SIPs
Wisconsin	Milwaukee-Racine Area	Attainment Demonstration Reasonable Further Progress SIP
	Sheboygan Area	Attainment Demonstration Reasonable Further Progress SIP

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request SCNH-02

Dated: 08/13/2010
Q-SCNH-004
Page 1 of 1

Witness: William H. Smagula
Request from: Sierra Club, New Hampshire Chapter

Question:
William H. Smagula, Director-Generation, PSNH, in response to Q-Staff-059, listed a number of projects that improved the fossil unit heat rates, including the HP/IP turbine project. In response to Q-Staff-022, Mr. Smagula stated that the net energy of 12 MW was due to equipment gains. Mr. Smagula also stated that an additional unit capacity of just over 5 MW was demonstrated. He did not attribute the 5MW+ increase to efficiency gains. Please provide the documentation that supports Mr. Smagula's responses, both as to the efficiency gains and the additional unit capacity.

Response:
Merrimack Unit 2 receives capacity credit for 338 MW associated with the turbine project efficiency gains as shown on the ISO web page.

The unit operates at approximately 332 MW (12 MW above the previous 320 MW net operation) due to efficiency gains associated with the turbine project as shown below.

Historical operation at 320 MW			Increased output at 332 MW (Improved turbine efficiency)		
date	hour	Net Gen MW	date	hour	Net Gen MW
01 Jan 10	01	321.15	06 Jan 10	13	332.35
01 Jan 10	02	320.95	06 Jan 10	14	332.25
01 Jan 10	03	320.60	06 Jan 10	15	331.65
01 Jan 10	04	320.70	06 Jan 10	16	332.90
01 Jan 10	05	320.70	06 Jan 10	17	333.10
01 Jan 10	06	320.50	06 Jan 10	18	331.95
01 Jan 10	07	320.60	06 Jan 10	19	332.15
01 Jan 10	08	320.55	06 Jan 10	20	331.85
01 Jan 10	09	320.85	06 Jan 10	21	331.40
01 Jan 10	10	320.90	06 Jan 10	22	331.20
01 Jan 10	11	321.00	06 Jan 10	23	331.60
01 Jan 10	12	320.70	06 Jan 10	24	332.20

EXHIBIT 3

NHSC B.11

Andover Technology Partners

Recipient: Mr. Andy Bodnarik

Company: NH DES

Fax Number: 1 (603) 271-7053

Voice Number: 1 (603) 271-1370

Sent By: James E. Staudt

Company: Andover Technology Partners

Fax Number: 1-978-683-3843

Voice Number: 1-978-683-9599

Date: 4/23/98

Time: 6:39:41 AM

Total No. Pages: 6

Subject: MK-2 Case Study

Message:

Attached is case study that was prepared originally with a great deal of Jim Philbrick's help but was later modified based on comments by NH DES.

It is crucial that this have final blessing from PSNH. WITHOUT PSNH's APPROVAL, MK-2 AND MK-1 CASE STUDIES WILL NOT BE INCLUDED IN FINAL REPORT.

This is the last, remaining item keeping report from being released. I will be very grateful for your help on this matter.

Thank you,

Jim Staudt

EXHIBIT 4

Section 4.2 SCR Case Studies

4.2.1 Case Study SCR-1: Merrimack #2 - Selective Catalytic Reduction

Operator Contact - Mr. Jim Philbrick: (~~620~~ 603) 634-2280

Background

Merrimack #2 is a 333 MWg (320 MW net) wet bottom, bituminous coal-fired, cyclone boiler operated by Public Service Company of New Hampshire (PSNH) that is located in Bow, NH. The boiler, built in 1968 (installed in 1969), generates 2300 Klbs/hr of steam with 3473 MMBTU/hr heat input at maximum capacity. The 1997 capacity factor of the unit was 80% (no annual outage) and the historical (1990) capacity factor was 67% (includes annual outage). The facility was subject to NOx RACT in 1995. Uncontrolled NOx levels were 2.4 lb/MMBTU (average) or 2.66 lb/MMBTU (maximum), which is a much higher emission rate than most uncontrolled boilers and is higher than most other cyclones. This high uncontrolled NOx emission rate is due, in large part, to the very high heat release rate for this boiler which is manifested in very high full load furnace exit gas temperatures of about 2450 F. The historical coal used is 2.5% sulfur eastern bituminous, and the boiler is equipped with a tubular air preheater. However, to reduce SO_2 emissions in 1995 the sulfur content of the coal was reduced to 1.5%. Typically, 100% of the fly ash is reinjected.

The state of New Hampshire determined that 1995 NOx RACT for PSNH would be a maximum average NOx emission rate for a 24 hour calendar day of 1.4 lb/MMBTU with a daily maximum NOx emission of 35.4 tons per day, which is equivalent to 0.85 lb/MMBTU at full load for 24 hours. Hence, if continuous, 24-hour operation at full load was desired, a NOx reduction system capable of providing 68% reduction at full load was necessary. Future reductions will be required in 1999 to reduce total NOx emissions of 15.4 TPD, which is equivalent to less than 0.40 lb/MMBTU at full load or an 85% reduction from the original uncontrolled peak daily baseline.

Technology Selection

PSNH initially planned to use Selective Non-Catalytic Reduction on Merrimack #2 for NOx RACT compliance. SCR had previously been ruled out based upon the information that PSNH staff had at the time, which suggested that SCR would not be a technically viable option for Merrimack #2. Use of SNCR would require derating of the unit by over 50 MW since the furnace temperatures were too high at full load for the SNCR process to be effective. SNCR alone could not provide sufficient reductions for 1999 compliance. Reductions in 1999 would have to be achieved through some additional or other means. Initially, PSNH personnel did not believe SCR to be a technically or economically feasible retrofit option on a wet-bottom, bituminous coal-fired cyclone unit because of the large capital investment and the potential catalyst poison implications associated with fly ash reinjection.

PSNH received multiple bids for SNCR systems on Merrimack #2. None of the bidders were comfortable about installing an SNCR system on MK-2 and two of the bidders strongly suggested that SCR be considered. SCR would enable the unit to operate at full load (no derating) and would use the reagent much more efficiently. Moreover, the SCR would be able to provide sufficient reduction for the likely future NOx reductions in 1999. The catalyst suppliers assured PSNH that arsenic could be addressed, and firm guarantees would be provided for a cyclone unit. With the understanding that the SCR system would entail a much higher capital cost than SNCR, the benefits of using SCR were sufficiently compelling that PSNH decided to request proposals from multiple SCR vendors.

SCR proposals were received and PSNH found the vendors provided strong guarantees on performance and lower capital costs than were originally expected. Based upon their review of the proposals and a detailed economic/technical evaluation between SNCR and SCR systems, PSNH selected Noell as the contractor for an SCR system.

Technical Design Challenges

Several features of the facility contributed to the difficulty of the retrofit.

- The very high NOx level requires that the reactor, and ammonia handling equipment be much larger than would typically be expected for a boiler this size.
- Fly ash from the precipitator is reinjected back into the boiler, which can have the potential for shortening catalyst life. This was factored into the catalyst design.
- The large catalyst size and high sulfur content of the fuel contribute to challenges in controlling SO_2 to SO_3 oxidation to low levels.
- There were only 22 linear feet of distance between the bottom tubes of the economizer and the top tubes of the tubular air heater, providing very little room for ductwork to/from the SCR.
- The boiler is equipped with a tubular air preheater, which is not easily water washed or cleaned with soot blowers. Hence, formation of ammonium bisulfate caused by the presence of ammonia and SO_3 is a major concern.
- To limit the additional pressure drop to within the available margin in the forced draft fans, the SCR ductwork was designed for relatively low pressure drop and as a result the ductwork is relatively large.
- The new ductwork within the boiler area was supported from the existing structural steel. This steel had to be analyzed and reinforced.
- The boiler feed line to the economizer interfered with the SCR ductwork and had to be rerouted. This is high-pressure, fabricated pipe.

Fortunately, the space to place the SCR reactor was readily available with little demolition required.

The project had to face the challenges of a very fast schedule - approximately eleven months from placing the order to completion of commissioning. This fast schedule did not offer any slack time. The boiler had to be in compliance with the new, lower emission rate on the date of start up. An accelerated schedule was required for all phases of the project in order to satisfy the NOx compliance deadline. Also, the construction portion of the project was performed during a New Hampshire winter.

Merrimack #1	
MWgr	333
Klbs stm/hr	2,300
MMBTU/hr	3,473
1997 Cap. Factor	0.80
Hist. Cap. Factor (1990)	0.67
Boiler age (yrs)	28
Boiler type	Cyclone
Air heater	Tubular
Primary Fuel	coal, 1.5% S
Baseline NOx	2.4 (avg), 2.66 (max) lb/MMBTU
Controlled NOx	<0.85 lb/MMBTU

Project Execution

As mentioned, project execution was carried out by PSNH and the contractor, with construction during the winter. The excavation and foundation work was done during the fall and all above groundwork was done during the winter. The schedule was maintained by establishing good coordination with all contractors and working extended hours.

The reactor was designed to accept up to four layers of catalyst. Initial catalyst charge was two layers of 200 m^3 each, for a total of 400 m^3 of catalyst. Each layer is equipped with soot blowers to blow dust off the catalyst. An additional ½ layer was planned for addition and installed in 1997 and 1 ½ layers are planned to be added in 1999 when regulations require further NOx reductions.

A permit limit to ammonia consumption?

The system typically uses anhydrous ammonia reagent at a rate of approximately 1,900 lb/hr at full load, which is equivalent to a permit limit of 38 lb/hr as NH_3. This unusually high amount of reagent is needed due to the unit's relatively high baseline NOx emissions. The anhydrous ammonia is mixed with warm air carrier (from the air preheater) and supplied through two 90-degree grids in the ductwork upstream of the SCR.

The design and routing of ductwork was a major challenge. PSNH decided to use a large single duct at the exit of the economizer to route the flue gas to the SCR and a split to two ducts to go back to the air heater. This enabled a more balanced flow distribution out of the economizer and back to the air heater.

The project was completed on time, despite the extremely fast time frame and the difficult challenges of the program. Although there are aspects of SCR retrofits that can be more difficult than those encountered in the Merrimack #2 case, this project was a very challenging retrofit for several reasons outlined above. The total capital cost of the program, including the initial catalyst charge, was $18.4 million, or approximately 55/KW. For an 85% NOx reduction the capital cost (which includes the cost of the additional two layers of catalyst and associated equipment) is approximately $72/KW.

Experience

Since start up over two years ago, performance of the SCR system has matched anticipated performance. Catalyst samples have been tested periodically and samples are demonstrating the expected activity associated with the catalyst age. The major design parameters of the SCR catalyst initially appear to satisfy the guarantee levels.

To date, the only aspect of the SCR system that has caused any difficulty is failure of certain auxiliary mechanical equipment. These failures have included an SCR bypass damper that does not consistently provide a tight shut off, duct work casing leaks (pressurized unit and large ductwork) and failed expansion joints. The most significant concern has been the SCR bypass damper, located downstream from the ammonia injection grid, that has not consistently provided a tight shut off and produces high ammonia concentration (over 5 ppm at times) at the air heater inlet during operation. Since the boiler fires medium to high sulfur coal, 1.5% S, this results in a slow build up of ammonium bisulfate in the air heater and ultimately increased pressure drop across the air preheater. Precautions associated with increasing air heater outlet temperature have localized the buildup somewhat. However, the air heater still needs to be water washed on occasion. Notably, the SCR reactor, associated auxiliary equipment and the control system have not been the cause on an unscheduled outage to date, with the exception of the failed expansion joints. Additional water washings of the air heater have been timed to be done simultaneously with boiler outage work. Also, it has never been necessary to reduce boiler load to maintain environmental compliance because of an SCR system problem. There have been three forced outages because of premature expansion joint failures. Because of the extensive ductwork required to route the flue gas to and from the reactor, 11 expansion joints were installed in the system. PSNH and Noell are currently working on a correction to the bypass damper, which should reduce the frequency of air heater washes.

Fly ash quality has not been adversely impacted by the addition of the SCR system. All of the fly ash and boiler slag is beneficially utilized.

Operating costs have been determined by PSNH to be approximately $2,000,000/year. This estimate includes: ammonia, parasitic loads, maintenance, cost of air heater washes, boiler efficiency loss due to elevated exit temperature, the cost of catalyst testing, and engineering support. After the bypass damper is fixed, this number should decrease by approximately 10-15% because the reduced ammonia in the air heater will reduce the need to elevate air heater outlet temperature and the frequency of water washing.

Cost Effectiveness

PSNH has performed a detailed cost analysis for the use of SCR technology on Merrimack Station Unit #2. The analysis is based on a 65% NOx reduction with two full layers of catalyst and is given in 1996 dollars. The cost is $400 per ton of NOx removed. The cost components I this analysis include operation and maintenance (both fixed and variable), depreciation and the cost of money.

A detailed analysis for 1999 with 4 full layers of catalyst in the reactor and the reactor working at its maximum design capacity has not been completed at this time.

Merrimack #2	
Contract duration - Order placed to commencement of operations	~11 months
Months SCR operation (Nov. '97)	~40 months
# forced outage incidents	3
NH_3 slip, ppm	<5
NH_3 plume/year	0
Outages or reductions in capacity due to air heater plugging	0
Capital Cost	~$55/KW
Cost Effectiveness	~$400/ton NOx removed

Public Service of New Hampshire

PSNH Energy Park
780 North Commercial Street, Manchester, NH 03101

Public Service Company of New Hampshire
P.O. Box 330
Manchester, NH 03105-0330
(603) 634-2236
Fax (603) 634-2213
macdojm@psnh.com

The Northeast Utilities System

John M. MacDonald
Vice President - Generation

December 4, 2009

RECEIVED
NEW HAMPSHIRE

DEC 07 2009

AIR RESOURCES DIVISION

NHSC B.17

Mr. Robert R. Scott, Director
Air Resources Division
Dept. of Environmental Services
29 Hazen Drive, PO Box 95
Concord, NH 03302-0095

Public Service Company of New Hampshire
Request for Additional Information for Determination of
Best Available Retrofit Technology (BART) for the NH Regional Haze SIP

Dear Mr. Scott:

In response to your request, dated November 17, 2009, for additional information necessary to finalize the NH Department of Environmental Services, Air Resources Division's response to comments received from the U.S. Environmental Protection Agency and Federal Land Managers specific to DES' Best Available Retrofit Technology (BART) demonstration, Public Service Company of New Hampshire is submitting the enclosed information.

As you know, PSNH did not submit written comments specific to DES' BART determination presented at the public hearing on June 24, 2009, because PSNH was in agreement with that determination. PSNH is interested in understanding the basis of any significant changes to the BART determination and would raise objection to overly stringent BART limits that provide minimal environmental benefit yet increase costs and expose PSNH's generating facilities to permit exceedances during the course of normal operation of the units.

<u>Incremental Cost Estimates of SO2 Reductions at Newington Unit NT1</u>

In order to estimate incremental costs associated with varying grades of oil, PSNH evaluated historical fuel cost data provided by Platts for the period of 2002 through September 2009. Considering the inevitable inaccuracies in trying to predict future fuel prices, PSNH has calculated incremental cost estimates for illustrative purposes using the more recent historical fuel cost data (2005-2009).

As illustrated on the enclosed spreadsheet, PSNH has estimated the incremental costs, on a dollar per ton basis, of sulfur dioxide reductions at Newington Station, Unit NT1 to be as follows:

2% sulfur content by weight to 1% sulfur content by weight	\$1,030 per ton SO2 reduced
1% sulfur content by weight to 0.7% sulfur content by weight	\$2,949 per ton SO2 reduced
0.7% sulfur content by weight to 0.5% sulfur content by weight	\$7,203 per ton SO2 reduced
0.5% sulfur content by weight to 0.3% sulfur content by weight	\$12,957 per ton SO2 reduced

EXHIBIT 5

Assumptions Used to Produce Estimated Incremental Costs

The assumptions used to estimate incremental costs include historical fuel prices, maximum gross heat input rate of Unit NT1, SO2 emission rates in lb/mmBtu and lb/hr for each grade of fuel, and tons of SO2 reduced. Capacity factor of Unit NT1 is not necessary to calculate incremental costs on a dollar per ton reduced basis. The SO2 emission rates were derived from the sulfur content of the fuel, the heating value of the fuel, and the maximum gross heat input rate of Unit NT1. The tons of SO2 reduced were calculated using the delta in SO2 emissions between each fuel type on a lb/hr basis which was calculated using the SO2 lb/mmBtu emission rate for each grade of fuel and the maximum gross heat input rate of Unit NT1 as contained in Newington Station's Title V Operating Permit, TV-OP-054.

Additional Costs Associated with Fuel Storage Upgrades at Newington Station

At the present time, PSNH is hopeful that the current fuel storage and delivery system, including configuration and storage capacity, is adequate to handle varying grades of oil if required in the future. As a result, PSNH has not calculated additional costs associated with fuel storage upgrades.

MK Unit #2 Boiler and SCR Operations

The SCR has a temperature permissive that must be met in order for the SCR to be put in service or kept in service. During start-ups, shut-downs, and low load operation of Merrimack Unit #2, the temperature is lower than that permissive temperature and the SCR cannot be operated. As an example, Merrimack Unit 2 typically has 10 to 15 outages per year, in addition to approximately 8 low load operating periods per year. The timing of these conditions is not predictable and this estimate of occurrences provided reflects historical performance. Examples of low load situations include, but are not limited to: forced and planned outage start ups and shutdowns, loss of one of any equipment pair where both pieces of equipment are necessary for full load operation and the loss of one results in half load operation (such as Forced Draft Fans, Condensate Pumps), loss of the Main Boiler Feed Pump, loss of coal feeders, condenser waterbox cleaning, etc. Any condition which requires the unit be at loads below 230 mw net, causing the temperature to be below the SCR permissive will result in the SCR not able to be put in service. This load point may increase with the new, more efficient HP/IP turbine.

In addition to boiler operations and load conditions that affect SCR operation, malfunctions of the SCR system and/or associated equipment can also affect the operation of the SCR. Malfunctions of the SCR system and/or associated equipment can result in partial or complete reduction of SCR performance.

As part of normal service, the SCR catalyst becomes coated with flyash. Blinding of the catalyst with flyash can cause the SCR process control settings (often referred to as the setpoint) to have to be increased (less NOx conversion), as the reagent distribution becomes less uniform and as less catalyst is exposed to the flue gas. The SCR is cleaned as needed during outages, and sootblowers are used on line.

Reagent injection grid nozzles, being in the flue gas path, can become fouled with deposits. This can affect reagent distribution, compounding the effect of a fouled catalyst, for example. The reagent injection grid is cleaned, as needed, during outages. Also, reagent delivery disruption can occur and on-site storage is limited.

Also as a catalyst ages, it becomes less reactive. This causes a reduction in ability for NOx conversion to take place. This in itself does not typically result in higher NOx emission because the SCR has four layers of catalyst, staggered in age. However, it will compound the effect of a fouled catalyst, for example.

The uncontrolled NOx rate at reduced load and during start ups and shut-downs is typically 1.0 - 1.5 lb NOx/mmBTU. The uncontrolled NOx rate at normal full load is as high as 2.66 lb NOx/mmBTU, with an average of 2.4 lb NOx/mmBTU.

The SCR is unable to perform continually at its maximum capability due to these concerns. As a result, PSNH needs flexibility to operate the SCR based on current operating conditions.

In closing, PSNH would like to reiterate its opinion that changes to DES' BART determination that result in more stringent emissions limitations create concerns relative to increased costs and decreased operational flexibility.

Please contact Laurel L. Brown, Senior Environmental Analyst – Generation, at 634-2331 if you would like additional information or would like to meet to discuss the enclosed information further.

Sincerely,

John M. MacDonald
Vice President – Generation

Enclosure

Assumptions Used to Calculate Incremental Cost Estimates*

(A) % sulfur	(B) SO2 lb/mmbtu	(C) Max Gross Heat Input mmbtu/hr	(D) SO2 lb/hr	(E) Reduction in SO2 lb/hr
2.0	2.288	4,350	9,952.8	
1.0	1.086	4,350	4,724.1	5,228.7
0.7	0.748	4,350	3,253.8	1,470.3
0.5	0.528	4,350	2,296.8	957.0
0.3	0.313	4,350	1,361.6	935.3

	increased cost/barrel		increased cost/hr		$/ton SO2
	low	high	low	high	Reduced
2% to 1%	0	$ 4.00	0	$ 2,692.86	$ 1,030
1% to 0.7%	$ 1.00	$ 3.30	$ 673.21	$ 2,167.75	$ 2,949
0.7% to 0.5%	$ 1.00	$ 2.20	$ 673.21	$ 3,446.86	$ 7,203
0.5% to 0.3%	$ 3.00	$ 9.00	$ 2,019.64	$ 6,058.93	$ 12,957

(A) % sulfur in the fuel oil

(B) SO2 lb/mmBtu emission rate, calculated based on %S and 153,846 btu/gal

(C) Maximum gross heat input rate from permit

(D) SO2 lb/hr emission rate, calculated = B * C

(E) Lbs of SO2 reduced per hour

	Actual Fuel Use	Historical Fuel Cost				
	#6 oil (barrels)	2%S oil ($/barrel)	1%S oil ($/barrel)	0.7%S oil ($/barrel)	0.5%S oil ($/barrel)	0.3%S oil ($/barrel)
2002	1,051,050	$ 21.20	$ 22.45	$ 23.26	$ 23.80	$ 25.25
2003	3,425,217	$ 24.95	$ 27.48	$ 29.26	$ 30.45	$ 32.63
2004	3,099,258	$ 25.25	$ 27.92	$ 30.04	$ 31.46	$ 34.53
2005	2,027,172	$ 37.00	$ 41.00	$ 44.00	$ 46.00	$ 50.10
2006	392,922	$ 45.50	$ 46.30	$ 48.46	$ 49.90	$ 54.12
2007	529,092	$ 53.70	$ 53.45	$ 56.54	$ 58.60	$ 62.86
2008	201,172	$ 75.25	$ 77.80	$ 81.10	$ 83.30	$ 92.16
2009	118,246	$ 49.90	$ 50.75	$ 51.98	$ 52.80	$ 55.83

Historical fuel cost data from Platts 2002-2009

2009 data includes costs through 9/09 only.

* Estimates calculated illustrate cost increases based on assumptions relied upon.

PSNH MK2
NOx Control Cost Analysis

CONFIDENTIAL
Released Nov 3, 2010 per letter to PSNH

Given:

Uncontrolled NOx emission rate at full load, average	2.4 lb/MMBtu
Uncontrolled NOx emission rate at full load, maximum	2.66 lb/MMBtu
NOx removal efficiency of existing SCR, average	> 0.86
Controlled NOx emission rate at full load, average	$(1 - 0.86) \times 2.4 = 0.34$ lb/MMBtu
Controlled NOx emission rate at full load, maximum	$(1 - 0.86) \times 2.66 = 0.37$ lb/MMBtu
Uncontrolled NOx emission rate at reduced load (during start-ups and shutdowns)	1.0 - 1.5 lb/MMBtu
Maximum effect of start-ups and shutdowns on 30-day average NOx emission rate, single event	0.04 lb/MMBtu
Maximum effect of start-ups and shutdowns on 30-day average NOx emission rate, multiple events	0.08 lb/MMBtu

Calculation of reduced-load time required to increase 30-day avg. NOx emission rate by 0.04 lb/MMBtu:

Assumptions: Controlled emission rate = 0.34 lb/MMBtu
Uncontrolled emission rate = 1.25 lb/MMBtu (midpoint of range)
30-day average emission rate after increase = 0.34 + 0.04 = 0.38 lb/MMBtu

Solve two equations in two unknowns:

$$0.34a + 1.25b = 0.38(100\%)$$
$$a + b = 100\%$$
$$a = 100\% - b$$
$$0.34(100\% - b) + 1.25b = 38\%$$
$$34\% - 0.34b + 1.25b = 38\%$$
$$0.91b = 4\%$$
$$b = 4.4\% \text{ of the time, or about 30 hours/month}$$

Calculation of estimated increase in annual maintenance costs to assure reduction in average NOx emission rate from 0.37 lb/ to 0.34 lb/MMBtu (Δ = -0.03 lb/MMBtu):

Assumptions: The essential costs are 1) the costs of additional scheduled outages for maintenance cleaning, 2) the costs of replacement power during those outages, and 3) the costs of accelerated replacement of catalyst to ensure performance.

Number of additional maintenance cleanings required = 2 (midpoint of range)
Additional annual cleaning cost = 2 x \$65,000/cleaning = \$130,000 (midpoint of range)
Duration of cleaning outage = 4.5 days per cleaning (midpoint of range)
Power replacement cost during maintenance outages ≈ \$30/MWh
Annual power replacement cost @ 2 cleaning outages/year = \$2,200,000
Annual cost of accelerated catalyst replacement = \$1,000,000

Total annual cost = \$130,000 + 2,200,000 + 1,000,000 = \$3,330,000
Annual heat input = 3,473 MMBtu/hr x 8,760 hr/yr = 30,423,000 MMBtu @ 100% capacity factor
Annual NOx benefit = 30,423,000 MMBtu/yr x 0.03 lb/MMBtu / 2,000 lb/ton = 456 tons removed*
Cost-effectiveness = \$3,330,000/456 = \$7,300/ton**

* This benefit is assumed constant, regardless of number and frequency of maintenance cleanings.

** The calculated cost-effectiveness could vary by about ±40% of the indicated cost per ton, based on the following: Cleaning costs could range from \$30,000-\$110,000 per cleaning, maintenance outages could be as few as 1 or as many as 4 per year and last 3-6 days each, and power replacement during outages could cost \$700,000-\$3,300,000 annually.

EXHIBIT 6

August 16, 2010

Released Per Nov 3, 2010 Letter to PSNH

CONFIDENTIAL BUSINESS INFORMATION

Public Service of New Hampshire
Best Available Retrofit Technology (BART)
Response to Request for Additional Information

SUPPLEMENTAL INFORMATION to PSNH's July 16 Letter, Response to Request for Additional Information re: BART

As requested, PSNH provides the following information to support the Merrimack Unit #2 (MK2) NOx limits for New Hampshire's Regional Haze SIP. We are providing this information as confidential business information since it contains various operating scenarios and financial costs which are competitively sensitive in nature and could be harmful if disclosed.

Merrimack Station Unit #2: Merrimack Station was the first investor owned utility in the nation to install an SCR to achieve NOx reductions. Given the operation of the SCR, it is PSNH's position that maintaining operational flexibility is a critical priority in order to ensure continued and cost-effective compliance while simultaneously achieving significant reductions in NOx emissions. The following information summarizes the primary drivers behind the increased costs that would be incurred in ensuring attainment of NOx emissions rates lower than the current NOx emission limits set in the NH Regional Haze SIP.

1- Operational Impacts

Based on historical data MK2 typically has 10 to 15 outages per year and approximately 8 low load operations per year. During these events, SCR operating temperatures are reduced and in some instances below the SCR permissive temperature limit. The SCR temperature permissive must be met in order for the SCR to be put in service or kept in service. During start-ups, shut-downs, and partial load operation the temperature could be lower than the permissive temperature and the SCR cannot be operated. In most cases the timing of these events is not predictable.

Examples of low load situations include, but are not limited to, the following:

- Forced and planned outage start ups and shutdowns;
- Loss of one of any equipment pair. Both pieces are necessary for full load operation and the loss of one results in half load operation (such as forced draft fans, condensate pumps);
- Loss of the main boiler feed pump;
- Loss of coal feeders, condenser waterbox cleaning, etc.; and
- Any condition which results in the flue gas temperatures to be below the SCR permissive temperature will result in the SCR not able to be put in service.

A more stringent limit could result in the unnecessary shutdown of the unit rather than operating at partial load. An example of this scenario has occurred in the past when a critical pump failed which restricted full load operation. While the pump was repaired the unit remained operating

EXHIBIT 1

but at a reduced capacity, the duration of this event was approximately 240 hours. PSNH's customers received significant benefit from this partial load operation. Replacement power costs associated with this type of event are shown in the Table 1.

Replacement Power Costs: The table below uses an assumption of $30/mwhr difference between the cost of MK2 and the market cost. This number can vary greatly depending on energy market prices.

Table 1a. Cost Associated with De-rate Flexibility at 0.37 lb/MMBtu Assumes 0.64 tons per hr				
Duration of De-Rate	De-rate Capacity	Remaining Capacity Online	Avoided Replacement Power Cost	Cost per ton
240 hr	132 MW	200 MW	$1,440,000	$0
100 hr	132 MW	200 MW	$ 600,000	$0
50 hr	132 MW	200 MW	$ 300,000	$0

Table 1b. Cost Associated with limited De-rate Flexibility at 0.34 lb/MMBtu Assumes 0.59 ton per hr				
Duration of De-Rate	De-rate Capacity	Remaining Capacity Online	**Un-avoided** Replacement Power Cost	Cost per ton
240 hr	132 MW	200 MW	$1,440,000	$10,169
100 hr	132 MW	200 MW	$ 600,000	$10,169
50 hr	132 MW	200 MW	$ 300,000	$10,169

The opportunity for partial load operation during high demand periods would be even more costly to both reliability and to customers. The example mentioned above resulted in a long duration of partial load operation but it is important to note that during periods of high energy prices a much shorter event could also have significant cost. For example, assuming a $100 per MWh market price, operating at 200MW partial load for a period of 12-hours would avoid $240,000 of replacement power cost. During this period a NOx reduction of approximately 7 tons would be realized which equates to $34,000 per ton NOx. Under some of these scenarios partial load operation would be eliminated to ensure consistent compliance with the proposed NOx limit reduction.

2 – Maintenance Impacts

PSNH's highest priority is ensuring compliance with all emission limits. PSNH has reviewed historical data and concluded that start-ups, shut downs partial load operating conditions and upsets can significantly impact a calendar month average emission rate. To account for these events PSNH operates NOx control equipment to maintain a NOx emission rate of approximately 0.25 lb/MMBtu calendar month average. In order to ensure compliance with the 15.4 ton/day limit or the equivalent 0.37 lb/MMBtu emission rate, PSNH targets a 0.15 lb/MMBtu difference between the average NOx emission rate and the specific limit. Further limitations would impact operation and increase incremental maintenance and capital cost.

In addition to boiler operation and load conditions that affect SCR operation, malfunctions of the SCR system and/or associated equipment can also affect the operation of the SCR. Malfunctions of the SCR system and/or associated equipment can result in partial or complete reduction of SCR performance.

Also, as part of normal service, the SCR performance degrades overtime. One reason this occurs is due to blinding of the catalyst with fly ash. This condition will cause the SCR process control settings to compensate by increasing SCR loading to maintain the set point. This is necessary because the reagent distribution becomes less uniform as less surface area of the catalyst is exposed to the flue gas. To manage this condition from developing to the point that a maintenance outage is necessary, the SCR is cleaned on-line utilizing soot blowers and cleaned during outages, as needed. Increased SCR loading could lead to more frequent maintenance outages. It is anticipated that a minimum of three additional SCR cleanings and air heater washes would be necessary to maintain compliance with the 0.34 lb/MMBtu proposed NOx limit. Cleanings are expected cost between $30,000 and $100,000 as noted below in item 3. Replacement power costs associated with the necessary maintenance outages are also described in item 3 below.

Additionally, reagent injection grid nozzles are directly exposed to the flue gas and become fouled over time. This can affect reagent distribution, compounding the effect of blinded catalyst. The reagent injection grid is cleaned, as needed, during outages. Also as catalyst ages, it becomes less reactive. This causes a reduction in ability for NOx conversion to take place. This in itself does not typically result in higher NOx emissions because the SCR has four layers of catalyst, intentionally staggered in age. However, increased loading of the SCR catalyst would be necessary to maintain compliance with the proposed reduction in NOx limit and accelerate catalyst degradation. For example, the SCR is unable to perform continually at its maximum capability. As a result, PSNH needs flexibility to operate the SCR based on current operating conditions. Currently the SCR averages greater than 86% efficiency.

Each catalyst layer has an anticipated functional life of 8 years and each layer is staggered in age to accommodate replacing one layer every 24 –months. Further NOx limitation would increase loading of the SCR and could result in accelerated catalyst degradation requiring premature replacement. This would result in a loss of investment. Even if minor catalyst degradation occurred reducing the catalyst useful life from 8 years to 7.5 years the replacement schedule would need to be adjusted. The change in replacement schedule is necessary because catalyst replacement projects must coincide with MK2's overhaul schedule which is on a 12-month cycle. PSNH would incur a loss of investment of approximately $143,000 annually due to the early replacement. It is also important to note that the revised replacement plan would result in minimal reductions to the total reduced tons of NOx for the year, but rather be put in place to avoid the periodic increased emission rates at the end of the catalyst life. As shown below in Table 2, PSNH believes minimal catalyst replacement and maintenance cost are associated with the 0.37 lb/MMBtu rates provided certain exceptions for start-up and shutdown and malfunctions.

Table 2. Incremental Maintenance and Capital Cost				
Emission Limit (lb/MMBtu)	Calendar Month Control Target (lb/MMBtu)	Annual Loss of Investment of SCR Catalyst	Increase Maintenance (Cost of Air heater and SCR Maintenance)	Predicted Incremental Cost
0.37	0.22	$0	$0	$0
0.34	0.19	$143,000	$195,000	$338,000

3 –*Replacement Power Costs associated with the Proposed Reduction in NOx Emission Rate*

Merrimack Station will need to consider a number of additional compliance efforts if not provided the necessary flexibility to deal with short-term events as described above and the operational restrictions of the SCR. Each has an additional cost as outlined below.

There will be increased maintenance costs to maintain peak NOx reduction capability. For example, air heater and SCR cleanings will be required more frequently because of increased loading of the SCR. This results in additional maintenance costs and replacement power costs associated with the required outages. It is anticipated that at least one additional 4.5 day (mid) maintenance outage would be necessary to maintain compliance with the 0.34 lb/MMBtu proposed limit. In addition to the maintenance outage additional cleaning will be completed as a proactive measure during forced outages resulting in delayed start-ups. Outage duration is from time offline until the unit is phased.

If air heater washing were completed to comply with a step change in the NOx rate as shown below, the cost per ton of NOx reduction would be extremely costly. Again this number can increase greatly if an air heater cleaning was completed during a high priced market.

Table 3. Potential Emission Summary (8760 hrs)		
Emission Rate Lb NOx/mm BTU	NOx tons emitted per year	Incremental reduction in Potential emissions tons per year
0.37	5628.34	0
0.34	5171.99	456

Maintenance (Cleaning) Costs: $30,000 to $100,000 per cleaning

Replacement Power Costs: The table below uses an assumption of $30/mwhr difference between the cost of MK2 and the market cost. This number can vary greatly depending on energy market prices.

Table 5. Impact of 0.34 lb/MMBtu Limit	
Duration of Cleaning/Outage	Replacement Power Cost per Outage
Short (3 days)	$720,000
Mid (4.5 days)	$1,100,000
Long (6 days)	$1,400,000

It should be reiterated that these compliance measures are focused solely on the shorter duration events that typically occur at lower loads with less heat input and for a discreet period of time thus do not result in the emission of a significant amount of NOx emissions. To meet the proposed rates of 0.34 lb NOx/MMBtu, under the conditions referenced above, PSNH may be forced to shutdown for air heater/SCR cleaning and also may be forced to shutdown rather than operate at partial load. Each of these aforementioned scenarios has significant cost as described above.

Also, with out exceptions for short term operational conditions additional incremental costs may be incurred when considering a calendar month averaging period. PSNH may be forced to delay start-up to maintain a 0.34 lb/MMBtu calendar month average. It is important to note that start-up shutdowns, and partial load operating scenarios may bias a lb/MMBtu rate but typical result in low tonnage emission total. To manage for this situation it may be necessary for PSNH to adjust the current operating strategy by delaying start-ups or to prevent a short operating periods during the calendar month. Table 6., below illustrates the potential cost with delaying an outage start-up.

Table 6. Replacement power cost associated with delayed start-up			
	Cost delta with the Market	Total cost of Outage for customers	Cost per Ton *
1 day	$30	$239,040	$15,936
	$40	$318,720	$21,248
	$50	$398,400	$26,560
2 days	$30	$478,080	$31,872
	$40	$637,440	$42,496
	$50	$796,800	$53,120

*assumes saving of 15 tons per day

4 - Summary of Analysis

Merrimack Station has had a program in place to reduce NOx emissions for the past 15 years. The reductions in total annual emissions reflect that laudable effort. Going forward, Merrimack Station anticipates continuing that effort, while maximizing customer value and providing reliable and affordable power. It is critical to understand adjusting the NOx rate will significantly increase the incremental costs of compliance without significantly decreasing total NOx emissions. This effort will have virtually no effect on MK2's actual emissions and is focused on limiting MK2's potential emission which results in eliminating operational flexibility and increasing operating costs. Table 7. below is a summary of the incremental costs that PSNH will incur when considering the 0.34 lb/MMBtu proposed NOx emission rate.

Table 7. Summary of Additional Predicted Annual Cost

Emission Limit (lb/MMBtu)	Calendar Month Control Target (lb/MMBtu)	Loss of Investment of SCR Catalyst per year	**Un-avoidable** Replacement Power cost (Partial Load) @ 240 hrs	Increase Maintenance (Cost of Air heater and SCR Maintenance) 3 per year	Replacement Power Cost For Maintenance Outage at $30 MWH	Delayed start-up to clean SCR and Air Heater 2days (One day each for two outages)	Incremental reduction in <u>Potential</u> tons per year	Predicted Incremental Cost Increase $/yr	Cost per ton
0.37	0.22	$0	$0	$0	$0	$0	0	$0	$0
0.34	0.19	$143,000	$1,440,000	$195,000	$1,100,000	$478,080	456	$3,356,080	$7,359

This analysis demonstrates that the implementation of a 0.34 lb/MMBtu or more stringent rate will result in significant cost to our customers with little environmental benefit. This is true because a lb/MMBtu rate could result in running the SCR harder, more frequent air heater cleaning, extended outages, and forced outages, and limit partial load operation.

PSNH would be happy to meet with you and your staff to discuss the information provided above. If you have questions or require additional information, please contact Lynn Tillotson at 634-2440 or Sheila Burke at 634-2512.

cc:
Elizabeth H. Tillotson, TBM, Generation Staff
Sheila Burke, Generation Staff
Tara Olson, Newington Station

New Hampshire Regional Haze SIP Revision
Responses to Sierra Club's Comments

On November 22, 2010, the New Hampshire Department of Environmental Services (NHDES) received comments in a letter from Attorney Arthur B. Cunningham, representing the New Hampshire Sierra Club, on New Hampshire's proposed rule Chapter Env-A 2300 *Mitigation of Regional Haze*. These comments were resubmitted on December 20, 2010. Below, NHDES responds to specific comments contained in that letter. **Comments are written in *italics* and responses are written in regular font.**

Comment: *You have determined that the July 17, 1998, NOx RACT Order for Merrimack Station MK2 satisfies the Regional Haze BART requirement. The 1998 NOx RACT Order requires that MK2 emit no more than 15.4 tons of NOx per each 24 hour calendar day. In the BART analysis, 15.4 tons per day equates to 0.37 lbs/MMBtu of NOx. NHSC rejects your determination that the MK2 RACT Order satisfies BART. [Footnote 1: .37 lbs/MMBtu is almost four times the presumptive .1 lbs/MMBtu BART emission limit set forth in 40 CFR 51, Appendix Y.]*

- **NHDES Response:** The presumptive NOx limit is not representative of the performance capabilities of Unit MK2, for reasons explained in the BART analyses of the Regional Haze SIP, Attachment X. However, after receipt of new data from PSNH (see Attachment X), NHDES has determined that the appropriate BART emission limit for this unit is 0.30 lb/MMBtu, which is incorporated into the now-adopted rule as a maximum allowable emission rate to be measured on a 30-day rolling average basis.

Comment: *New Hampshire Department of Environmental Services-Air Resources Division (ARD) review of the Regional Haze BART requirement for Merrimack Station* <u>*intersects*</u> *with the legal necessity of ARD review of the New Hampshire nonattainment program, particularly for NOx, a major component of both regional haze and ozone. ARD is required by the Clean Air Act to timely establish a NOx emission limit for Merrimack Station MK2 that satisfies both the Regional Haze BART requirement and the nonattainment program. New Hampshire is delinquent in the establishment of both programs...*

The MK2 NOx emissions problem must be addressed in both the Regional Haze program and the nonattainment program. It makes <u>*no sense whatever*</u> *to fix a 0.37 lbs/MMBtu BART emission limit for NOx knowing that a more stringent attainment NOx limit is due.*

- **NHDES Response:** NHDES acknowledges the need for review of the NOx RACT emission limit for Unit MK2. However, this review should be undertaken in the context of pending revisions to the National Ambient Air Quality Standards for ozone. It would be premature to issue a strengthened NOx RACT order for Unit MK2 before EPA has promulgated the revised standards and NHDES has considered the scope of emission reductions needed to meet those standards. On the other hand, there is an immediate need to establish a BART emission limit for Unit MK2. While the regional haze program must proceed without further delay, there exists no obligation to review nonattainment requirements for NOx in conjunction with the regional haze program or BART.

Comment: *PSNH has increased the historic net generating capacity of MK2 from 320 MW to an ISO NE capacity claim of 338 MW. PSNH is currently operating MK2 at 332 MW...NHSC rejects the PSNH claim that the generation upgrade is entirely due to increased efficiency of the replaced MK2 turbine 2. ARD has failed to examine this generation upgrade and its impact on emissions.*

- **NHDES Response:** Concerning work completed by PSNH during the 2008 Merrimack Station Unit MK2 outage (the MK2 Turbine Project), NHDES reviewed the proposed modification in accordance with its permitting requirements, including New Hampshire's New Source Review program. NHDES's decision on this permitting action was documented in a letter to Public Service of New Hampshire dated March 31, 2008, and references the provisions of 40 CFR 52.21(b)(21)(iv), commonly referred to as the "WEPCO Rule" Specific permitting actions are handled through the Department's permitting programs and are not relevant to the BART analysis.

Comment: *The MK2 SCR cannot be operated fulltime because of a temperature permissive. During start-ups, shutdowns and low load operations (below 230 MW net) the SCR cannot operate...PSNH asserts that the uncontrolled NOx rate is typically 1.0-1.5 lbs/MMBtu. PSNH, because of these concerns, insists that it needs "flexibility" to operate the SCR at a much higher emission limitation. [Footnote 3: Data contained in ARD files indicate that MK2 NOx removal is, on average, below the .37 lbs/MMBtu NOx RACT limit.]*

Existing ARD data does not support the PSNH claim that MK2 emits only 1.0-1.5 lbs/MMBtu during low load operations with the SCR shut down. ARD must examine the integrity of the PSNH low load emission claim because it is a critical part of the BART emission calculation as it exists in the proposed Regional Haze SIP...ARD must fix a NOx emission limit that fully accounts for the periods when the SCR is not in operation.

- **NHDES Response:** In new data provided by PSNH (see Regional Haze SIP, Attachment X supporting documentation), the company applies an emission rate of 0.8 lb/MMBtu during low-load operations for the calculation of NOx emissions, 30-day rolling average. This value, which NHDES considers reasonable and conservative, was a factor in determining the BART emission limit of 0.30 lb/MMBtu.

Comment: *PSNH, in its confidential submissions to ARD ordered released by ARD, asserts that it will be too expensive ($10,169 per ton at 0.34 lbs/MMBtu) if it cannot maintain the de-rate flexibility at 0.37 lbs/MMBtu...If the PSNH cost claims are correct, PSNH will not be able to meet its Clean Air Act obligations under the secondary standard attainment program.*

- **NHDES Response:** The determination of cost-effectiveness is not an absolute process but one that must be conducted in proper context. The context for regional haze is different from that for attainment/nonattainment. In the case of the former, any judgment of cost-effectiveness (the process *does* have subjective elements) involves consideration of total cost versus visibility improvement. For the BART analysis of Unit MK2, it was necessary to consider what constitutes a reasonable cost per ton to produce a small visibility benefit. When it comes to NOx reductions toward attainment of a new ozone standard, the benchmarks will be different because the standards for ozone are health-based.

ATTACHMENT K

MANE-VU Natural Background Visibility Conditions

APPENDIX XX.

NATURAL BACKGROUND VISIBILITY CONDITIONS

CONSIDERATIONS AND PROPOSED APPROACH TO THE CALCULATION OF NATURAL BACKGROUND VISIBILITY CONDITIONS AT MANE-VU CLASS I AREAS

NATURAL BACKGROUND VISIBILITY CONDITIONS

1. INTRODUCTION

The long-term visibility conditions that would exist in absence of human-caused impairment are referred to as *natural background* visibility conditions. Accurate assessment of these conditions is important due to their role in determining the uniform rate of progress that must be considered when setting reasonable progress goals for each mandatory Federal Class I area subject to the Regional Haze Rule. Baseline visibility conditions – based on monitored visibility during the five year baseline period (2000-2004) – and estimated natural background visibility conditions will determine the uniform rate of progress to be considered when setting reasonable progress goals for any Class I site.

The U.S. Environmental Protection Agency (EPA) issued draft methodological guidelines for the calculation of natural background and baseline visibility conditions at each site as well as methods for tracking progress relative to the uniform rate of progress that these values determine. This draft guidance, issued in September 2001 was subsequently finalized in September 2003. The final guidance recommends a default method and allows for certain refinements that states may wish to pursue in order to make these estimates more representative of a specific Class I area that may be poorly represented by the default method.

This appendix provides a description of the default method for calculation of natural background conditions. In addition, the default method is applied to each Class I area in or near the MANE-VU region in order to establish *default* natural background conditions on the twenty percent best and worst days. A discussion of potential refinements to the default method is presented along with rationale for their consideration. The uncertainty associated with each potential refinement is then considered in the context of the overall uncertainty of the default estimates. Finally, a recommendation for estimating natural visibility conditions to be included in this SIP is provided.

Based upon these analyses, as well as comments received on the draft MANE-VU proposal, it appears that while some aspects of the default calculation method are understood well enough that they could be considered as potential refinements, MANE-VU does not feel these refinements are warranted in light of the very large uncertainties associated with the most basic elements of the default estimates (naturally occurring ambient concentrations). The identified refinements would result in substantial differences relative to default estimates without significantly improving the accuracy of our estimate relative to the default. Rather, MANE-VU advocates a proposed approach that is based on use of the default estimates while a program of research is undertaken to refine those elements which are most uncertain (natural concentrations) in order to reduce the overall uncertainty as better scientific understanding of these issues evolves. Refinements to other aspects of the default method (e.g. refinements to the assumed distribution or treatment of Rayleigh extinction, inclusion of sea salt, and improved assumptions about the chemical composition of the organic fraction) may be warranted prior to submissions of SIPs depending on the degree to which scientific consensus is formed around a specific approach and will be reconsidered at a later point.

2. THE DEFAULT METHOD

The default method is explained in detail in *Estimating Natural Background Visibility Conditions* (U.S.EPA, 2003). Summary information is provided here but the reader should consult the original guidance documents for any question as to how this method is applied.

Estimates of natural visibility impairment due to fine and coarse particles were derived using the 1990 National Acid Precipitation Assessment Program reported average ambient concentrations of naturally present particles (Trijonis, 1990). Separate concentration values were given for the Eastern and Western United States, no finer spatial resolution is available. Average natural background light extinction due to particles was then calculated using the IMPROVE methodology and site specific ANNUAL f(RH) values. Worst visibility levels are derived using the work of Ames and Malm (2001), who estimated the standard deviation of visibility in deciviews in the eastern US as 3 dv. By assuming a roughly normal distribution of data, the default method adds (subtracts) 1.28*(3 dv) to the average estimated natural background to calculate the 90^{th} (10^{th}) percentile level which is taken by EPA to be representative of the mean of the twenty percent worst (best) conditions.

Thus in the East, the default method for calculating best and worst natural background visibility conditions (in deciviews) for any area in the Eastern U.S. would use the following formulae:

$$P90 = HI + 1.28\ sd$$

$$P10 = HI - 1.28\ sd$$

Where The Haze Index (HI) represents annual average visibility in units of deciview and sd is the standard deviation of daily average visibility values throughout a year, defined by the guidance as 3.0 for the Eastern U.S. The Haze Index is calculated as shown:

$$HI = 10 \ln (bext/10)$$

where the atmospheric extinction, bext, is given by the familiar IMPROVE equation (IMPROVE, 2000) in inverse megameters:

Table 1. Default Parameters Used in Calculating Natural Background Visibility for Sites in the Eastern U.S.

Parameter	Value	Fractional Uncertainty	Reference/Comments
[SULFATE]	0.23 μg/m³	200%	Trijonis, 1990
[NITRATE]	0.10 μg/m³	200%	Trijonis, 1990
[OC]	1.0 μg/m³	200%	Trijonis, 1990
[LAC]	0.02 μg/m³	250%	Trijonis, 1990
[SOIL]	0.50 μg/m³	200%	Trijonis, 1990
[CM]	3.0 μg/m³	200%	Trijonis, 1990
f(RH)	~3.2	15%	Varies by site (see Table 2)
Organic multiplier	1.4	50%	[OCM]=1.4*[OC]
$\sigma_{S/N}$	3.0 m²/g	33%	Hegg, 1997; IMPROVE, 2000; Malm, 2000
σ_{OC}	4.0 m²/g	30%	Hegg 1997; Trijonis 1990
σ_{EC}	10.0 m²/g	40%	Malm, 1996
σ_{soil}	1.0 m²/g	25%	Trijonis, 1990
σ_{coarse}	0.6 m²/g	33%	IMPROVE, 2000
Rayleigh	10 Mm⁻¹	20 %	Varies with altitude/season
sd (standard deviation of daily visibility)	3.0 dv	16%	Ames and Malm, 2001
10th, 90th percentile adjustment	1.28	15%	Regulation calls for mean of top twenty percent, not 90th percentile
Parameters used in potential refinements			
[NaCl]	~0.5	50%	Varies by site, IMPROVE
σ_{NaCl}	2.5 m²/s	16%	Haywood, 1999
$f(RH)_{NaCl}$	~3.2	33%	Assumed same as S, N

Note: the mass estimates presented above are based are on estimates of fine particulate concentrations that would exist in absence of any manmade pollution (including Mexican and Canadian emissions) consistent with planning requirements of the regional haze rule. MANE-VU accepts this as an appropriate planning goal and intends to consider the contribution of international transport in deciding what controls are "reasonable" under the regional haze program.

$$\text{bext} = (3)f(RH)[\text{sulfate}] + (3)f(RH)[\text{nitrate}] + (4)[\text{OMC}] + (10)[\text{LAC}] + (1)[\text{SOIL}] + (0.6)[\text{CM}] + 10$$

Thus with respect to potential refinements to the default method, three primary approaches can be considered: refinements to the mass estimates (including spatial and temporal allocation as well as addition of other important species), refinement to the relative humidity adjustment factors (including averaging times and addition of adjustment factors for species assumed to be non-hydroscopic), and refinement to the assumed distribution of visibility conditions throughout the year (including the width, amplitude and potentially shape of the distribution). Potential refinements are considered in section 4.

Table 1 below provides the default values to be applied at all Eastern U.S. Class I areas. The result of using these default values in the above equation with an assumed annual average f(RH) value of 3.17 (the average of 11 Northeastern U.S. sites) default estimated visibility in the Northeastern U.S. is approximately 3.6 dv on the twenty percent best days and 11.3 dv on the twenty percent worst days.

3. APPLICATION OF THE DEFAULT METHOD

The Class I areas in the MANE-VU region that are subject to the requirements of the regional haze rule are: Acadia National Park, Maine; Brigantine Wilderness (within the Edwin B. Forsythe National Wildlife Refuge), New Jersey; Great Gulf Wilderness, New Hampshire; Lye Brook Wilderness, Vermont; Moosehorn Wilderness (within the Moosehorn National Wildlife Refuge), Maine; Presidential Range – Dry River Wilderness, New Hampshire; and Roosevelt Campobello International Park, New Brunswick. In addition to these Class I areas, we consider several nearby Class I areas where MANE-VU states may be contributing to visibility impairment. These Class I areas include: Dolly Sods Wilderness and the Otter Creek Wilderness in West Virginia as well as Shenandoah National Park and the James River Face Wilderness in Virginia. MANE-VU understands that it is the responsibility of the appropriate VISTAS states to establish estimates of natural visibility conditions and reasonable progress goals for these areas. It is anticipated, however that subsequent consultations will occur with those MANE-VU states which may be affecting visibility in these areas. MANE-VU has therefore calculated estimates of natural background visibility conditions at the nearby sites using MANE-VU approved methods in order to facilitate future consultations.

The only factor in the default method that varies by site is the climatological annual mean relative humidity adjustment factor. Table 2 lists this value for the Class I sites of interest and the resulting best 20 percent and worst 20 percent estimates of natural visibility conditions. The variation among sites using the default method is purely a function of differences in climatological annual mean relative humidity, with southern and coastal sites being more humid than inland or elevated sites.

Table 2. Site Specific Relative Humidity Adjustment Factors, Best and Worst (Default) Estimates of Natural Background Visibility Conditions

MANE-VU Mandatory Federal Class I Area	F(RH)	Best Visibility (dv)	Worst Visibility (dv)
Maine			
Acadia National Park	3.34	3.77	11.45
Moosehorn Wilderness	3.15	3.68	11.36
Roosevelt Campobello International Park, New Brunswick	3.16	3.68	11.37
New Hampshire			
Great Gulf Wilderness	3.01	3.63	11.30
Presidential Range – Dry River Wilderness	3.02	3.65	11.30
New Jersey			
Brigantine Wilderness	2.97	3.60	11.28
Vermont			
Lye Brook Wilderness	2.91	3.57	11.25
Nearby Mandatory Federal Class I Area			
Virginia			
James River Face Wilderness	2.93	3.56	11.26
Shenandoah National Park	2.95	3.57	11.27
West Virginia			
Dolly Sods Wilderness	3.06	3.64	11.32
Otter Creek Wilderness	3.06	3.65	11.32

4. POTENTIAL REFINEMENTS

According to the guidance (U.S. EPA, 2003), "… the default approach to estimating natural visibility conditions presented in this document is adequate for the development of progress goals for the first implementation period under the regional haze rule." However, the guidance does leave the door open for individual states or RPOs to adopt their own methods for calculating natural background if they can demonstrate that the change from the default represents a significant refinement that better characterizes natural visibility conditions at a specific Class I site.

The five Regional Planning Organizations have identified a number of areas for potential improvement and have hired a contractor to refine the understanding of natural background levels of particulates. The statement of work for this project (managed by the WRAP) includes the following text: "There are three broadly different ways to refine the default natural aerosol concentrations that are briefly discussed in the guidance document. The default annual estimates of species concentrations for the best and worst 20% haze conditions can be replaced by better annual estimates, by seasonally varying estimates, or by event-specific estimates (e.g. in the case of forest fire and dust storm impacts). Any technically defensible combination of these different ways to refine the natural aerosol concentration is acceptable. It is likely that refinement will be a multi-step process over a period of many years as the information required to justify changes are developed and reviewed." The three methods of refinement noted in this statement of work, mirror those listed in the guidance, however, the guidance also states that, "states may identify other[refined approaches] that are more appropriate to their own situations."

As noted in section 2, in addition to different ways to adjust ambient concentration estimates, the relative humidity adjustment factor and the shape of the distribution would also affect the resulting estimates of naturally occurring visibility. The VISTAS RPO has commissioned a consultant to investigate potential refinements to natural background (Tombach, 2003). In addition, a white paper developed by EPRI on this topic and a recent presentation by Bill Malm of CIRA (a principal investigator of the IMPROVE program) all serve to inform the multitude of ways that calculations for natural background conditions could be refined (Malm, 2004; Kumar, 2004). A synopsis of several potential refinements and the rationale for their consideration are presented here. For more detailed discussion of the scientific merit of each potential refinement, the original references cited above (or those contained in the brief explanations below) should be consulted.

1. Increase the value of the organic multiplier

The estimates of organic carbon mass that are used in the guidance are derived from Trijonis (1990), however his original estimate (1.5) has been adjusted to be consistent with the ratio of organic carbon mass/organic carbon that is used in the IMPROVE program. This value, 1.4, is uncertain and several review articles and studies (Watson 2002, Turpin and Lim 2001, Malm 2004) have suggested higher values between 1.8 and 2.1 are more appropriate values. If a higher value were to be used for the organic carbon multiplier, the estimate of natural background organic carbon mass would be similarly affected since the original Trijonis estimate was based on organic carbon, [OC], and a multiplicative factor which relates [OC] to organic carbon mass, [OCM].

2. Adjust the factor used to translate average visibility conditions into twenty percent worst or best conditions

The guidance recommendation for calculating the twenty percent worst and best visibility conditions by multiplying the average by 1.28 times the standard deviation of 3.0 assumes a normal distribution and is designed to return the 90th percentile value in that distribution. The Regional Haze Rule requires improvement on the average of the twenty percent worst days. This value is not equivalent to the 90th percentile of a normal distribution. The 92nd percentile is closer to the simple average of the top twenty percent of values, if you assume a normal distribution (Lowenthal et al., 2003). In this case, a factor of 1.40 is more appropriate for calculation of the 92nd percentile, or the mean of the top twenty percent of values. However, it is clear that the distributions of visibility conditions at most Class I sites are not perfectly normal. In fact, the 90th percentile may be closer to the average of the top twenty percent of visibility conditions at sites that do not experience as many extreme visibility conditions as a normal distribution would predict (Malm, 2004).

3. Account for visibility impairment due to sea salt at coastal sites

Many Class I sites are located along the coast and are significantly affected by coarse mode sea salt particles. The tail of the coarse mode sea salt particle size distribution is within the sub-2.5 micron size fraction and should properly be included the IMPROVE equation. This would be a straightforward refinement if we assume that all sea salt is in the form of sodium chloride (NaCl). However, significant evidence suggests that a substantial portion of the sodium along the Gulf Coast is associated with sodium nitrate ($NaNO_3$) (Malm, 2004). As sea salt particles age, atmospheric chemical processes appear to replace chloride with other ions, altering both the chemical composition and the scattering efficiency.

4. Account for hygroscopicity of sea salt

Research to date reflects a substantial degree of uncertainty regarding the appropriate scattering efficiency and hygroscopic growth of sea salt particles. Refined estimates hold the potential to significantly change natural background estimates depending on assumed composition and concentrations.

5. Account for organic PM of oceanic origin

Observational evidence exists to support the hypothesis that significant levels of organic precursor gases are emitted over the open ocean which could potentially increase the natural background levels of organics, particularly at coastal sites.

6. Review soil concentrations

Tombach (2003) suggests that fine soil contributions in the Southeast U.S. are underpredicted by the Trijonis estimate of 0.5 ug/m3. He bases this on the estimated impact of Saharan dust and Asian dust that are subject to inter-continental transport. The contribution of these sources to Northeast and Mid-Atlantic sites is estimated to be significantly less than for Southeast and Western U.S.

7. Account for episodic inter-continental dust contributions

In addition to contributing on an annual average basis, the Saharan and Asian dust impacts are likely to be highly variable in time and should not necessarily be applied on an annual average basis. Given the extreme uncertainty in predicting the frequency of occurrence at any specific site, there is no reliable means of estimating the temporal frequency for these effects.

8. Review organic and sulfur emissions from forests

Observational evidence exists for the tropics (mostly the Amazon River Basin) to suggest that the estimated natural background concentrations of organics and sulfur compounds may be significantly higher than the Trijonis values in those areas. Application of these data to U.S. areas remains highly uncertain and requires further research.

9. Improve estimates of organic and elemental carbon released by natural fires

Global modeling studies have produced estimates for organic and elemental carbon released by natural fires that are consistent with the Trijonis estimates used by EPA. Nonetheless, these studies as well as the Trijonis estimates remain uncertain and could be refined through further research efforts.

10. Account for inter-continental sulfate and nitrate contributions

Techniques to account for the fraction of light scattering and absorbing PM that results from extra-jurisdictional anthropogenic emissions (i.e. Canada, Mexico, Asia) could be developed with the same rough level of uncertainty that is used in the current default method for calculating natural visibility conditions. This is less a refinement of natural background, however and more of a policy decision as to how natural background conditions are defined and what is an appropriate planning goal. The definition in statute and planning goal supported by the courts should remain as described in EPA guidance. MANE-VU feels that international contributions to Class I fine particulate burdens should be considered in setting reasonable progress goals, not natural condition estimates.

11. Use global chemical transport models to refine estimates of natural ambient concentrations

The use of global models will certainly prove to be a useful tool for future research into the topic of natural background conditions, but MANE-VU does not feel that these tools provide a consistent framework to serve as the basis for a national program. The uncertainties within the model structure mirror the uncertainties in observational evidence for deducing ambient emission levels of specific PM components.

12. Refine temporal resolution of relative humidity adjustment factors/consider observed relative humidity data instead of climatological average data.

The use of different averaging periods and different relative humidity data certainly does affect the resulting estimates of visibility conditions. Climatologically average data serves to remove inter-annual variability of humidity from the process of tracking progress. This ensures that measured progress is based on changes in pollution, rather than meteorological variability. Further research into the most appropriate averaging period is still warranted.

In addition to the many potential refinements listed above, NESCAUM has considered one other possible refinement to the default method; the use of a higher Rayleigh scattering estimates for coastal sites ($12 Mm^{-1}$ are approximate Rayleigh conditions at sea level; $10\ Mm^{-1}$ is used for *all* sites in the IMPROVE equation).

Of the multitude of ways that natural background visibility conditions could be refined, MANE-VU believes that very few can be justified as significantly improving the accuracy on the basis of current scientific understanding. That is not to say that MANE-VU feels that the default estimates of natural conditions are truly representative of natural conditions at each site or that each of the potential refinements listed above does not bear further investigation, but rather that alternative methods or values for use in calculating more precise values for most of the refinements listed above are not readily available at this time.

Research into many of the potential refinements above should be continued and MANE-VU intends to continue research on many of these questions. However, MANE-VU feels that only a very few of these potential refinements can justifiably be considered at this time. These include an alternative value for the carbon multiplier, the calculation of the 92nd percentile of a normal distribution to represent the mean of the top twenty percent worst visibility conditions, and the inclusion of sea salt at coastal locations and refined estimates of Rayleigh scattering. Calculations were performed to evaluate the effect of these potential refinements to better understand the effect of such changes on resulting rates of progress and are shown in Tables 3 and 4.

Table 3. Default and Refined Estimates of the Twenty Percent Worst Natural Background Visibility Conditions at MANE-VU and Nearby Sites. Default values are provided for comparison, estimates labeled "[OMC]=[OC]*1.8" are calculated using 1.8 as the organic multiplier, "P90=HI+1.40*sd" values are calculated using the 92nd percentile instead of the 90th percentile of the visibility distribution, "w/seasalt" values show the effect of adding the measured value of sea salt mass at coastal sites, and "Rayleigh 12Mm-1" values show the effect of using alternate Rayleigh scattering at coastal sites.

Assumption tested at MANE-VU Mandatory Federal Class I Area	Default Visibility dv	[OMC]= [OC]*1.8 dv	P90=HI +1.40*sd dv	w/ sea salt dv	Rayleigh 12 Mm^{-1} dv
Maine					
Acadia National Park	11.45	12.17	11.81	12.87	12.34
Moosehorn Wilderness	11.36	12.09	11.72	12.88	12.26
Roosevelt Campobello International Park, New Brunswick	11.37	12.09	11.73	12.88	12.27
New Hampshire					
Great Gulf Wilderness	11.30	12.03	11.66		
Presidential Range – Dry River Wilderness	11.30	12.03	11.66		
New Jersey					
Brigantine Wilderness	11.28	12.01	11.64	13.40	12.19
Vermont					
Lye Brook Wilderness	11.25	11.99	11.61		
Nearby Mandatory Federal Class I Areas					
Virginia					
James River Face Wilderness	11.26	11.99	11.62		
Shenandoah National Park	11.27	12.00	11.63		
West Virginia					
Dolly Sods Wilderness	11.32	12.05	11.68		
Otter Creek Wilderness	11.32	12.05	11.68		

Table 4. Estimated baseline visibility conditions,† Uniform Rates of Progress (ROP) to be considered for first implementation period, and Effect of Natural Background Refinements on ROP at MANE-VU and Nearby Sites. "1.8*OC" values are the percent change in uniform progress (relative to the default ROP) resulting from the substitution of the 1.8 carbon multiplier, "1.4*sd" values are the percent change in uniform progress when the 92nd percentiles are used to represent the average of the worst twenty percent visibility conditions, "sea salt" values are the percent change in uniform progress when extinction due to measured sea salt at coastal sites is included and "Rayleigh" values are the percent change in uniform progress when $12 Mm^{-1}$ of Rayleigh extinction is used at sea-level sites.

MANE-VU Mandatory Federal Class I Area	Baseline Visibility dv	Default ROP dv/14 yrs	1.8*[OC] %change	1.40*sd %change	sea salt %change	Rayleigh %change
Maine						
Acadia National Park	22.86	2.66	-3.9%	-3.2%	-6.7%	-6.0%
Moosehorn Wilderness	21.53	2.37	-3.8%	-3.5%	-8.9%	-6.5%
Roosevelt Campobello International Park, New Brunswick	21.53	2.37	-3.8%	-3.5%	-8.9%	-6.5%
New Hampshire						
Great Gulf Wilderness†						
Presidential Range – Dry River Wilderness†						
New Jersey						
Brigantine Wilderness‡	27.92	3.88	-2.5%	-2.2%	-10.5%	-4.7%
Vermont						
Lye Brook Wilderness	24.24	3.03	-4.1%	-2.8%		
Nearby Mandatory Federal Class I Area						
Virginia						
James River Face Wilderness[n]	28.41	4.00	-2.4%	-2.1%		
Shenandoah National Park‡	27.55	3.80	-2.8%	-2.2%		
West Virginia						
Dolly Sods Wilderness	27.72	3.83	-3.1%	-2.2%		
Otter Creek Wilderness	27.72	3.83	-3.1%	-2.2%		

† Note that EPA guidance requires at least 3 complete years out of 5 to calculate baseline conditions. Routine year-round monitoring did not begin at Camp Dodge (IMPROVE site for Great Gulf/Presidential Range) until June 2000 so estimates of baseline conditions (and thus a uniform rate of progress) will not be possible for these sites until data are available through June 2003.

‡ Only 4 years of data was used in the calculation of estimated baseline conditions and uniform rates of progress at these sites since 1998 did not meet completeness criteria at these sites.

The uniform rate of progress as determined by baseline and natural background conditions is most sensitive to absolute changes in natural background estimates (as opposed to baseline conditions), given the logarithmic structure of the haze index. For example, using data from Brigantine Wilderness Area 1999-2002 (a four year period that overlaps, but does not correspond to the baseline period as described by EPA guidance) the default estimate for baseline visibility conditions is 27.92 dv. If sea salt is included in the reconstructed extinction calculation, the baseline estimate increases by 0.24 dv to 28.16 dv. Changes in natural background resulting from the addition to sea salt at Brigantine are from 11.28 to 13.40 dv, a difference of 2.12 dv. The end result is a decrease of approximately 10.5 percent in the required rate of progress slope during the initial period. Although the annual rate decreases by less than 0.03 dv/year, the change over the course of 14 years is 4 tenths of a deciview which is a substantial difference. The estimated impact of adding sea salt to Brigantine has the largest effect of any of the refinements considered here, thus all refinements considered (on an individual basis) have less than 10.5 percent impact on the 1st period progress goal.

While the changes in the rate of progress resulting from these refinements are substantial, the decision to refine baseline conditions must be based on whether the refinements are *statistically* significant. In order to meet that test, a potential refinement must alter the rate of progress to the point that the refined value lies outside the range of uncertainty of the default value. To implement refinements that do not meet this test would result in new values that are substantially different, but not significantly more accurate.

Very large uncertainties are associated with most of the parameters that go into the default natural background calculation and many of the potential refinements. For example, In the case of a change to the organic multiplier, different values ranging from 1.4 to 2.1 or higher have been proposed, however the uncertainty bounds of these estimates are large and overlapping (i.e. most estimates are within the uncertainty bounds of the others and thus are not *statistically* different).

In the case of sea salt, it certainly represents an improvement in accuracy to include a term for sea salt scattering when we know it to exist. Given the potential for complex chemical interaction of sodium and chlorine with other components of particulate matter, estimates of uncertainty are difficult to quantify and large (on the order of 50 percent). While estimated values that would be appropriate for MANE-VU coastal Class I sites are statistically different from zero, the resulting improvement in the overall accuracy of the final natural visibility estimates relative to the default estimates must be calculated using standard error propagation techniques.

Following standard error propagation techniques (Taylor, 1982), estimates of the contribution of each parameter (see table 1) to the overall accuracy of natural extinction estimates have been derived. The fractional contribution of each parameter to total extinction is presented in Figure 1 for coastal and inland sites in the MANE-VU region. As this figure demonstrates, the overwhelming, dominant contributor to the accuracy of the estimate of total extinction is the uncertainty in organic carbon mass.

Because of the logarithmic relationship between extinction and deciview, the standard error propagation techniques do not apply simply to the resulting estimate of natural background deciview. The high and low error bounds for the extinction estimate do not translate into an equivalent fractional uncertainty of the resulting deciview estimate. To account for this, Figure 2 presents a range of contributions to the final natural background visibility in units of deciview. The two estimates of fractional contribution are based on estimates of extinction that correspond to the high and low error estimates of the extinction calculation. Following standard error propagation techniques again, (Taylor, 1982) these two distinct estimates of uncertainty associated with the extinction calculation are then compared to the uncertainty in assumptions regarding the shape of the distribution of natural visibility conditions in units of deciview. Figure 2 presents the relative contribution of each component for both the high and low estimates of extinction. A reasonable estimate for the contribution of each component would, therefore, lie somewhere between these two estimates, but we have no reliable way to determine exactly where. Due to the nature of the logarithmic relationship, the lower estimate is more sensitive to small changes than the upper range of uncertainty, so the true contribution is probably closer to the "high" estimate than the "low" estimate, but cannot be quantitatively determined in an easy way.

Figure 1. Relative contribution to overall uncertainty of natural background visibility extinction at MANE-VU Class I Areas. Several potential refinements that have been proposed are highlighted in red in the legend.

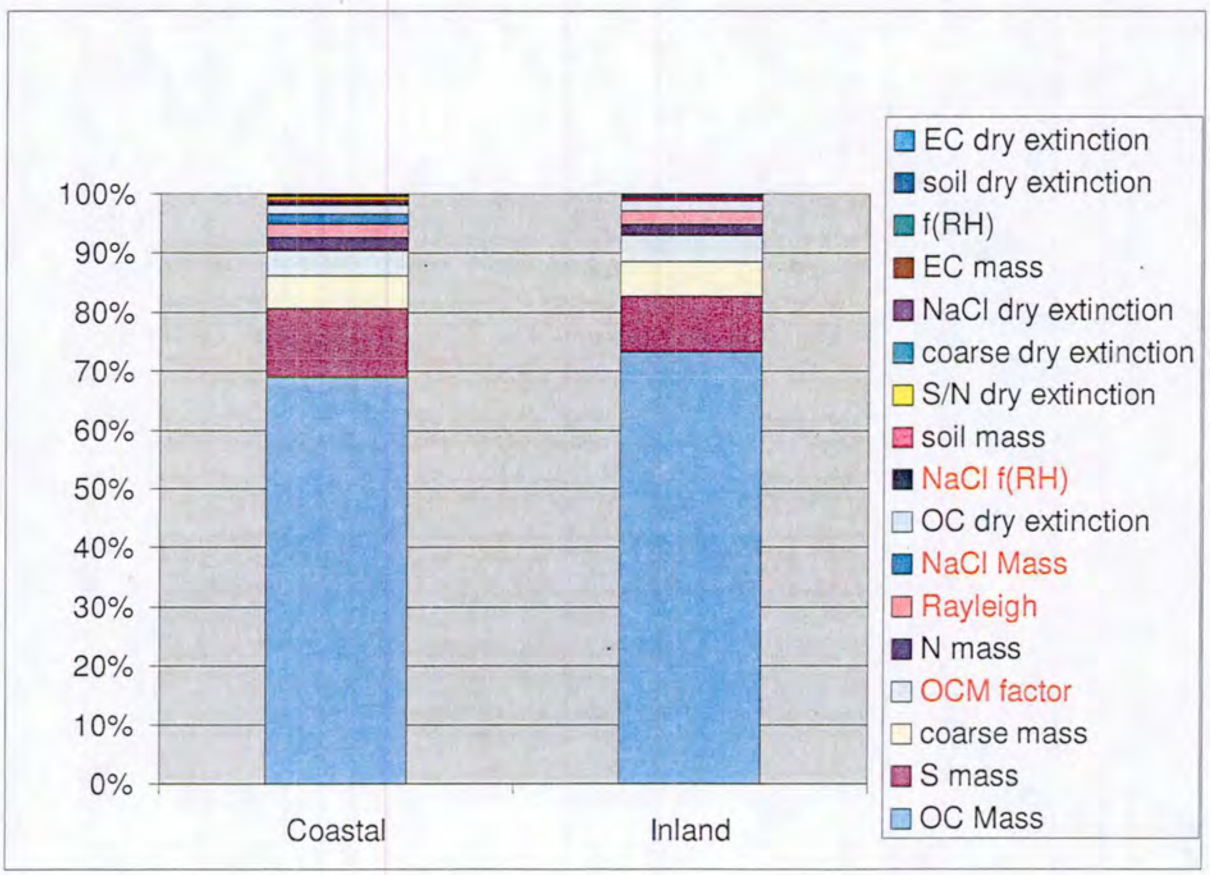
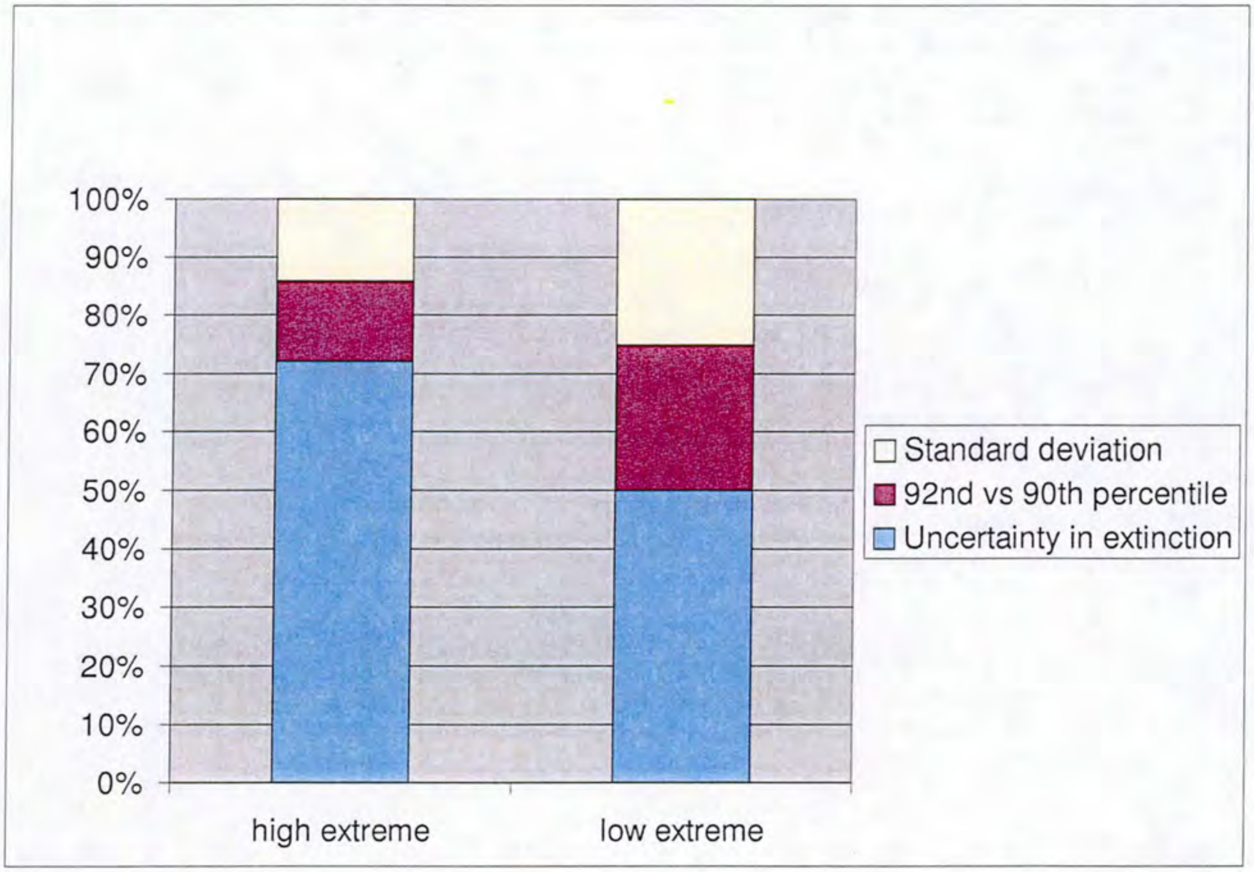


Figure 2. Range of relative contribution to overall uncertainty in natural background deciview estimates (high and low extremes derived using extreme values of extinction range)



Based on this general review of uncertainties associated with the refinements and the potentially substantial effect on rate of progress slopes that could result from implementing such changes, it is appropriate to accept the default natural background visibility estimates as provided in U.S. EPA guidance. The default estimates provide a sound, nationally consistent framework on which to base the regulatory structure of the haze rule that is justified based upon the current state of scientific understanding of these issues.

Further, EPA recommendations on potential refinements (Pitchford, personal communication, 2004) suggest that such refinements be broadly accepted by the scientific community, substantial, practical to implement and not create arbitrary inconsistencies. In addition, these recommendations request that state efforts to refine the default estimates should not side-track technical efforts on other aspects of the regional haze program. Hence, it is appropriate to adopt the default natural background conditions at present time until broad consensus on refined estimates of the individual species concentrations (in particular, organic carbon) is established.

5. RECOMMENDATION

This document reviews potential refinements to EPA guidelines for calculating natural background visibility conditions and explores how such refinements are likely to affect calculated rates of progress. Based on the currently available literature on naturally occurring fine particulate matter over the coastal and continental U.S. and a detailed analysis of the error propagation of such refinements on the resulting estimates of natural visibility conditions, changes to the default methods for calculating these conditions will not be undertaken by MANE-VU at this time.

MANE-VU recognizes the simplicity of the default approach and supports future adjustments which better reflect true natural background visibility levels as the science surrounding this issue evolves and more accurate information is available to support such changes. In particular, efforts to reduce the uncertainties associated with estimates of organic carbon, sulfate and coarse mass are most important to pursue through future research activities aimed at improving estimates of natural visibility conditions. Potential refinements investigated in this document including the addition of sea salt, revision of the organic carbon multiplier and improved understanding of the distribution of naturally occurring visibility conditions rank as a second tier set of priorities to be addressed through future research.

Based on this review, MANE-VU proposes to adopt the default estimates at this time, to actively participate in further research efforts on this topic, and to reconsider our position with respect to natural background visibility conditions as future scientific understanding warrants.

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ATTACHMENT L

MANE-VU Baseline and Natural Background Visibility Conditions

BASELINE AND NATURAL BACKGROUND VISIBILITY CONDITIONS

CONSIDERATIONS AND PROPOSED APPROACH TO THE CALCULATION OF BASELINE AND NATURAL BACKGROUND VISIBILITY CONDITIONS AT MANE-VU CLASS I AREAS

Prepared by NESCAUM

December, 2006

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BASELINE AND NATURAL BACKGROUND VISIBILITY CONDITIONS

Considerations and Proposed Approach to the Calculation of Baseline and Natural Background Visibility Conditions at MANE-VU Class I Areas

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1. INTRODUCTION

The long-term visibility conditions that would exist in absence of human-caused impairment are referred to as *natural background* visibility conditions. Accurate assessment of these conditions is important due to their role in determining the uniform rate of progress that states must consider when setting reasonable progress goals for each mandatory Federal Class I area subject to the Regional Haze Rule. Baseline visibility conditions – based on monitored visibility during the five year baseline period (2000-2004) – and estimated natural background visibility conditions will determine the uniform rate of progress states will consider when setting reasonable progress goals for any Class I site.

In September 2001, the U.S. Environmental Protection Agency (EPA) issued draft methodological guidelines for the calculation of natural background and baseline visibility conditions as well as methods for tracking progress relative to the derived uniform rate of progress. EPA subsequently finalized this draft guidance in September 2003. The final guidance recommends a default method and allows for certain refinements that states may wish to pursue in order to make these estimates more representative of a specific Class I area if it is poorly represented by the default method.

In the spring of 2006, the IMPROVE Steering Committee adopted an alternative formulation of the reconstructed extinction equation to address certain aspects of the default calculation method. These aspects were well understood from a scientific perspective and were felt to improve the performance of the equation at reproducing observed visibility at Class I sites. This alternative formulation of the reconstructed extinction equation was not adopted as a replacement to the default method, but as an alternative to the default method for states and RPOs to consider as they proceed with the regional haze planning process. It seems likely that most, if not all, RPOs are considering this alternative formulation as the means by which they will calculate baseline conditions, natural background conditions, and track progress toward the national visibility goals under the Regional Haze Rule.

In this report, MANE-VU reviews the default and alternative approaches to the calculation of baseline and natural background conditions and presents a discussion of the principle differences between the methods. In addition, the default and alternative methods are applied to each Class I area in or near the MANE-VU region in order to establish *differences* in baseline conditions, natural background conditions, and 2018 uniform progress goals under each approach.

The prior MANE-VU position on natural background conditions was issued in June, 2004 and stated that, "Refinements to other aspects of the default method (e.g., refinements to the assumed distribution or treatment of Rayleigh extinction, inclusion of sea salt, and improved assumptions about the chemical composition of the organic fraction) may be warranted prior to submissions of SIPs depending on the degree to which scientific consensus is formed around a specific approach…" Based upon the subsequent reviews conducted by the IMPROVE Steering Committee, as well as internal Technical Steering Committee deliberations, MANE-VU is now ready to adopt the alternative reconstructed extinction algorithm for the reasons described in this report.

2. THE DEFAULT METHOD

The default method is explained in detail in *Estimating Natural Background Visibility Conditions* (U.S.EPA, 2003a) and *Guidance for Tracking Progress under the Regional Haze Rule* (U.S. EPA, 2003b). Summary information is provided here but the reader should consult the original guidance documents for any question on how to apply this method.

Estimates of natural visibility impairment due to fine and coarse particles were derived using the 1990 National Acid Precipitation Assessment Program reported average ambient concentrations of naturally present particles (Trijonis, 1990). Separate concentration values were given for the eastern and western United States; no finer spatial resolution is available. Average natural background light extinction due to particles was then calculated using the IMPROVE methodology and site specific ANNUAL f(RH) values. Worst visibility levels are derived using the work of Ames and Malm (2001), who estimated the standard deviation of visibility in deciviews in the eastern U.S. as 3 dv. By assuming a roughly normal distribution of data, the default method adds (subtracts) 1.28*(3 dv) to the average estimated natural background to calculate the 90^{th} (10^{th}) percentile level, which is taken by EPA to be representative of the mean of the 20 percent worst (best) conditions.

In the East, the default method for calculating best and worst natural background visibility conditions (in dv) for any area in the eastern U.S. uses the following formulae:

$$P90 = HI + 1.28\ sd$$
$$P10 = HI - 1.28\ sd$$

P90 and P10 represent the 90^{th} and 10^{th} percentile, respectively, the Haze Index (HI) represents annual average visibility in units of deciview, and sd is the standard deviation of daily average visibility values throughout a year, defined by the guidance as 3.0 for the eastern U.S. The Haze Index is calculated as shown:

$$HI = 10 \ln (bext/10)$$

The atmospheric extinction, bext, is given by the familiar IMPROVE equation (IMPROVE, 2000) in inverse megameters:

$$bext = (3)f(RH)[sulfate] + (3)f(RH)[nitrate] + (4)[OMC] + (10)[LAC] + (1)[SOIL] + (0.6)[CM] + 10$$

Table 2-1 below provides the default values to be applied at all eastern U.S. Class I areas. The result of using these default values in the above equation with an assumed annual average f(RH) value of 3.17 in the northeastern U.S. (the average of 11 northeastern U.S. sites) is approximately 3.6 dv on the 20 percent best days and 11.3 dv on the 20 percent worst days.

The methods for calculating baseline conditions on the 20 percent best or worst days start by repeating the calculation of the Haze Index (HI) as shown above with the individual species mass concentrations replaced by the actual monitored values for each day during the baseline period. These values should be sorted from highest to lowest for each year in the baseline period. Averages (in dv) for each year can be calculated for HI values associated with the 20 percent most impaired and 20 percent least impaired days. The average HI values for the 20 percent most impaired and 20 percent least impaired days in each year should then be averaged for the five consecutive years 2000-2004 to define baseline conditions. One important distinction between the natural conditions and baseline HI calculations is that the f(RH) values shown in Table 2-2 for natural conditions estimates are annual averages. EPA has also estimated site-specific

Table 2-1. Default parameters used in calculating natural background visibility for sites in the eastern U.S.

Parameter	Value	Fractional Uncertainty	Reference/Comments
[SULFATE]	0.23 $\mu g/m^3$	200%	Trijonis, 1990
[NITRATE]	0.10 $\mu g/m^3$	200%	Trijonis, 1990
[OC]	1.0 $\mu g/m^3$	200%	Trijonis, 1990
[LAC]	0.02 $\mu g/m^3$	250%	Trijonis, 1990
[SOIL]	0.50 $\mu g/m^3$	200%	Trijonis, 1990
[CM]	3.0 $\mu g/m^3$	200%	Trijonis, 1990
f(RH)	~3.2	15%	Varies by site (see Table 2-2)
Organic multiplier	1.4	50%	[OMC]=1.4*[OC]
$\sigma_{S/N}$	3.0 m^2/g	33%	Hegg, 1997; IMPROVE, 2000; Malm, 2000
σ_{OC}	4.0 m^2/g	30%	Hegg 1997; Trijonis 1990
σ_{EC}	10.0 m^2/g	40%	Malm, 1996
σ_{soil}	1.0 m^2/g	25%	Trijonis, 1990
σ_{coarse}	0.6 m^2/g	33%	IMPROVE, 2000
Rayleigh	10 Mm^{-1}	20 %	Varies with altitude/season
sd (standard deviation of daily visibility)	3.0 dv	16%	Ames and Malm, 2001
10^{th}, 90^{th} percentile adjustment	1.28	15%	Regulation calls for mean of top twenty percent, not 90^{th} percentile
Parameters used in potential refinements			
[NaCl]	~0.5	50%	Varies by site, IMPROVE
σ_{NaCl}	2.5 m^2/s	16%	Haywood, 1999
$f(RH)_{NaCl}$	~3.2	33%	Assumed same as S, N

Note: The mass estimates presented above are based on estimates of fine particulate concentrations that would exist in absence of any manmade pollution (including Mexican and Canadian emissions) consistent with planning requirements of the Regional Haze Rule. MANE-VU accepts this as an appropriate planning goal and intends to consider the contribution of international transport in deciding what controls are "reasonable" under the regional haze program.

climatological mean monthly average values of f(RH) that are provided in an appendix to its guidance (EPA, 2003b) and used for the individual HI calculations for baseline conditions.

2.1. Application of the Default Methods

The Class I areas in the MANE-VU region that are subject to the requirements of the Regional Haze Rule are: Acadia National Park, Maine; Brigantine Wilderness (within the Edwin B. Forsythe National Wildlife Refuge), New Jersey; Great Gulf Wilderness, New Hampshire; Lye Brook Wilderness, Vermont; Moosehorn Wilderness (within the Moosehorn National Wildlife Refuge), Maine; Presidential Range – Dry River Wilderness, New Hampshire; and Roosevelt Campobello International Park, New Brunswick. In addition to these Class I areas, we consider several nearby Class I areas where MANE-VU states may be contributing to visibility impairment. These Class I areas include: Dolly Sods Wilderness and the Otter Creek Wilderness in West Virginia as well as Shenandoah National Park and the James River Face Wilderness in Virginia. MANE-VU understands that it is the responsibility of the appropriate VISTAS states to establish estimates of natural visibility conditions and reasonable progress goals for these areas. It is anticipated, however, that subsequent consultations will occur with those MANE-VU states that may be affecting visibility in these areas. MANE-VU has therefore calculated estimates of natural background visibility conditions at the nearby sites using MANE-VU approved methods in order to facilitate future consultations.

The only factor in the default method that varies by site is the climatological annual mean relative humidity adjustment factor. Table 2-2 lists this value for the Class I sites of interest and the resulting best 20 percent and worst 20 percent estimates of natural visibility conditions. The variation among sites using the default method is purely a function of differences in climatological annual mean relative humidity, with southern and coastal sites being more humid than inland or elevated sites.

Table 2-2. Site-specific relative humidity adjustment factors, best and worst (default) estimates of natural background visibility conditions.

MANE-VU Mandatory Federal Class I Area	f(RH)	Best Visibility (dv)	Worst Visibility (dv)
Maine			
Acadia National Park	3.34	3.77	11.45
Moosehorn Wilderness	3.15	3.68	11.36
Roosevelt Campobello International Park, New Brunswick	3.16	3.68	11.37
New Hampshire			
Great Gulf Wilderness	3.01	3.63	11.30
Presidential Range – Dry River Wilderness	3.02	3.65	11.30
New Jersey			
Brigantine Wilderness	2.97	3.60	11.28
Vermont			
Lye Brook Wilderness	2.91	3.57	11.25
Nearby Mandatory Federal Class I Area			
Virginia			
James River Face Wilderness	2.93	3.56	11.26
Shenandoah National Park	2.95	3.57	11.27
West Virginia			
Dolly Sods Wilderness	3.06	3.64	11.32
Otter Creek Wilderness	3.06	3.65	11.32

Table 2-3. Site-specific best and worst (default) estimates of baseline visibility conditions (2000-2004).

MANE-VU Mandatory Federal Class I Area	Best Visibility (dv)	Worst Visibility (dv)
Maine		
Acadia National Park	8.06	22.34
Moosehorn Wilderness	8.48	21.18
Roosevelt Campobello International Park, New Brunswick	8.48	21.18
New Hampshire		
Great Gulf Wilderness	7.50	22.25
Presidential Range – Dry River Wilderness	7.50	22.25
New Jersey		
Brigantine Wilderness	13.72	27.60
Vermont		
Lye Brook Wilderness	6.20	23.70
Nearby Mandatory Federal Class I Area		
Virginia		
James River Face Wilderness	14.35	27.72
Shenandoah National Park	11.34	27.88
West Virginia		
Dolly Sods Wilderness	12.70	27.64
Otter Creek Wilderness	12.70	27.64

3. THE ALTERNATIVE METHOD

According to EPA guidance, "[T]he default approach to estimating natural visibility conditions presented in this document is adequate for the development of progress goals for the first implementation period under the regional haze rule" (U.S. EPA, 2003a). However, the guidance does leave the door open for individual states or RPOs to adopt their own methods for calculating natural background (or baseline conditions) if they can demonstrate that the change from the default represents a significant refinement that better characterizes natural visibility (or baseline) conditions at a specific Class I site.

In response to a number of concerns raised with respect to the use of the default methods for Regional Haze Rule compliance (Lowenthal and Kumar, 2003; Ryan et al., 2005), the IMPROVE Steering Committee established a subcommittee to review the default approach and recommend refinements to address criticisms and improve the performance for tracking progress under the Haze Rule. The details presented below come from that subcommittee's summary report and a review of potential refinements by Hand and Malm (2005).

The recommended revised algorithm is shown in the equation below with revised terms in bold font. The total sulfate, nitrate, and organic carbon compound concentrations are each split into two fractions, representing small and large size distributions of those components. Although not explicitly shown in the equation, the organic mass concentration used in this new algorithm is 1.8 times the organic carbon mass concentration, which is changed from 1.4 times the carbon mass concentration as used for input in the current IMPROVE algorithm. New terms have been added for sea salt (important for coastal locations) and for absorption by NO_2 (only used where NO_2 data are available). Site-specific Rayleigh scattering is calculated for the elevation and annual average temperature of each of the IMPROVE monitoring sites.

$$\begin{aligned}\text{Bext} \approx\ & 2.2 \text{ x } f_S(RH) \text{ x [Small Sulfate]} + 4.8 \text{ x } f_L(RH) \text{ x [Large Sulfate]} + \\ & 2.4 \text{ x } f_S(RH) \text{ x [Small Nitrate]} + 5.1 \text{ x } f_L(RH) \text{ x [Large Nitrate]} + \\ & 2.8 \text{ x [Small Organic Mass]} + 6.1 \text{ x [Large Organic Mass]} + \\ & 10 \text{ x [Elemental Carbon Mass]} + 1 \text{ x [Fine Soil Mass]} + \\ & 1.7 \text{ x } f_{SS}(RH) \text{ x [Sea Salt Mass]} + 0.6 \text{ x [Coarse Mass]} + \\ & \text{Rayleigh Scattering (site specific)} + 0.33 \text{ x } [NO_2 \text{ (ppb)}]\end{aligned}$$

The apportionment of the total concentration of sulfate compounds into the concentrations of the small and large size fractions is accomplished using the following equations.

$$[Large\ Sulfate] = \frac{[Total\ Sulfate]}{20\mu g/m^3} \times [Total\ Sulfate],\ for\ [Total\ Sulfate] < 20\mu g/m^3$$

$$[Large\ Sultate] = [Total\ Sulfate]\ for\ [Total\ Sulfate] \geq 20\ \mu g/m^3$$

$$[Small\ Sulfate] = [Total\ Sulfate] - [Large\ Sulfate]$$

The same equations are used to apportion total nitrate and total organic mass concentrations into the small and large size fractions.

Sea salt is calculated as 1.8 x [*Chloride*], or 1.8 x [*Chlorine*] if the chloride measurement is below detection limits, missing, or invalid. The algorithm uses three water growth adjustment terms as shown in Figure 3-1 and Table 3-1. They are for use with the small size distribution and the large size distribution sulfate and nitrate compounds and for sea salt (*$f_S(RH)$, $f_L(RH)$,* and *$f_{SS}(RH)$,* respectively).

Figure 3-1. Water growth curves for small and large size distribution sulfate and nitrate, sea salt, and the original IMPROVE algorithm sulfate and nitrate.

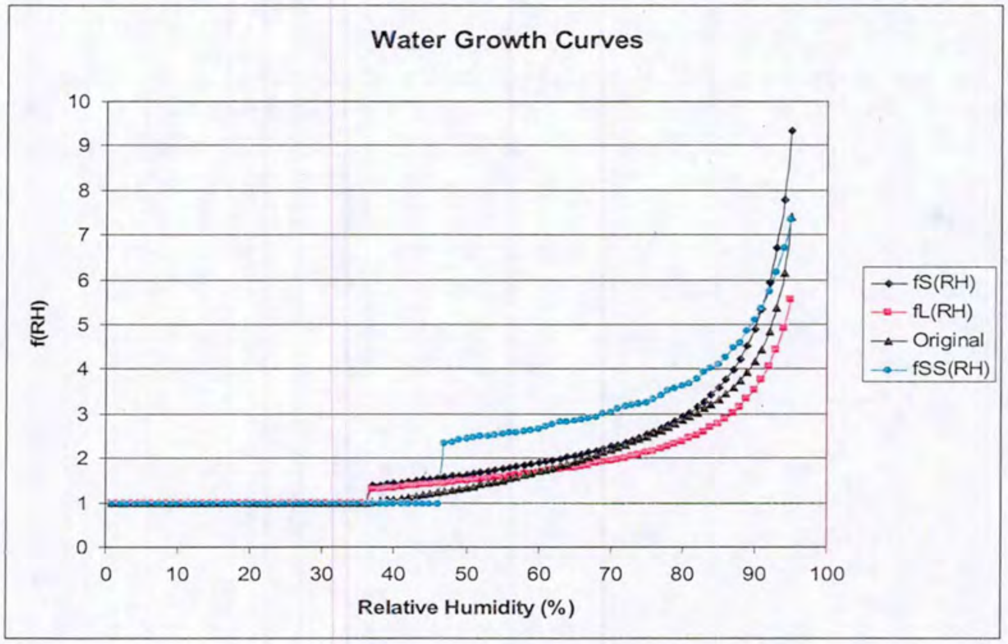

Table 3-1. f(RH) for small and large size distribution sulfate and nitrate, and sea salt.

RH (%)	$f_S(RH)$	$f_L(RH)$	$f_{SS}(RH)$	RH (%)	$f_S(RH)$	$f_L(RH)$	$f_{SS}(RH)$	RH (%)	$f_S(RH)$	$f_L(RH)$	$f_{SS}(RH)$
0 to 36	1.00	1.00	1.00	**56**	1.78	1.61	2.58	**76**	2.60	2.18	3.35
37	1.38	1.31	1.00	**57**	1.81	1.63	2.59	**77**	2.67	2.22	3.42
38	1.40	1.32	1.00	**58**	1.83	1.65	2.62	**78**	2.75	2.27	3.52
39	1.42	1.34	1.00	**59**	1.86	1.67	2.66	**79**	2.84	2.33	3.57
40	1.44	1.35	1.00	**60**	1.89	1.69	2.69	**80**	2.93	2.39	3.63
41	1.46	1.36	1.00	**61**	1.92	1.71	2.73	**81**	3.03	2.45	3.69
42	1.48	1.38	1.00	**62**	1.95	1.73	2.78	**82**	3.15	2.52	3.81
43	1.49	1.39	1.00	**63**	1.99	1.75	2.83	**83**	3.27	2.60	3.95
44	1.51	1.41	1.00	**64**	2.02	1.78	2.83	**84**	3.42	2.69	4.04
45	1.53	1.42	1.00	**65**	2.06	1.80	2.86	**85**	3.58	2.79	4.11
46	1.55	1.44	1.00	**66**	2.09	1.83	2.89	**86**	3.76	2.90	4.28
47	1.57	1.45	2.36	**67**	2.13	1.86	2.91	**87**	3.98	3.02	4.49
48	1.59	1.47	2.38	**68**	2.17	1.89	2.95	**88**	4.23	3.16	4.61
49	1.62	1.49	2.42	**69**	2.22	1.92	3.01	**89**	4.53	3.33	4.86
50	1.64	1.50	2.45	**70**	2.26	1.95	3.05	**90**	4.90	3.53	5.12
51	1.66	1.52	2.48	**71**	2.31	1.98	3.13	**91**	5.35	3.77	5.38
52	1.68	1.54	2.50	**72**	2.36	2.01	3.17	**92**	5.93	4.06	5.75
53	1.71	1.55	2.51	**73**	2.41	2.05	3.21	**93**	6.71	4.43	6.17
54	1.73	1.57	2.53	**74**	2.47	2.09	3.25	**94**	7.78	4.92	6.72
55	1.76	1.59	2.56	**75**	2.54	2.13	3.27	**95**	9.34	5.57	7.35

The proposed new algorithm for estimating haze reduces the biases compared to measurements at the high and low extremes. This is most apparent for the hazier eastern sites. The composition of days selected as best and worst by the current and the new algorithm are very similar, and similar to days selected by measurements. Most of the reduction of bias associated with the new algorithm is attributed to the use of the split component extinction efficiency method for sulfate, nitrate, and organic components that permitted variable extinction efficiency depending on the component mass concentration. Although not subject to explicit performance testing, the proposed new algorithm also contains specific changes from the current algorithm that reflect a better understanding of the atmosphere as reflected in the more recent scientific literature (e.g., change to 1.8 from 1.4 for organic compound mass to carbon mass ratio) and a more complete accounting for contributors to haze (e.g., sea salt and NO_2 terms), and use of site specific Rayleigh scattering terms to reduce elevation-related bias.

Unlike the default approach, which directly uses the Trijonis natural species concentration estimates to calculate natural haze levels, the Alternative Approach uses the baseline data (current species concentrations) with a multiplier applied to each species measurement in order to give the Trijonis estimate for that species. The ratio of the Trijonis estimates for each species divided by the annual mean values for the species is used to transform the entire data set to what is then assumed to be the natural species concentration levels for that site and year. This process is applied to each of the complete years of data (as defined by the EPA *tracking progress* guidance) in the baseline period (2000 through 2004). Sites with three complete years of data are treated as having sufficient data for this assessment. If any of the current annual means for any species is less than the Trijonis estimate for that species, the unadjusted species data are used. Trijonis estimates did not include sea salt, which is only significant at a few coastal sites. Estimates of current sea salt concentrations determined from Cl^- ion data (described as part of the new IMPROVE algorithm) are taken to be natural contributors to haze.

3.1. Application of the Alternative Method

Here we present a comparison of the background and natural visibility conditions calculated using the default and the alternative methods (see Table 3-2 and Table 3-3). Corresponding visibility improvement targets for 2018 using each approach are also presented (see Table 3-3). Results suggest that the alternative approach leads to very similar uniform rates of progress in New England with slightly greater visibility improvement required in the Mid-Atlantic region relative to the default approach.

Table 3-2. Comparison of default and alternative approaches for estimating the 20 percent worst natural background visibility conditions at MANE-VU and nearby sites (2000-2004).

MANE-VU Mandatory Federal Class I Area	Default Baseline dv	Alternative Baseline dv	Default Natural dv	Alternative Natural dv
Maine				
Acadia National Park	22.34	22.89	11.45	12.43
Moosehorn Wilderness	21.18	21.72	11.36	12.01
Roosevelt Campobello International Park, New Brunswick	21.18	21.72	11.37	12.01
New Hampshire				
Great Gulf Wilderness	22.25	22.82	11.30	11.99
Presidential Range – Dry River Wilderness	22.25	22.82	11.30	11.99
New Jersey				
Brigantine Wilderness	27.60	29.01	11.28	12.24
Vermont				
Lye Brook Wilderness	23.70	24.45	11.25	11.73
Nearby Mandatory Federal Class I Areas				
Virginia				
James River Face Wilderness	27.72	29.12	11.26	11.13
Shenandoah National Park	27.88	29.31	11.27	11.35
West Virginia				
Dolly Sods Wilderness	27.64	29.04	11.32	10.39
Otter Creek Wilderness	27.64	29.04	11.32	10.39

Table 3-3. Estimated uniform rates of progress (ROP) (to be considered for worst 20 percent days) and Best Day Baseline Conditions (not to be degraded on best 20 percent days) for first implementation period.

MANE-VU Mandatory Federal Class I Area	Default ROP Worst day (dv/14 yrs)	Alternative ROP Worst day (dv/14 yrs)	Default Baseline Visibility Best Day (dv)	Alternative Baseline Visibility Best Day (dv)
Maine				
Acadia National Park	2.54	2.44	8.06	8.77
Moosehorn Wilderness	2.29	2.27	8.48	9.15
Roosevelt Campobello International Park, New Brunswick	2.29	2.27	8.48	9.15
New Hampshire				
Great Gulf Wilderness†	2.56	2.53	7.50	7.66
Presidential Range – Dry River Wilderness†	2.56	2.53	7.50	7.66
New Jersey				
Brigantine Wilderness‡	3.81	3.91	13.72	14.33
Vermont				
Lye Brook Wilderness	2.91	2.97	6.20	6.36
Nearby Mandatory Federal Class I Area				
Virginia				
James River Face Wilderness[n]	3.84	4.20	14.35	14.21
Shenandoah National Park‡	3.88	4.19	11.34	10.93
West Virginia				
Dolly Sods Wilderness	3.81	4.35	12.70	12.28
Otter Creek Wilderness	3.81	4.35	12.70	12.28

Note: The values are presented for the default and alternative approaches at MANE-VU and nearby sites (2000-2004).

The default estimates provide a sound, nationally consistent framework on which to base the regulatory structure of the Haze Rule that is justified by the current state of scientific understanding of these issues. However, an alternative approach for the calculation of reconstructed extinction under the Regional Haze Rule has been developed that provides all of the same advantages. EPA recommendations on potential refinements to the default approach (Pitchford, personal communication, 2004) suggest that, if used, any refinements should be broadly accepted by the scientific community, substantial, practical to implement, and not create arbitrary inconsistencies. The alternative approach endorsed by the IMPROVE Steering Committee for baseline and natural background conditions meet these requirements.

4. RECOMMENDATIONS

This document reviews EPA guidelines and an IMPROVE Steering Committee-endorsed alternative for calculating baseline and natural background visibility conditions under the Regional Haze Rule. It also explores how adoption of the alternative approach would affect calculated rates of progress and other regulatory drivers under the Haze Rule.

The alternative approach attempts to incorporate better science for several components of the equation to calculate reconstructed extinction that reflects the latest scientific research. MANE-VU recognizes the time and effort that has been invested in the development of this alternative. We also recognize the high likelihood that other RPOs will adopt and use the alternative approach and consider it desirable to use a similar approach to other RPOs with which MANE-VU will consult on visibility goals. Given the large uncertainties that remain in our ability to estimate the concentrations of organic carbon and other species that would be present in the absence of anthropogenic influences, we are not certain that the alternative approach significantly improves the overall accuracy of the estimated natural background conditions, but it certainly does not diminish the accuracy and is likely to improve our estimates of baseline conditions.

Finally, MANE-VU has considered the fact that the uniform rate of progress that results from these calculations is a relatively arbitrary baseline against which progress is measured. This Haze Rule requires states to consider this uniform rate, but control decisions are to be based on a four-factor analysis that is independent of the uniform rate of progress. The relatively small differences in the uniform rate that are introduced as a result of using the alternative approach further diminish the significance of this decision. Based on all of the considerations above, MANE-VU recommends adoption of the alternative approach for use in 2008 MANE-VU SIP submittals, active participation in further research efforts on this topic, and future reconsideration of natural background visibility conditions as evolving scientific understanding warrants.

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Attachment M

Technical Support Document for 2002 MANE-VU SIP Modeling Inventories, Version 3

TECHNICAL SUPPORT DOCUMENT FOR 2002 MANE-VU SIP MODELING INVENTORIES, VERSION 3

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November 20, 2006

for the
Mid-Atlantic/Northeast Visibility Union (MANE-VU)

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CONTENTS

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FIGURES

ACRONYMS AND ABBREVIATIONS

ATP	Anaerobic Thermal Processor
BEIS	Biogenic Emissions Inventory System
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CAMD	Clean Air Markets Division
CAP	criteria air pollutant
CE	Control Equipment (NIF 3.0) table
CEM	Continuous Emissions Monitoring
CENRAP	Central Regional Air Planning Organization
CERR	Consolidated Emissions Reporting Rule
CMU	Carnegie Mellon University
CNG	compressed natural gas
CO	carbon monoxide
CO_2	carbon dioxide
EF	emission factor
EFIG	Emission Factors and Inventory Group
EGU	electricity generating unit
EI	inventory
EM	Emission (NIF 3.0) table
EP	Emission Process (NIF 3.0) table
EPA	U.S. Environmental Protection Agency
ERP	Emission Release Point (NIF 3.0) table
ETBE	ethyl tertiary butyl ether
ETOH	ethanol
ETS	Emission Tracking System
EU	Emission Unit (NIF 3.0) table
FIPS	Federal Information Processing Standard
FIRE	Factor Information and REtrieval Factor
GIS	geographic information system
GSE	ground support equipment
HAP	hazardous air pollutant
HC	hydrocarbon
HPMS	Highway Performance Monitoring System
ID	identification
IDA	Inventory Data Analyzer format
I/M	inspection and maintenance
km	kilometer
LAI	leaf area indices
LEV	low emission vehicle
LPG	liquified petroleum gas
MACT	maximum achievable control technology
MANE-VU	Mid-Atlantic/Northeast Visibility Union
MARAMA	Mid-Atlantic Regional Air Management Association
MTBE	methyl tertiary butyl ether
NAAQS	National Ambient Air Quality Standard
NAICS	North American Industrial Classification System

NEI	National Emissions Inventory
NH_3	ammonia
NIF	NEI Input Format
NMIM	National Mobile Inventory Model
NO	nitrous oxide
NO_x	oxides of nitrogen
NYSDEC	New York State Department of Environmental Conservation
ORIS	Office of Regulatory Information Systems
OTC	Ozone Transport Commission
PAR	photosynthetic active radiation
PE	Emission Period (NIF 3.0) table
Pechan	E.H. Pechan & Associates, Inc.
PFC	portable fuel container
PM	particulate matter
PM-CON	condensible PM
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PM10-FIL	filterable PM_{10}
PM10-PRI	primary PM_{10}
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM25-FIL	filterable $PM_{2.5}$
PM25-PRI	primary $PM_{2.5}$
POTWs	public owned treatment works
ppm	parts per million
psi	pounds per square inch
QA	quality assurance
QAPP	Quality Assurance Project Plan
RPO	Regional Planning Organization
RVP	Reid vapor pressure
SCC	Source Classification Code
SPDPRO	speed profile
SPDREF	speed cross reference
SI	Site (NIF 3.0) table
SIC	Standard Industrial Classification
SIP	State Implementation Plan
S/L	State and Local
SMOKE	Sparse Matrix Operator Kernel Emissions
SO_2	sulfur dioxide
TAME	tertiary amyl methyl ether
TR	Transmittal (NIF 3.0) table
TSD	technical support document
U.S.	United States
VISTAS	Visibility Improvement State and Tribal Association of the Southeast
VMT	vehicle miles traveled
VOC	volatile organic compound
WRAP	Western Regional Air Partnership

CHAPTER I – INTRODUCTION

A. What is the purpose of this TSD?

This technical support document (TSD) explains the data sources, methods, and results for preparing Version 3 of the 2002 base year criteria air pollutant (CAP) and ammonia (NH_3) emissions inventories for point, area, onroad, nonroad, and biogenic sources for the Mid-Atlantic/Northeast Visibility Union (MANE-VU) Regional Planning Organization (RPO). The MANE-VU region includes Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. Local air planning agencies include Philadelphia and Allegheny County, Pennsylvania. The region also includes the Penobscot Tribe of Maine Indian Nation (Tribal code 018) and the St. Regis Band of Mohawk Indians of New York (Tribal code 007). However, these tribal authorities did not provide any data for the 2002 MANE-VU inventory. MANE-VU will use these inventories to support air quality modeling, State Implementation Plan (SIP) development, and implementation activities for the regional haze rule and fine particulate matter (PM) and ozone National Ambient Air Quality Standards (NAAQS).

The inventories and supporting data prepared include the following:

(1) Comprehensive, county-level, mass emissions and modeling inventories for of 2002 emissions for CAPs and NH_3 for the State and Local (S/L) agencies included in the MANE-VU region;
(2) The temporal, speciation, and spatial allocation profiles for the MANE-VU region inventories;
(3) Inventories for wildfires, prescribed burning, and agricultural field burning for the southeastern provinces of Canada; and
(4) Inventories for other RPOs, Canada, and Mexico.

The mass emissions inventory files were prepared in the National Emissions Inventory (NEI) Input Format Version 3.0 (NIF 3.0). The modeling inventory files were prepared in Sparse Matrix Operator Kernel Emissions/Inventory Data Analyzer (SMOKE/IDA) format. Ancillary files (holding spatial, temporal, and speciation profile data) were prepared in SMOKE/IDA compatible format. Figure 1 shows the Models-3 Community Multiscale Air Quality Modeling System (CMAQ) modeling domain for the MANE-VU region.

The inventories include annual emissions for sulfur dioxide (SO_2), oxides of nitrogen (NO_x), volatile organic compounds (VOC), carbon monoxide (CO), NH_3, and particles with an aerodynamic diameter less than or equal to a nominal 10 and 2.5 micrometers (i.e., primary PM_{10} and $PM_{2.5}$). The inventories included summer day, winter day, and average day emissions. However, not all agencies included daily emissions in their inventories, and, for the agencies that did, the temporal basis for the daily emissions varied between agencies. The temporal profiles prepared for this project will be used to calculate daily emissions when not available in the inventory files.

Figure 1. MANE-VU 12-Kilometer CMAQ Modeling Domain

B. What are Versions 1, 2, and 3 of the 2002 MANE-VU Inventory?

Work on Version 1 of the 2002 MANE-VU inventory began in April 2004. The consolidated inventory for point, area, onroad, and nonroad sources was prepared by starting with the inventories that S/L agencies submitted to the United States (U.S.) Environmental Protection Agency (EPA) from May through July of 2004 as a requirement of the Consolidated Emissions Reporting Rule (CERR). The EPA's format and content quality assurance (QA) programs (and other QA checks not included in EPA's QA software) were run on each inventory to identify format and/or data content issues (EPA, 2004a). E.H. Pechan & Associates, Inc. (Pechan) worked with the MANE-VU S/L agencies and the staff of the Mid-Atlantic Regional Air Management Association (MARAMA) to resolve QA issues and augment the inventories to fill data gaps in accordance with the Quality Assurance Project Plan (QAPP) prepared for this project (MANE-VU, 2004a). MARAMA is the MANE-VU organization's employees, whereas

MANE-VU is the member S/L agencies plus MARAMA employees. MARAMA is one of three RPOs (in addition to Ozone Transport Commission (OTC) and North East States for Coordinated Air Use Management) supporting the MANE-VU effort.

A draft of the point and area source inventories and summary files were provided for stakeholder review during August 2004. Stakeholder comments were reviewed by the S/L agencies and revisions to the inventory files were made to the files to incorporate stakeholder comments as approved by each S/L agency. The inventories were finalized during December 2004 and the SMOKE input files were prepared and reviewed by the modelers during December 2004 and early January 2005. The final inventory and SMOKE input files were finalized during January 2005.

Work on Version 2 (covering the period from April through September 2005) involved incorporating revisions requested by some S/L agencies on the point, area, and onroad inventories. Work on Version 3 (covering the period from December 2005 through April 2006) included additional revisions to the point, area, and onroad inventories as requested by some states. Thus, the Version 3 inventory for point, area, and onroad sources were built upon Versions 1 and 2. This work also included development of the biogenics inventory. Version 3 of the nonroad inventory was completely redone due to changes that EPA made to the NONROAD2005 model.

C. How is this TSD organized?

Chapters II through V of this TSD present the general and State-specific methods and data sources used to develop Version 3 of MANE-VU's 2002 inventory for point, area, nonroad, and onroad sources. Chapter VI presents the methods, data sources, and model used to develop the biogenics inventory. Chapter VII documents the temporal allocation, speciation, and spatial allocation modeling input files used for Version 3 of MANE-VU's 2002 inventory for all sectors. Chapter VIII describes the non-MANE-VU region inventory data used for MANE-VU BaseB Modeling. References for the TSD are provided in Chapter IX. Appendices A and B provide the QA Summary Report files prepared during development of the State-specific inventories for point and area sources, respectively. Appendices A and B also provide tables that identify for each S/L agency, the Version 3 data sources, emission type period, pollutant, and the number of counties by source classification code (SCC). For the nonroad inventory, Appendix C provides the final county, monthly National Mobile Inventory Model (NMIM) inputs provided or confirmed by the States for Reid vapor pressure (RVP), weight percent oxygen, and gasoline sulfur.

CHAPTER II – POINT SOURCES

A. General Methods for all State and Local Agencies

1. What Data Sources Were Used?

Version 3 of the 2002 MANE-VU point source inventory is based primarily on Version 1 with some state-specific revisions incorporated into Versions 2 and 3. Version 1 was developed using the inventories that S/L agencies submitted to EPA from May through July of 2004 as a requirement of the CERR. All 12 State agencies submitted point source inventories to EPA. In addition, Allegheny and Philadelphia Counties in Pennsylvania each submitted their own point source inventories to EPA. The EPA performed some limited QA review of the S/L inventories to identify format, referential integrity, and duplicate record issues. The EPA revised the inventories to address these issues and made the files available to the S/L agencies on August 6, 2004. These inventory files were used as the starting point for Version 1 of the MANE-VU inventory. These inventory files were obtained from EPA, consolidated into a single data set, subjected to extensive QA review, revised (as approved by the MANE-VU S/L agencies) to address QA issues and to fill data gaps identified while preparing Version 1. Subsequently, the following agencies provided revisions to their point source inventories:

- Version 2 – Connecticut, Delaware, and Maryland
- Version 3 – Massachusetts, New York, and Rhode Island

The revisions that these states provided for Versions 2 and 3 are discussed in the "State-Specific Methods" section of this chapter.

In order to track the origin of data, the temporal period of emissions, and to facilitate generation of emission summaries, the following NIF plus fields were added to the Transmittal (TR), Site (SI), Emission Unit (EU), Emission Release Point (ER), Emission Process (EP), Emission Period (PE), Emission (EM), and Control Equipment (CE) tables:

- Data Source Codes:

Code	Description
S	State agency-supplied data.
L	Local agency-supplied data to incorporate S/L comments for individual records.
P	NH_3 emissions from MANE-VU inventory for cement kilns.
AUG-A	PM Augmentation: ad-hoc change.
AUG-C	PM Augmentation: standard augmentation method.
AUG-O	PM Augmentation: set PMxx-FIL = PMxx-PRI for SCCs starting with 10 (external fuel combustion) and 20 (internal fuel combustion). Note: emission factors and particle-size data for estimating condensible emissions for fuel combustion SCCs starting with 30 were not available; therefore, condensible emissions were not estimated for these processes

if an agency provided filterable and not primary emissions for these processes. In other words, the primary emissions were assumed to equal the filterable emissions.

AUG-Z PM Augmentation: automated fill-in of zero values where all PM for a particular process is zero.

- Revision Date: This field indicates the month and year during which the last revision was made to a record.

- State Federal Information Processing Standard (FIPS): This field indicates the state FIPS code of the submittal.

- County FIPS: This field indicates the county FIPS code of the submittal.

The following NIF plus fields were added to the EM table:

- Emission Ton Value: This field indicates the values of the emissions in tons. This field was used to prepare summaries of emissions on a consistent EU basis.

- Emission Type Period: This field indicates the period of the Emission Type – either ANNUAL or NONANNUAL. This field was used to prepare summaries of annual emissions.

- CAP_HAP: This field identifies records for CAP versus records for hazardous air pollutants (HAPs). For the MANE-VU inventory, the flag is CAP for all records.

- Year: This field indicates the year of the data; for this inventory, it is 2002.

Note that the QAPP for Version 1 includes more data source codes than were used in Version 3 of the point source inventory. The data source codes listed above are the codes used in Version 3. The exception is for Rhode Island, who requested that their Version 2 inventory be replaced with its inventory included in the final 2002 NEI prepared by EPA. Thus, for Rhode Island, it was agreed to maintain the data source codes used in the NEI in Version 3 of the MANE-VU inventory. The data source codes for Rhode Island's point source inventory are explained under the state-specific section for Rhode Island.

2. What Quality Assurance Steps Were Performed?

A QAPP was prepared and approved by MANE-VU/MARAMA and the EPA Regional Office prior to initiating work on Version 1 of the inventory (MANE-VU, 2004a). This QAPP was followed during preparation of all three versions of the inventory. This section provides an overview of the QA checks completed on each version of the inventory. The QA process for each S/L inventory involved the following steps:

- Conduct QA checks on each S/L inventory;
- Prepare a QA Summary Report for submittal to the agency for review;

- Revise the inventory to resolve QA issues as directed by the agency;
- Repeat the QA checks on the revised inventory to verify that the corrections were completed;
- Perform augmentation to correct for missing data; and
- Repeat the QA checks to verify that the augmentation was completed correctly.

a. QA checks for S/L agency inventories

The following discusses the QA diagnoses that were run on the consolidated point source inventory data set. For each S/L agency, a "QA Summary Report" was prepared for each QA check in an Excel Workbook file. The results of each QA check was summarized in a separate spreadsheet and submitted to the S/L agency for review and resolution. The agencies provided corrections to the data in the Excel files or via e-mail and the inventory was updated with the corrections.

i. Continuous Emissions Monitoring (CEM) Analysis

The goal of this analysis was to compare annual NO_x and SO_2 emissions that were measured with CEM systems and reported to EPA to the annual NO_x and SO_2 emissions reported in the S/L inventories. Facilities report hourly CEM data to EPA for units that are subject to CEM reporting requirements of the NO_x SIP Call rule and Title IV of the Clean Air Act (CAA). Thus, hourly CEM emissions were summed to the annual level and compared to the annual emissions in the S/L inventories. If the S/L agencies agreed, the CEM hourly emissions would be used to support air quality modeling to accurately reflect the temporal distribution of emissions from CEM units during 2002. Since some of the states require facilities to certify the emissions they report for inclusion in the inventory, the agencies needed proof that the emissions in the CEM inventory compared well with the emissions in the S/L inventory.

The 2002 CEM inventory containing hourly NO_x and SO_2 emissions and heat input data were downloaded from the EPA/Clean Air Markets Division's (CAMD) web site (www.epa.gov/airmarkets) on July 8, 2004 (CAMD, 2004). The data were provided by quarter and state resulting in 48 separate files for the 12 states in the MANE-VU region. For each state, the hourly emissions were summed to the annual level by facility and EU.

The first stage in the CEM analysis involved preparing a crosswalk file to match facilities and units in the CEM inventory to facilities and units in the S/L inventories. In the CEM inventory, the Office of Regulatory Information Systems (ORIS) identification (ID) code identifies unique facilities and the unit ID identifies unique boilers and internal combustion engines (i.e., turbines and reciprocating engines). In the S/L inventories, the state and county FIPS and state facility ID together identify unique facilities and the EU ID identifies unique boilers or internal combustion engines. However, in some of the S/L inventories, the emissions for multiple EUs were summed and reported under the same EU ID. Thus, an Excel Workbook was sent to the S/L agencies that contained an initial crosswalk with the ORIS ID and unit ID in the CEM inventory matched to the state and county FIPS, state facility ID, and EU ID in the S/L inventory. Agencies were asked to confirm/correct/supplement the information in the crosswalk. The initial crosswalk also contained annual emissions summed from the hourly CEM emissions and flags that indicated if

CEM units were subject to reporting requirements under the NO_x SIP Call and/or Title IV of the CAA. It should be noted that the initial matching of the IDs in both inventories was based on previous crosswalks that had been developed for the 1999 NEI and in-house information compiled by Pechan. The matching at the facility level was nearly complete; however, S/L agency assistance was needed to match most of CEM units to EUs in the S/L inventories.

The crosswalk was updated with corrections to facility and CEM unit-to-EU matches, and with new matches provided by the S/L agencies. The matching of each CEM unit to an EU was still incomplete. Consequently, the comparison of annual emissions was performed at the facility level.

The second stage in the CEM analysis was to prepare an Excel Workbook file for each S/L agency that compared the annual emissions summed from the hourly CEM inventory to the annual emissions reported in the S/L inventory. The file included three spreadsheets that compared annual emissions at the facility level, listed the facilities in the CEM inventory that could not be matched to the facilities in the S/L inventory, and listed the facilities in the S/L inventory identified as an electricity generating unit (EGU) that could not be matched to a facility in the CEM inventory. The Excel files were sent to the S/L agencies for review. The S/L agencies then indicated if they did or did not want to use the hourly CEM inventory.

The facility-level comparison of CEM to emission inventory NO_x and SO_2 emissions found that for some facilities, the annual emissions from the S/L inventory exceeded the CEM annual emissions because the facility in the S/L inventory contained more than just CEM units. This condition was determined to be acceptable. However, S/L agencies were asked to review data for facilities where the CEM emissions were higher than the emissions summed from the S/L inventory. For these cases, CEM emissions may be higher than those reported in a S/L inventory due to methods EPA uses for using artificially high default values to fill in hourly CEM data when not reported or when a CEM unit was not working properly.

After reviewing the comparison of the CEM to S/L inventory emissions, New York and Vermont elected to use the 2002 CEM inventory containing hourly NO_x and SO_2 emissions for all facilities. Maryland; New Hampshire; and Allegheny County, Pennsylvania elected to use the 2002 CEM data for some but not all of the facilities within their jurisdiction. The Excel Workbook files containing the comparison of CEM to S/L inventories provides a spreadsheet identifying the facilities for which these S/L agencies elected to use the CEM inventory.

Subsequent to the completion of this analysis, it was determined that the structure of the EPA/CAMD file would not be compatible with the format of the SMOKE input file. The database structure did not affect the annual emissions summed from the hourly CEM emissions used in the comparison to S/L inventory data. For each of the S/L agencies that elected to use the 2002 CEM data, CAMD agreed to provide separate database files for each state with a structure compatible with the SMOKE input file format. Pechan then used the crosswalk to add to the CEM inventory files the state and county FIPS, state facility ID, and EU ID (if the crosswalk contains a CEM unit to EU match) to the hourly CEM database files provided by CAMD. The modified database was then used to create the SMOKE input files for these states.

Note that Delaware requested that the 2002 CEM inventory for its facilities not be used for regional haze modeling. However, if the consolidated point source inventory prepared under this project is used to support ozone episode modeling, Delaware may consider using the CEM hourly data for the episodes modeled. Therefore, the 2002 CEM inventory was also processed for Delaware's facilities.

ii. PM Emissions Consistency and Completeness Review

The following consistency checks were performed at the EM table data key level (for annual emissions) to compare PM emissions:

- If a process was associated with a PM emission record, but was missing one or more of the following (as appropriate for the SCC [i.e., condensible PM (PM-CON) is associated with fuel combustion only]): filterable PM_{10} (PM10-FIL), primary PM_{10} (PM10-PRI), filterable $PM_{2.5}$ (PM25-FIL), primary $PM_{2.5}$ (PM25-PRI), or PM-CON, the record was flagged for review.

- The following equations were used to determine consistency:

  PM10-FIL + PM-CON = PM10-PRI
  PM25-FIL + PM-CON = PM25-PRI
  PM-FIL + PM-CON = PM-PRI

- The following comparisons were applied to determine consistency:

  PM10-PRI >= PM10-FIL
  PM25-PRI >= PM25-FIL
  PM10-PRI >= PM-CON
  PM25-PRI >= PM-CON
  PM10-FIL >= PM25-FIL
  PM10-PRI >= PM25-PRI
  PM-PRI >= PM10-PRI
  PM-PRI >= PM25-PRI
  PM-FIL >= PM10-FIL
  PM-FIL >= PM25-FIL

If the data failed one of these checks it was diagnosed as an error, summarized in an Excel Workbook file, and provided to the S/L agency for corrections. If a S/L agency did not provide corrections to these errors, the errors were corrected or filled in according to the augmentation procedures.

iii. ERP Coordinate Review

Location coordinates for point sources were evaluated using geographic information system (GIS) mapping to determine if the coordinates were within 0.5-kilometers of the boundary of the county in which the source was located. If not, the S/L agency was asked to review the coordinates and provide corrections to either the coordinates or the state and county FIPS codes. The 0.5-kilometer test resulted in a large number of ERPs for review by the agencies. Therefore, to assist S/L agencies in prioritizing their review of coordinates, ERP records with coordinates located more than 0.5, 1, 2, 3, 5, 7, and 10 or more kilometers from their county boundary, and coordinates that mapped outside of their state boundary were identified. Annual emissions summed to the ERP level were included in the QA Summary Report to identify records with zero emissions for all pollutants and to identify the highest emitting stacks. The QA Summary Report was provided to the S/L agency for review and corrections.

iv. ERP Parameter Review

The EPA's QA guidance for diagnosing ERP issues for the point source NEI (EPA, 2004b) was applied to identify QA issues in the S/L point source inventories. The QA guidance involved diagnosing the correct assignment of the ERP type (i.e., stack or fugitive), parameters with zero values, parameters not within the range of values specified in the EPA's QA procedures, and consistency checks (i.e., comparing calculated values against the values reported in the inventory). In many cases errors were caused by missing or zero values. In other cases, out-of-range errors were caused by unit conversion issues (e.g., stack parameters were in ft, ft/sec, cu ft/sec, or degrees Fahrenheit). The QA issues were summarized in a separate QA Summary Report for each agency and each agency was asked to provide corrections. If an agency did not provide corrections for out-of-range or missing values, the data were corrected or filled in according to the ERP augmentation procedures.

v. Control Device Type and Control Efficiency Data Review

The CE codes in the "Primary Device Type Code" and "Secondary Device Type Code" fields were reviewed to identify invalid codes (i.e., codes that did not exist in the NIF 3.0 reference table) and missing codes (e.g., records with a null or uncontrolled code of 000 but with control efficiency data).

QA review of control efficiency data involved diagnosis of two types of errors. First, records were reviewed to identify control efficiency values that were reported as a decimal rather than as a percent value. Records with control efficiencies with decimal values were flagged as a potential error (although not necessarily an error, since the real control efficiency may be less than 1%).

The second check identified records where 100% control was reported in the CE table, but the emissions in the EM table were greater than zero and the rule effectiveness value in the EM table was null, zero, or 100% (implying 100% control of emissions). Because many agencies did not populate the rule effectiveness field or a default value of zero was assigned, records with null or zero rule effectiveness values were included where the CE was 100% and emissions were greater than zero. The records that met these criteria were summarized in a QA Summary Report for review and correction, if necessary, by the S/L agency.

vi. Start and End Date Checks

QA review was conducted to identify start date and end date values in the PE and EM tables to confirm consistency with the inventory year in the TR table, and to confirm that the end date reported was greater than the start date reported. This check did not identify any QA issues in the three versions of the inventory.

vii. Annual and Daily Emissions Comparison

The following QA checks were conducted to identify potential errors associated with the incorrect reporting of daily and/or annual emissions:

- Any "DAILY" type record that is greater than its associated "ANNUAL".

A review of the daily vs. annual comparison revealed that in many cases, the daily value was nonzero (but very small), but the annual value was zero. This was generally a result of rounding in a S/L agency's original emissions database, where annual records were recorded in tons per year to a set number of decimal places, while the corresponding daily records were recorded in pounds per year to a set number of decimal places. The annual record rounds to zero in the original database, while the daily value remains non-zero. A tolerance check reveals the following (comparison in tons):

- Difference Tolerance (daily - annual)> 0
- Difference Tolerance (daily - annual)> .000001
- Difference Tolerance (daily - annual)> .00001
- Difference Tolerance (daily - annual)> .0001
- Difference Tolerance (daily - annual)> .001
- Difference Tolerance (daily - annual)> .01

For Version 1, the affected S/L agencies were as follows:

- Connecticut (09) 11 records
- Maine (23) 4 records
- Maryland (24) 72 records
- New Jersey (34) 2935 records
- Pennsylvania Allegheny County (42003) 17 records
- Pennsylvania Philadelphia County (42101) 146 records
- Rhode Island (44) 1 record

Rhode Island, Philadelphia, and New Jersey responded that the dailies that were greater than the annuals could be deleted. Maryland determined that they should be kept since the difference values were small. The records for the remaining S/L agencies were kept. This QA issue only occurred during processing of Version 1.

b. Responses from S/L agencies

Each S/L agency reviewed its "QA Summary Report" files and the S/L agency provided direction for correcting QA issues either in the QA Summary Report Excel files or via e-mail. The inventory was then revised to incorporate responses from each agency and the QA checks were run again to verify that the QA issues were addressed. If an agency responded to a QA issue by e-mail, the direction was recorded in the "QA Summary Report" file. The "QA Summary Report" file for each S/L agency was updated to document QA issues and resolution of issues associated with developing Versions 2 and 3 of the point source inventory. The "QA Summary Report" files for Version 3 are provided with this report in a separate zip file. The files in the zip file are organized in separate folders for each S/L agency. Each folder includes a separate Excel workbook file for the following QA checks if a QA issue existed:

- PM Augmentation QA Summary;
- Stack Parameter QA Summary;
- Stack Coordinates QA Summary;
- Stack Parameter and Coordinate Augmentation Summary;
- CEM Comparisons and Revisions; and
- Control Device/Efficiency Summary.

c. Gap Filling and Augmentation

The following discusses the augmentation procedures that were used to fill in missing data that were not supplied by the S/L agencies. The S/L agencies approved the procedures before they were applied. These procedures were applied after revising the inventory to address QA issues as directed by each S/L agency.

i. MANE-VU-Sponsored Inventories

MANE-VU prepared a 2002 NH_3 emissions inventory for cement kilns for SCCs 30500606 and 30500706 located in four MANE-VU states. Maryland chose to add one new facility 24013/0012 (state and county FIPS code/facility ID). New York chose to add the following three sites 36001/4010300016, 36001/4012400001, and 36111/3514800084. Maine and Pennsylvania chose not to add emissions from this inventory. The data for Maryland and New York were added to Version 1. These data were not changed in Versions 2 and 3 of the point source inventory.

ii. PM Augmentation

The PM augmentations process gap-fills missing PM pollutant complements. For example, if a S/L agency provided only PM10-PRI pollutants the PM augmentation process filled in the PM25-PRI pollutants. The steps in the PM augmentation process were as follows:

- Step 1: Initial QA and remediation of S/L provided PM pollutants;

- Step 2: Development of PM factor ratios based on factors from the Factor Information and REtrieval (FIRE) Data System, version 6.2, and the PM Calculator (EPA, 2003a; EPA, 2004c);
- Step 3: Implementation of the ratios developed in step 2.; and
- Step 4: Presentation of PM augmentation results to S/L agencies for review and comment.

An Access database (named *Reference Tables for PM Augmentation*) accompanies this document. This database contains the SCC Control Device Ratio table, the Emission Factors table, and Emission Factors Crosstab table discussed in Step 2. The Emission Factors Crosstab table contains the ratios developed from the Emission Factors table. The Emission Factors table contains detailed information on the emission factors used to develop the ratios. The PM Calculator ratio table can be provided upon request – it contains all possible combinations for SCC and Control Device types that are available in the PM Calculator. Ratios from the PM calculator were developed using a standard input of 100 TONS of uncontrolled PM-FIL emissions.

1. Initial QA and Remediation of PM Pollutants

S/L agencies were initially presented with files that detailed potential inconsistencies and missing information in their PM pollutant inventory. Inconsistencies in PM pollutants include the following:

- PM-PRI less than PM10-PRI, PM25-PRI, PM10-FIL, PM25-FIL, or PM-CON;
- PM-FIL less than PM10-FIL, PM25-FIL;
- PM10-PRI less than PM25-PRI, PM10-FIL, PM25-FIL or PM-CON;
- PM10-FIL less than PM25-FIL;
- PM25-PRI less than PM25-FIL or PM-CON;
- The sum of PM10-FIL and PM-CON not equal to PM10-PRI; and
- The sum of PM25-FIL and PM-CON not equal to PM25-PRI.

Potential missing information was summarized in a table which detailed the variety of cases provided by each S/L agency. For example, an S/L agency might have provided PM10-FIL and PM25-FIL for some processes, but provided only PM10-FIL for other processes.

S/L agencies were asked to review this information and provide corrections where possible. In general, corrections (or general directions) were provided in the case of the potential inconsistency issues. An example of a general direction provided by a S/L agency was to remove PM25-FIL where greater than PM10-FIL because the PM10-FIL was (in their particular case) known to be more reliable. In other cases, the agency-provided specific process-level pollutant corrections. If specific direction was not provided by the agency, zero PM pollutants were generally removed, or complements were set equal to the higher number.

2. Development of PM Factor Ratio

The primary deliverable of this step of the process was the development of a table keyed by SCC, primary control device, and secondary control device. This table is called the SCC Control Device Ratios table (see Table II-1). This table was filled according to the following steps:

- Ratios (both condensible and noncondensible) were added from FIRE for SCCs starting with 10* (external fuel combustion) and 20* (internal fuel combustion) where there was a direct match between the provided SCC, and primary and secondary control devices.

- Ratios (non-condensable) were added from the PM Calculator for SCCs starting with 10* and 20* where there was not a direct match between the provided SCC, and primary and secondary control devices. Condensible ratios were added from the PM Calculator based on the uncontrolled SCC for these SCCs. In some cases, it was necessary to map the SCC and control devices to the PM calculator to find a match for the noncondensible ratios. In other cases, it was necessary to map the SCC to FIRE to find a match for condensible ratios.

- For natural gas, process gas, and liquified petroleum gas (LPG) SCCs starting with 10* and 20*, it was assumed (based on FIRE emission factors) that the PM-PRI/PM10-PRI/PM25-PRI ratio was equal to 1. It was also assumed that the PM-FIL/PM10- FIL /PM25- FIL was equal to 1. Condensible ratios were calculated from uncontrolled FIRE emission factors for these SCCs. In some cases it was necessary to map the SCC to FIRE to find a match for condensible ratios.

- Ratios for SCCs not like 10* and 20* were obtained from the PM Calculator. It was assumed that the condensible component was zero.

Table II-1. Description of the Field Names and Descriptions for the SCC Control Device Ratios Table

Field Name	Field Description
PM Calculator	A "Yes" in this field indicates that at least some of the information was retrieved from the PM Calculator
FIRE	A "Yes" in this field indicates that at least some of the information was retrieved from the Emission Factors table. A "Condensible Ratios" in this field indicates that the condensible ratios factors were retrieved from this table.
Other	A field to indicate other sources as necessary.
SCC	Source category code from the S/L agency-provided data.
SCC_DESC	Description of source category code from the S/L agency-provided data.
maptoSCC	This field equals SCC unless the SCC provided was not found in the appropriate source table. In that case, the SCC was mapped using the closest available appropriate mapping choice.
maptoSCC_DESC	Description of the maptoSCC.
mapSCCNote	Any notes related to the mapping of the SCC. A "Yes" in this field indicates that the SCC was mapped.
PD	Primary device type from the S/L agency provided data.
PD_DESC	Description of the primary device (PD).
maptoPD	This field equals PD unless the PD provided was not found in the appropriate source table. In that case, the PD was mapped using the closest available appropriate mapping choice.
maptoPD_DESC	Description of the maptoPD.
mapPDNote	Any notes related to the mapping of the PD. A "Yes" in this field indicates that the PD was mapped.
SD	Secondary device type from the S/L agency provided data.
SD_DESC	Description of the secondary device (SD).
maptoSD	This field equals SD unless the SD provided was not found in the appropriate source table. In that case, the SD was mapped using the closest available appropriate mapping choice.
maptoSD_DESC	Description of the maptoSD.
mapSDNote	Any notes related to the mapping of the SD. A "Yes" in this field indicates that the SD was mapped.
PM-FIL/PM10-FIL	This field and the following are ratios calculated from emission factors found either in FIRE or the PM calculator.
PM-FIL/PM25-FIL	This field and the following are ratios calculated from emission factors found either in FIRE or the PM calculator.
PM-FIL/PM-PRI	This field and the following are ratios calculated from emission factors found either in FIRE or the PM calculator.
PM-PRI/PM10-PRI	This field and the following are ratios calculated from emission factors found either in FIRE or the PM calculator.
PM-PRI/PM25-PRI	This field and the following are ratios calculated from emission factors found either in FIRE or the PM calculator.
PM10-FIL/PM25-FIL	This field and the following are ratios calculated from emission factors found either in FIRE or the PM calculator.
PM10-PRI/PM25-PRI	This field and the following are ratios calculated from emission factors found either in FIRE or the PM calculator.
PM-CON/PM10-FIL	Condensible ratios were calculate from FIRE if available for 10* and 20* SCCs. If condensible ratios were not found in FIRE for 10* and 20* these ratios were set to zero.
PM-CON/PM10-PRI	Condensible ratios were calculate from FIRE if available for 10* and 20* SCCs. If condensible ratios were not found in FIRE for 10* and 20* these ratios were set to zero.
PM-CON/PM25-FIL	Condensible ratios were calculate from FIRE if available for 10* and 20* SCCs. If condensible ratios were not found in FIRE for 10* and 20* these ratios were set to zero.
PM-CON/PM25-PRI	Condensible ratios were calculate from FIRE if available for 10* and 20* SCCs. If condensible ratios were not found in FIRE for 10* and 20* these ratios were set to zero.
PM-CON/PM-FIL	Condensible ratios were calculate from FIRE if available for 10* and 20* SCCs. If condensible ratios were not found in FIRE for 10* and 20* these ratios were set to zero.
PM-CON/PM-PRI	Condensible ratios were calculate from FIRE if available for 10* and 20* SCCs. If condensible ratios were not found in FIRE for 10* and 20* these ratios were set to zero.
RPO Specific Note	Indicates SCC and control device combinations are in the RPO inventory.
Additional Notes	Any notes regarding assumptions about ratios.

3. *Implementation of the QA Ratios*

In order to calculate the additional PM pollutants based on the SCC Control Device ratio table developed in the above step, a crosstab table was created from the EM table based on the following fields:

- State FIPS
- County FIPS
- Tribal Code
- EU ID
- Process ID
- Start Date
- End Date
- Emission Type
- SCC
- Primary Device Type
- Secondary Device Type

The primary and secondary device type fields were added based on information from the CE table. If CE information was not available these fields were defaulted to 000 ("UNCONTROLLED"). In the few cases where there was a conflict between the control devices reported for the same process for PM pollutants (e.g., a PM10-PRI is listed as controlled, but PM-PRI did not have control information), the control device type was selected based on the controlled pollutant.

In addition to the fields listed above, the crosstab included the PM emission amounts for the particular process and a field that indicated whether those emissions existed in the inventory. These fields were as follows:

- PM_PRI
- PM_FIL
- PM10_PRI
- PM10_FIL
- PM25_PRI
- PM25_FIL
- PM_CON
- PM_PRI_EXISTS
- PM_FIL_EXISTS
- PM10_PRI_EXISTS
- PM10_FIL_EXISTS
- PM25_PRI_EXISTS
- PM25_FIL_EXISTS
- PM_CON_EXISTS

The emission values were in the PM_PRI, PM_FIL, PM10_PRI, PM10_FIL, PM25_PRI, PM25_FIL, PM_CON fields. The _EXISTS field indicated whether the pollutant was provided by the S/L agency. A zero indicated that the pollutant was not provided; a number greater than zero (usually one) indicates that it was provided by the S/L agency.

Prior to the development of this crosstab, the EM table was filled in as much as possible using basic assumptions. For example, if the S/L agency provided zero emissions for some but not all forms of PM for a particular process, it was assumed that all forms of PM for that process were zero and they were filled in accordingly. Since that assumption was that for non 10* and 20* SCCs, the condensible value was zero – that would lead to PM10-FIL = PM10-PRI and PM25-FIL = PM25-PRI and PM-FIL = PM-PRI. Given that assumption, values for these pollutants were also filled in. After this data insertion, a subset of the crosstab was created. This subset only contained processes that required additional augmentation. The SCC Control Device Type ratio table was based on only those SCC and control device types that required augmentation.

The next step was to fill in the missing information in this crosstab using the information found in the SCC Control Device Ratio table.

In calculating PM complement pollutants, priority was given to calculating –PRI and –CON pollutants. FIL pollutants were only calculated if necessary to calculate other pollutants or if it was a by-product of this calculation.

In augmenting the PM pollutants, the non 10* and 20* SCCs were augmented first, with order given to augmenting based on PM_{10} where available, $PM_{2.5}$ where available, and then PM.

Augmenting the PM pollutants for the 10* and 20* SCCs is more complicated, but the basic approach was to augment based on PM_{10} (FIL or PRI) where available, $PM_{2.5}$ (FIL or PRI) where available, and then PM (FIL or PRI) if PM_{10} or $PM_{2.5}$ variations were not available. Where both PM_{10} (FIL or PRI) and $PM_{2.5}$ (FIL or PRI) variations were both available, the calculation for PM-CON was generally driven from the PM_{10} number and the complements as necessary were back calculated. Where a PRI emission factor ratio was required and was not available, the FIL emission factor ratio was used.

After completing the calculations, the data was QA checked to ensure that the calculations resulted in consistent values for the PM complement. On a few occasions, the mix of ratio value and the pollutants and values provided by the S/L agency resulted in negative values when FIL was back-calculated. In this case the negative FIL value was set to zero and the PRI value was readjusted. In a few cases the appropriate combination of ratios, SCC, and control efficiencies were not available to calculate the PM10-PRI and PM25-PRI values. In these cases, PM10-PRI and PM25-PRI were set equal. The resultant PM table information was appended to the EM table.

Note: The augmentation procedures resulted in some high condensible ratios that were calculated for some SCC control device type combinations. In most cases, these high condensible ratios were the result of the back calculation of PM-CON from PMxx-PRI records.

Since the state had already provided the PMxx-PRI records, these PM-CON values were not added.

The data source code field was used to identify records that were added to the inventory to complete the set of PM10-PRI and PM25-PRI emissions.

iii. ERP Coordinates

If an S/L agency did not provide corrections for ERP coordinates that map more than 5 km outside of the county boundary, or provide coordinates for ERP records that did not have any coordinates in the S/L inventory, the following procedures were applied to replace the coordinates:

- Coordinates for other ERPs at the same facility, if available, that map within the county;
- Coordinates for the centroid of the zip code for a facility if a valid zip code was provided or could be obtained from the agency if it is not valid; or
- County centroid coordinates.

The zip code was taken from the SI NIF 3.0 table. The zip code was compared to a reference table of valid zip codes to verify that it was an active zip code and existed in the state and county reported in the inventory. If a valid zip code for a facility could not be identified, the centroid for the facility's county was used as a last resort. In some cases, the S/L agency provided confirmation that the S/L coordinates were correct even if the analysis indicated that the coordinates were outside of the county. These coordinates were not changed. Additionally, all coordinates were converted to latitude/longitude measurements.

iv. ERP Parameters

If valid ERP parameters were not provided by the S/L agency, the ERP augmentation procedures that EPA developed for the 2002 point source NEI were applied to the MANE-VU inventory (EPA, 2004b). It has been determined that the augmentation procedures in this document regarding SCC-specific ERP types and temperatures may be difficult to resolve. When this situation occurs, preference was given to the S/L agency -supplied ERP type and SCC. For example, the procedures do not account for cases where an EU has two processes with one defined as a stack source and the other as a fugitive source. Therefore, the S/L-supplied ERP type was used when this situation occurred. If the ERP type was null, and information was not available from the S/L agency, the stack height information was used as a guide. If stack height information was available, the ERP was treated as a stack, if stack height information was not available, the ERP was treated as a fugitive. An additional modification to the augmentation procedure was also implemented. Since in many cases null values were filled in with zeros by S/L local databases when comparing out-of-range velocities and flows (after it was determined that the stack and diameter information was correct) – null and zero values were treated in the same manner to prevent inappropriate replacement of stack parameter values. Additionally, stack parameter values were rounded to 1 decimal place when comparing with range values (just for the purposes of comparison) to prevent replacement of S/L parameter values based on negligible decimal differences.

v. Control Device Type and Control Efficiency Data

Control efficiencies that were 100% and rule effectiveness of 100% with non-zero emissions were diagnosed as potential errors and sent to the S/L agencies. Where possible these data were updated with S/L data corrections. Decimal control efficiencies were also diagnosed and sent to the S/L agencies. A decimal control efficiency was usually a sign that a control efficiency had not been entered as a percentage as is required by NIF 3.0. Where possible these data was updated with S/L data corrections.

c. QA Review of Final Inventory

Final QA checks were run on the revised point source inventory data set to ensure that all corrections provided by the S/L agencies were incorporated into the S/L inventories and that there were no remaining QA issues that could be addressed during the duration of the project. The EPA QA program was run on the inventory and the QA output was reviewed to verify that all QA issues that could be addressed were resolved. The QA output file was provided in an Access database along with Version 3 of the inventory.

3. Version 3 Emissions Summary

Table II-2 presents a State-level summary of the annual point source emissions in Version 3 of the 2002 MANE-VU inventory. Note that PM10-PRI and PM25-PRI emissions are included in the inventory for all SCCs for which S/L agencies reported any form of PM, PM_{10}, and/or $PM_{2.5}$ emissions. If an agency did not report PM10-PRI and/or PM25-PRI but reported PM-PRI, PM-FIL, PM-CON, PM10-FIL, and/or PM25-FIL, the PM augmentation procedures discussed in the TSD were applied to the form of PM emissions supplied by the agency to calculate emissions for the other forms of PM emissions. If an agency reported PM10-PRI and/or PM25-PRI emissions but not PM10-FIL, PM25-FIL, or PM-CON emissions, the agency's inventory was not augmented to calculate filterable or condensible emissions. Note that PM-CON is associated with only fuel combustion sources.

Table II-2. Version 3 2002 MANE-VU Point Source Emissions by State (Tons/Year)

State	CO	NH_3	NO_x	PM10-FIL	PM10-PRI	PM25-FIL	PM25-PRI	PM-CON	SO_2	VOC
Connecticut	4,053		12,923	738	1,617	0	1,283	389	15,988	4,907
Delaware	9,766	196	16,345	2,466	4,217	1,919	3,666	1,750	73,744	4,755
District of Columbia	248	4	780	91	161	54	132	68	963	69
Maine	17,005	845	19,939	4,535	7,289	2,567	5,787	2,753	23,711	5,319
Maryland	99,024	305	95,328	3,723	9,029	0	5,054	2,018	290,927	6,184
Massachusetts	21,262	1,463	47,086	2,776	5,852	997	4,161	2,984	101,049	8,263
New Hampshire	2,725	74	9,759	1,180	3,332	786	2,938	2,151	46,560	1,599
New Jersey	12,300		51,593	2,928	6,072	2,543	4,779	3	61,217	14,401
New York	66,427	1,861	118,978	1,808	10,392	1,965	7,080	210	294,729	11,456
Pennsylvania	121,524	1,388	297,379	18,044	40,587	6,038	20,116	5,065	995,175	37,323
Rhode Island	2,234	58	2,764	233	300	117	183	68	2,666	1,928
Vermont	1,078		787	130	304	97	267	2	905	1,097
MANE-VU	**357,645**	**6,194**	**673,660**	**38,654**	**89,150**	**17,083**	**55,447**	**17,462**	**1,907,634**	**97,300**

B. State-Specific Methods

For each of the MANE-VU states and two local agencies in Pennsylvania, this section identifies the temporal basis of the emissions included in Version 3 and discusses revisions incorporated into Version 3. In addition, this section also discusses the origin of each S/L agency's emissions included in Version 3. For each agency, a table is provided in Appendix A that lists the data source codes by SCC, emission type period, and pollutant. In addition, an electronic folder is provided for each S/L agency containing the QA Summary Reports prepared during Version 1 and other files documenting revisions included in Versions 2 and 3.

1. Connecticut

Connecticut's Version 3 point source inventory originates from Version 1 except for the following revisions that Connecticut provided for Version 2 and included in Version 3:

- Changed coordinates for AES Thames, Inc. in New London County to -72.3184, 41.4499 (FIPS code 09011, facility identifier 1544).

- Changed values for Hartford Steam (FIPS code 09003, facility identifier 3471), EU P0250, process 02 for summer daily values as follows: Changed actual throughput from 1934 E6FT3 to 1.934 E6FT3, CO summer daily emissions from 53.185 tons to 0.0532 tons, NO_x summer daily emissions from 255.288 tons to 0.1021 tons, and VOC summer daily emissions from 1.2569 tons to 0.0027 tons.

Table II-3 shows the emission type periods for which Connecticut provided emissions.

Table II-3. Connecticut 2002 Point, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
NONANNUAL	20011201	20020228	27
NONANNUAL	20011201	20020228	29
NONANNUAL	20020601	20020831	27
NONANNUAL	20020601	20020831	29

Table A-1 in Appendix A identifies the data sources by SCC, emission type period, and pollutant in the Version 3 point source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. Connecticut provided the data for CO, NO_x, PM10-PRI, SO_2, and VOC. Connecticut did not provide any data for NH_3. Emissions for PM10-FIL, PM25-PRI, PM25-FIL, and PM-CON were calculated from the PM10-PRI emissions provided by Connecticut using the PM augmentation procedures.

2. Delaware

Delaware's Version 3 point source inventory originates from Version 1 except for some updates to ORIS Boiler IDs in the EU table that were incorporated into Version 2 and included in Version 3. Table II-4 shows the emission type periods for which Delaware provided emissions.

Table II-4. Delaware 2002 Point, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
NONANNUAL	20020601	20020831	29

Table A-2 in Appendix A identifies the data sources by SCC, emission type period, and pollutant in the Version 3 point source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. Delaware provided the data for CO, NH_3, NO_x, SO_2, and VOC. Delaware also provided much of the PM emissions data but in some cases the PM augmentation procedures were applied to the PM data provided by Delaware to calculate emissions for other forms of PM (e.g., to estimate PM10-PRI from PM10-FIL, PM25-PRI from PM25-FIL, PM10-PRI and PM10-FIL from PM25-PRI and PM25-FIL).

3. District of Columbia

The District of Columbia's Version 3 point source inventory originates from Version 1. Table II-5 shows the emission type period for which the District of Columbia provided emissions.

Table II-5. District of Columbia 2002 Point, Version 3: Unique List of Start Date, End Date, and Emission Type

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30

Table A-3 in Appendix A identifies the data sources by SCC, emission type period, and pollutant in the Version 3 point source inventory. This table also shows the number of counties by SCC. The District of Columbia provided the data for CO, NH_3, NO_x, SO_2, and VOC. The District of Columbia provided at least one form of PM emissions and the PM augmentation procedures were applied to the emissions provided by the District of Columbia to calculate emissions for the other forms of PM.

4. Maine

Maine's Version 3 point source inventory originates from Version 1. Table II-6 shows the emission type periods for which Maine provided emissions.

Table II-6. Maine 2002 Point, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
NONANNUAL	20020601	20020831	29

Table A-4 in Appendix A identifies the data sources by SCC, emission type period, and pollutant in the Version 3 point source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. Maine provided the emissions data for CO, NH_3, NO_x, SO_2, and VOC. Maine provided PM10-FIL and/or PM25-FIL emissions data and the PM augmentation procedures were applied to the emissions that Maine provided to calculate emissions for the other forms of PM.

5. Maryland

Maryland's Version 3 point source inventory originates from Version 1 except for some updates to ORIS Boiler IDs in the EU table that were incorporated into Version 2 and included in Version 3. Table II-7 shows the emission type periods for which Maryland provided emissions.

Table II-7. Maryland 2002 Point, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
ANNUAL	20040101	20041231	30
NONANNUAL	20020101	20021231	29
NONANNUAL	20020501	20020930	29
NONANNUAL	20040101	20041231	29

Table A-5 in Appendix A identifies the data sources by SCC, emission type period, and pollutant in the Version 3 point source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. Maryland provided the emissions data for CO, NH_3, NO_x, SO_2, VOC, PM10-PRI, and PM-PRI. The PM augmentation procedures were applied to the PM10-PRI emissions that Maryland provided to calculate emissions for the other forms of PM. Maryland provided NH_3 emissions for its point sources except for one new facility (state and county FIPS code 24013, facility ID 0012, SCC 30500622, data source code P) for which it used NH_3 emissions for four EUs (preheater kiln/dry process) prepared by MANE-VU.

6. Massachusetts

Massachusetts' Version 3 point source inventory originates from Version 1 except for the some stack parameter revisions that Massachusetts provided and were incorporated into Version 3. For Version 3, Massachusetts provided revisions to stack parameters in the ERP table for six EUs at three facilities. The revisions are listed in the Excel file named "MA Revisions to MANEVU V3 Point EI_040706.xls". Table II-8 shows the emission type periods for which Massachusetts provided emissions.

Table II-8. Massachusetts 2002 Point, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
ANNUAL	20030101	20031231	30

Table A-6 in Appendix A identifies the data sources by SCC, emission type period, and pollutant in the Version 3 point source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. Massachusetts provided the emissions data for CO, NH_3, NO_x, SO_2, and VOC. Massachusetts provided PM-FIL, PM10-FIL, and/or PM25-FIL emissions data and the PM augmentation procedures were applied to the emissions that Massachusetts provided to calculate emissions for the other forms of PM.

7. New Hampshire

New Hampshire's Version 3 point source inventory originates from Version 1.
Table II-9 shows the emission type periods for which New Hampshire provided emissions.

Table II-9. New Hampshire 2002 Point, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
NONANNUAL	20020601	20020831	29

Table A-7 in Appendix A identifies the data sources by SCC, emission type period, and pollutant in the Version 3 point source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. New Hampshire provided the emissions data for CO, NH_3, NO_x, SO_2, and VOC. New Hampshire provided PM-FIL, PM10-FIL, and/or PM25-FIL emissions data and the PM augmentation procedures were applied to the emissions that New Hampshire provided to calculate emissions for the other forms of PM.

8. New Jersey

New Jersey's Version 3 point source inventory originates from Version 1. In addition to the QA checks discussed previously in this TSD, New Jersey's original inventory submittal to EPA contained several issues with SCCs. For Version 1, per direction provided by New Jersey, SCCs that were less than 8 digits were changed to SCCs with 8 digits. Also, as approved by New Jersey, inactive SCC 39999901 was changed to active SCC 39999999. The invalid unit "GAL" was changed to the valid unit "E6GAL" in the EP table.

Table II-10 shows the emission type periods for which New Jersey provided emissions.

Table II-10. New Jersey 2002 Point, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
NONANNUAL	20011201	20020228	29
NONANNUAL	20020601	20020831	29

Table A-8 in Appendix A identifies the data sources by SCC, emission type period, and pollutant in the Version 3 point source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. New Jersey provided the emissions data for CO, NO_x, SO_2, and VOC. New Jersey provided PM-PRI, PM10-PRI, and/or PM25-PRI emissions data and the PM augmentation procedures were applied to the emissions that New Jersey provided to calculate emissions for the other forms of PM. New Jersey did not provide any data for NH_3.

9. New York

New York's Version 3 point source inventory originates from Version 1 except for the following revisions that New York provided and were incorporated into Version 3.

For Version 3, New York provided an Access database named "MANEVU_NY2002_ Point_Corrected_093005.mdb" with revisions to records in the EM table. New York also provided in this database 651 records that were not included in Version 2 of MANE-VU's point source inventory, and, therefore, these records were added to Version 3 of MANE-VU's point source inventory. The new records added emissions for pollutants (not in Version 2) for EUs and processes that existed in Version 2 of MANE-VU's point source inventory.

The records in Version 2 that were revised and the records that were added to Version 3 are listed in the Excel file named "NY Revisions to MANE-VU V3 Point EI_040706.xls". Table II-11 shows the emission type period for which New York provided emissions.

Table II-11. New York 2002 Point, Version 3: Unique List of Start Date, End Date, and Emission Type

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30

Table A-9 in Appendix A identifies the data sources by SCC, emission type period, and pollutant in the Version 3 point source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. New York provided the emissions data for CO, NH_3, NO_x, SO_2, and VOC. New York provided PM-PRI, PM10-PRI, and/or PM25-PRI emissions data and the PM augmentation procedures were applied to the emissions that New York provided to calculate emissions for the other forms of PM. New York provided NH_3 emissions for its point sources except for four cement kilns for which it used NH_3 emissions from a MANE-VU-sponsored inventory. The following identifies the facilities for which the MAEN-VU-sponsored NH_3 emissions inventory for cement kilns was used.

FIPS Code	Facility ID	SCC	Data Source
36001	4010300016	30500606 (2 kilns/dry process)	P
36001	4012400001	30500706 (1 kiln/wet process)	P
36111	3514800084	30500606 (1 kiln/dry process)	P

10. Pennsylvania (State, Excluding Allegheny and Philadelphia Counties)

The Version 3 point source inventory for the state of Pennsylvania originates from Version 1. The following summary excludes Allegheny and Philadelphia Counties who provided their own point source inventories for Versions 1, 2, and 3.

Table II-12 shows the emission type periods for which Pennsylvania provided emissions. Table A-10 in Appendix A identifies the data sources by SCC, emission type period, and pollutant in the Version 3 point source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. Pennsylvania provided the emissions data for CO, NH_3, NO_x, SO_2, and VOC. Pennsylvania provided PM10-PRI and/or PM25-PRI emissions data and the PM augmentation procedures were applied to the emissions that Pennsylvania provided to calculate emissions for the other forms of PM.

Table II-12. Pennsylvania 2002 Point, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type	Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20020104	30	ANNUAL	20020131	20020812	30
ANNUAL	20020101	20020111	30	ANNUAL	20020131	20021231	30
ANNUAL	20020101	20020120	30	ANNUAL	20020201	20020228	30
ANNUAL	20020101	20020123	30	ANNUAL	20020201	20020424	30
ANNUAL	20020101	20020130	30	ANNUAL	20020201	20020831	30
ANNUAL	20020101	20020131	30	ANNUAL	20020201	20020930	30
ANNUAL	20020101	20020212	30	ANNUAL	20020201	20021030	30
ANNUAL	20020101	20020215	30	ANNUAL	20020201	20021130	30
ANNUAL	20020101	20020221	30	ANNUAL	20020201	20021231	30
ANNUAL	20020101	20020228	30	ANNUAL	20020205	20021223	30
ANNUAL	20020101	20020313	30	ANNUAL	20020213	20020913	30
ANNUAL	20020101	20020329	30	ANNUAL	20020214	20021231	30
ANNUAL	20020101	20020331	30	ANNUAL	20020216	20020331	30
ANNUAL	20020101	20020412	30	ANNUAL	20020301	20020331	30
ANNUAL	20020101	20020414	30	ANNUAL	20020301	20020430	30
ANNUAL	20020101	20020422	30	ANNUAL	20020301	20020531	30
ANNUAL	20020101	20020427	30	ANNUAL	20020301	20021031	30
ANNUAL	20020101	20020430	30	ANNUAL	20020301	20021130	30
ANNUAL	20020101	20020503	30	ANNUAL	20020301	20021231	30
ANNUAL	20020101	20020514	30	ANNUAL	20020311	20021213	30
ANNUAL	20020101	20020517	30	ANNUAL	20020311	20021231	30
ANNUAL	20020101	20020521	30	ANNUAL	20020314	20021209	30
ANNUAL	20020101	20020531	30	ANNUAL	20020318	20021223	30
ANNUAL	20020101	20020603	30	ANNUAL	20020320	20020915	30
ANNUAL	20020101	20020614	30	ANNUAL	20020320	20021231	30
ANNUAL	20020101	20020626	30	ANNUAL	20020328	20021120	30
ANNUAL	20020101	20020628	30	ANNUAL	20020330	20021122	30
ANNUAL	20020101	20020630	30	ANNUAL	20020401	20020430	30
ANNUAL	20020101	20020701	30	ANNUAL	20020401	20020531	30
ANNUAL	20020101	20020731	30	ANNUAL	20020401	20020731	30
ANNUAL	20020101	20020813	30	ANNUAL	20020401	20020930	30
ANNUAL	20020101	20020831	30	ANNUAL	20020401	20021231	30
ANNUAL	20020101	20020909	30	ANNUAL	20020409	20021205	30
ANNUAL	20020101	20020930	30	ANNUAL	20020415	20021117	30
ANNUAL	20020101	20021031	30	ANNUAL	20020415	20021231	30
ANNUAL	20020101	20021101	30	ANNUAL	20020421	20021024	30
ANNUAL	20020101	20021112	30	ANNUAL	20020424	20021016	30
ANNUAL	20020101	20021130	30	ANNUAL	20020428	20021231	30
ANNUAL	20020101	20021213	30	ANNUAL	20020429	20020922	30
ANNUAL	20020101	20021216	30	ANNUAL	20020429	20021031	30
ANNUAL	20020101	20021217	30	ANNUAL	20020501	20020630	30
ANNUAL	20020101	20021220	30	ANNUAL	20020501	20020930	30
ANNUAL	20020101	20021223	30	ANNUAL	20020501	20021013	30
ANNUAL	20020101	20021230	30	ANNUAL	20020501	20021031	30
ANNUAL	20020101	20021231	30	ANNUAL	20020501	20021231	30
ANNUAL	20020102	20020703	30	ANNUAL	20020506	20021202	30
ANNUAL	20020102	20021203	30	ANNUAL	20020511	20021231	30
ANNUAL	20020102	20021215	30	ANNUAL	20020515	20021231	30
ANNUAL	20020102	20021223	30	ANNUAL	20020519	20020727	30
ANNUAL	20020102	20021227	30	ANNUAL	20020525	20021231	30

Table II-12. (Continued)

Emission Type Period	Start Date	End Date	Emission Type	Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020102	20021228	30	ANNUAL	20020601	20020602	30
ANNUAL	20020102	20021229	30	ANNUAL	20020601	20020831	30
ANNUAL	20020102	20021230	30	ANNUAL	20020601	20020930	30
ANNUAL	20020102	20021231	30	ANNUAL	20020601	20021019	30
ANNUAL	20020103	20021126	30	ANNUAL	20020603	20021231	30
ANNUAL	20020103	20021228	30	ANNUAL	20020606	20021127	30
ANNUAL	20020103	20021231	30	ANNUAL	20020629	20021231	30
ANNUAL	20020104	20020930	30	ANNUAL	20020701	20020731	30
ANNUAL	20020104	20021223	30	ANNUAL	20020701	20020930	30
ANNUAL	20020104	20021231	30	ANNUAL	20020701	20021231	30
ANNUAL	20020105	20021218	30	ANNUAL	20020708	20021231	30
ANNUAL	20020105	20021231	30	ANNUAL	20020801	20020831	30
ANNUAL	20020106	20021231	30	ANNUAL	20020801	20020930	30
ANNUAL	20020107	20021231	30	ANNUAL	20020801	20021130	30
ANNUAL	20020108	20021221	30	ANNUAL	20020801	20021231	30
ANNUAL	20020108	20021228	30	ANNUAL	20020802	20021231	30
ANNUAL	20020110	20021204	30	ANNUAL	20020901	20020930	30
ANNUAL	20020111	20021231	30	ANNUAL	20020901	20021231	30
ANNUAL	20020113	20021006	30	ANNUAL	20020920	20021231	30
ANNUAL	20020114	20021203	30	ANNUAL	20021001	20021030	30
ANNUAL	20020115	20020318	30	ANNUAL	20021001	20021231	30
ANNUAL	20020115	20020323	30	ANNUAL	20021028	20021231	30
ANNUAL	20020115	20020326	30	ANNUAL	20021101	20021231	30
ANNUAL	20020115	20020830	30	ANNUAL	20021118	20021231	30
ANNUAL	20020123	20020127	30	ANNUAL	20021201	20021231	30
ANNUAL	20020124	20021127	30				

11. Pennsylvania (Allegheny County, FIPS code 42003)

The Version 3 point source inventory for Allegheny County, Pennsylvania originates from Version 1. Table II-13 shows the emission type periods for which Allegheny County provided emissions.

Table II-13. Pennsylvania - Allegheny County 2002 Point, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
NONANNUAL	20011201	20020228	29
NONANNUAL	20020601	20020831	29

Table A-11 in Appendix A identifies the data sources by SCC, emission type period, and pollutant in the Version 3 point source inventory. This table also shows the number of counties by SCC. Allegheny County provided the emissions data for CO, NH_3, NO_x, SO_2, and VOC. Allegheny County provided PM-FIL, PM10-FIL, PM25-FIL, and/or PM-CON emissions data and the PM augmentation procedures were applied to the emissions that Allegheny County provided to calculate emissions for the other forms of PM.

12. Pennsylvania (Philadelphia County, FIPS code 42101)

The Version 3 point source inventory for Philadelphia County, Pennsylvania originates from Version 1. Table II-14 shows the emission type periods for which Philadelphia County provided emissions.

Table II-14. Pennsylvania - Philadelphia County 2002 Point, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
NONANNUAL	20011201	20020228	29
NONANNUAL	20020601	20020831	29

Table A-12 in Appendix A identifies the data sources by SCC, emission type period, and pollutant in the Version 3 point source inventory. This table also shows the number of counties by SCC. Philadelphia County provided the emissions data for CO, NH_3, NO_x, SO_2, and VOC. Philadelphia County provided PM-FIL, PM10-FIL, and/or PM25-FIL emissions data and the PM augmentation procedures were applied to the emissions that Philadelphia County provided to calculate emissions for the other forms of PM.

13. Rhode Island

Rhode Island requested that their Version 2 inventory be replaced with the CAP and NH_3 inventory in the final 2002 point source NEI that EPA released during March 2006. Therefore, all of Rhode Island's point source data in Version 2 was replaced with the point source data provided in the final 2002 point source NEI. The following provides a summary of the QA issues identified and addressed in Version 1. The Excel file named "RI Revisions to MANE-VU V3 Point EI_040706.xls" provides documentation and correction of each of these issues for Version 3.

The Site table in the NEI did not include the ORIS IDs for all of the EGUs identified in the EGU crosswalk table. Therefore, the crosswalk table was used to add the ORIS IDs to the Site table. Matching of boiler IDs to the EU table for one facility was maintained in the NEI, and, therefore, included in Version 3 of MANE-VU's inventory. However, matching of boiler IDs for other facilities was not available in the crosswalk table.

The data source codes that EPA used in the Rhode Island's point source inventory for the NEI were maintained in the MANE-VU inventory. The following defines the codes:

Code	Description
A	Augmented PM data.
CAMD	Record only in 2002 Emission Tracking System (ETS)/CEM for SO_2, NO_x, and heat input values; other emissions estimated.
SCAMD1	Data were received from the state. The state's NO_x and SO_2 emission values were replaced with the ETS values.
99_PMPRI	Not defined – presumed to mean PM-PRI data originating from the 1999 NEI.
SUM	Primary PM emissions calculated as the sum of the filterable PM and PM-CON emissions
DIFF	PM-CON emissions calculated as the difference between the primary PM and filterable PM emissions

QA of PM emissions was also performed in accordance with the QAPP for the 2002 base year inventory for EM table records that were revised or added for Rhode Island and New York. As a result, it was identified that the emission ton value was not correctly calculated from the emission unit numerator and emission numeric value fields in the NEI file, therefore, the emission ton value was corrected for the MANE-VU inventory. In addition, the final NEI for Rhode Island contained NH_3 emissions for several facilities but no SCCs were provided for the NH_3 emissions; therefore, the NH_3 emissions were removed for the MANE-VU inventory as requested by Rhode Island.

For Version 3 of MANE-VU's inventory, Facility ID EGU1036 and Facility Name MANCHESTER STREET in the final 2002 NEI was changed to Facility ID AIR936 and Facility Name USGEN NEW ENGLAND INC per Rhode Island's request because this is the same facility (with ORIS ID 3236). Also, for State Facility ID AIR594, EU ID 2, ERP 2, and Process ID 2, the SCC was changed from 39000589 to 39000599. In addition, the ORIS IDs reported in the NEI were revised to make them consistent with the crosswalk prepared for MANE-VU that matches state facility IDs to ORIS IDs.

One issue was identified with one record for Rhode Island where the sum of the PM10-FIL and PM-CON emissions was more than the PM10-PRI emissions, and the sum of the PM25-FIL and PM-CON emissions was more than the PM25-PRI emissions for facility ID AIR1248 in County FIPS 44007; SCC 10300601 (External Combustion Boilers : Commercial/Institutional : Natural Gas : > 100 Million Btu/hr). In addition, the PM10-FIL emissions reported was 1.6 tons more than the PM10-PRI emissions reported, and the PM25-FIL emissions reported was 1.6 tons more than the PM25-PRI emissions reported for this facility. The record has very low emissions and it was not clear how the PM consistency issues should be addressed; therefore, due to time and resource constraints, this issue was not corrected in Version 3.

Table II-15 shows the emission type periods for which Rhode Island provided emissions.

Table II-15. Rhode Island 2002 Point, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020601	20020831	29
NONANNUAL	20020601	20020831	29
NONANNUAL	20020601	20020831	30

Table A-13 in Appendix A identifies the data sources by SCC, emission type period, and pollutant in the Version 3 point source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. Rhode Island provided the emissions data for CO, NO_x, SO_2, VOC, and PM-PRI. The EPA applied PM augmentation procedures to the PM-PRI emissions that Rhode Island provided to calculate emissions for the other forms of PM. The EPA added NH_3 emissions for an EGU from EPA's CAMD data; otherwise, NH_3 emissions are not available for other point sources in Rhode Island.

14. Vermont

Vermont's Version 3 point source inventory originates from Version 1. Table II-16 shows the emission type periods for which Vermont provided emissions.

Table II-16. Vermont 2002 Point, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
NONANNUAL	20020101	20020331	27
NONANNUAL	20020101	20021231	29
NONANNUAL	20020601	20020831	27

Table A-14 in Appendix A identifies the data sources by SCC, emission type period, and pollutant in the Version 3 point source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. Vermont provided the emissions data for CO, NO_x, SO_2, and VOC. Vermont provided PM-FIL, PM10-FIL, and/or PM25-FIL emissions data and the PM augmentation procedures were applied to the emissions that Vermont provided to calculate emissions for the other forms of PM. Vermont's inventory does not include NH_3 emissions.

C. What Issues Need to be Addressed in Future Versions?

This section provides a summary of potential revisions to incorporate into future versions of the MANE-VU point source inventory.

All States – A coordinated effort between the S/L agencies should be developed to apply consistent methods to avoid having to apply procedures to augment inventory data to correct for the QA issues and fill in missing data as discussed previously in this chapter. For example, this will ensure that consistent methods are applied across S/L agencies to ensure accurate reporting of stack parameters, PM emissions, and minimize other QA issues that were identified during the development of Versions 1, 2, and 3 of the inventory.

For PM emissions, the S/L agencies should develop and apply a consistent method for including condensible emissions for fuel combustion sources that can be applied when the agencies develop their inventories. This may include compiling the emission factors for all forms of PM into one database, organized by SCC and control type (for filterable emissions), and sharing the database among the MANE-VU S/L agencies. Use of a consistent set of emission factors will help to avoid the PM consistency issues identified in Versions 1, 2, and 3 of the MANE-VU inventory as well as ensure that condensible emissions are included in the primary emissions reported in the inventory.

The EGU crosswalk should be maintained to ensure that State Facility IDs and EU IDs are correctly matched with ORIS IDs and boiler IDs.

State-specific suggestions are as follows:

Connecticut, New Jersey, Rhode Island, and Vermont – Include NH_3 emissions.

New Jersey – Develop a method to translate the SCCs that are less than 8 digits reported by facilities to 8 digit SCCs for reporting in the inventory.

CHAPTER III – AREA SOURCES

A. General Methods for all States

1. What Data Sources Were Used?

Version 1 of the 2002 MANE-VU area source inventory was built on the inventories that the State agencies submitted to EPA from May through July of 2004 as a requirement of the CERR. Except for Rhode Island, all of the MANE-VU States also submitted area source inventories to EPA. Rhode Island elected to use the preliminary 2002 NEI for its area source inventory. The EPA performed some limited QA review of the State inventories to identify format, referential integrity, and duplicate record issues. The EPA revised the inventories to address these issues and made the files available to the State agencies on August 6, 2004. These inventory files were used as the starting point for the MANE-VU inventory. These inventory files were obtained from EPA, consolidated into a single data set, subjected to extensive QA review, and revised (as approved by the MANE-VU State agencies) to address QA issues and fill data gaps identified while preparing Version 1. Subsequently, the following agencies provided revisions to their area source inventories:

- Version 2 – District of Columbia, Massachusetts, Maryland, New Hampshire, New Jersey, New York, and Vermont.

- Version 3 – Massachusetts, Maine, New Jersey, New York, and Rhode Island.

The Version 2 and 3 revisions for these States are discussed in section III.B (State-Specific Methods) of this chapter. In addition, as requested by MANE-VU, revisions were made to Version 3 to (1) add emissions for portable fuel containers (PFCs), industrial adhesives, and outdoor residential wood combustion for some States; (2) decrease the $PM_{2.5}$ emissions for paved and unpaved roads and construction for all States; and (3) remove invalid CE records that originated from the preliminary 2002 NEI for some States. These revisions are explained in section III.A.3 of this chapter.

To track the origin of data, the temporal period of emissions, and to facilitate generation of emission summaries, the following NIF plus fields were added to the EP, PE, EM, and CE tables:

- Data Source Codes:

For the area source inventory data, the data source codes are based on the following 9-character format:

[Data Origin]-[Year]-[Grown/Not Grown/Carried Forward]-[PM Augmentation Code]

Code	Field Length
Data Origin	1
Year	3 (including leading hyphen)
Grown/Not Grown/Carried Forward	2 (including leading hyphen)
PM Augmentation	3 (including leading hyphen)

Data Origin Codes

Code	Description
S	State agency-supplied data
L	Local agency-supplied data
R	Tribal agency-supplied data
P	Regional Planning Organization
E	EPA/Emission Factors and Inventory Group (EFIG)-generated data

Year Codes

Year for which data are supplied (e.g., Year = -02 for 2002), or from which prior year data are taken (e.g., Year = -99 for 1999; -01=2001).

Grown/Carried Forward/Not Grown Codes

Code	Description
-G	Used when emissions in a pre-2002 inventory are grown to represent 2002 emissions.
-F	Used when emissions in a pre-2002 inventory are carried forward and included in the 2002 inventory without adjustment for growth.
-X	Used when the emissions are not grown or are not carried forward. For example, X is used when emissions are calculated for the 2002 inventory using 2002 activity, or when data are replaced with 2002 State data.

PM Augmentation Codes

-PA PM Augmented Emissions: Record for $PM_{10}/PM_{2.5}$ emissions that were updated or added using ad-hoc updates.

-PC PM Augmented Emissions: Record added for $PM_{10}/PM_{2.5}$ emissions estimated using the PM Calculator.

-PR PM Augmented Emissions: Record added for $PM_{10}/PM_{2.5}$ emissions estimated using ratios of PM_{10}-to-PM or $PM_{2.5}$-to-PM_{10}. If PM_{10} and $PM_{2.5}$ emissions are equal and one of the pollutants is assigned this code, the ratio is assumed to be 1.

- Revision Date: This field indicates the month and year during which the last revision was made to a record.

- State FIPS: This field indicates the State FIPS code of the submittal.

- County FIPS: This field indicates the county FIPS code of the inventory.

The following NIF plus fields were added to the EM table:

- Emission Ton Value: This field indicates the values of the emissions in tons. This field was used to prepare summaries of emissions on a consistent EU basis.

- Emission Type Period: This field indicates the period of the Emission Type – either ANNUAL, SEASONAL, MONTHLY, or DAILY. Emission table records designated as ANNUAL were used to prepare summaries of annual emissions.

- CAP_HAP: This field identifies records for CAP versus records for HAPs. For the MANE-VU inventory, the flag is CAP for all records.

- Year: This field indicates the year of the data; for this inventory, it is 2002.

2. What Quality Assurance Steps Were Performed?

A QAPP was prepared and approved by MANE-VU/MARAMA and the EPA Regional Office prior to initiating work on Version 1 of the inventory (MANE-VU, 2004a). This QAPP was followed during preparation of all three versions of the inventory. This section provides an overview of the QA checks completed on each version of the inventory. The QA process for each State inventory involved the following steps that are also included in the following discussion:

- Conduct QA checks on each State inventory;
- Prepare a QA Summary Report for submittal to the agency for review;
- Revise the inventory to resolve QA issues as directed by the agency;
- Repeat the QA checks on the revised inventory to verify that the corrections were completed;

- Perform augmentation to correct for missing data; and
- Repeat the QA checks to verify that the augmentation was completed correctly.

a. QA checks for State emission inventories

The following QA checks were run on each State inventory:

i. County and SCC coverage
ii. Pollutant coverage
iii. EPA QA summaries sent to State agencies
iv. Range errors
v. PM emissions consistency and completeness review
vi. Control device type and control efficiency data review
vii. Start and end date checks
viii. Annual and daily emissions comparison

<u>County and SCC Coverage</u>

The county coverage in the State inventories appeared to be reasonable for all States. The SCC coverage was difficult to evaluate simply by showing a count of the number of SCCs by State. Each State inventory was compared to the preliminary 2002 NEI, and area source categories in the NEI but not in a State inventory were sent to each agency for review. Each State agency then selected the NEI categories that were then added to the MANE-VU inventory.

<u>Pollutant Coverage</u>

The pollutant coverage in the State inventories was complete for all pollutants except for PM_{10} and $PM_{2.5}$. Diagnosis and resolution of PM_{10} and $PM_{2.5}$ pollutant emissions is discussed later in section III.A.2.c. The exception was Connecticut who included only VOC, NO_x, and CO emissions in its inventory submittal to EPA.

<u>EPA QA Summaries Sent to State Agencies</u>

Under a separate project with EPA, Pechan performed QA review of the State area source inventories. This QA review involved running EPA's QA program on each data set to identify and resolve QA issues. Using the results of this QA work, Pechan prepared two sets of QA summaries that EPA sent to the State agencies. Pechan contacted each State agency with QA issues identified in the EPA reports to obtain direction for correcting the QA issues identified in the reports. The following explains these two summaries:

High-level Summary of State Inventories Submitted to EPA:

The first summary was an Excel workbook file with four spreadsheets that provided the following information:

- 2002 Nonpoint File Names: This spreadsheet documented names and formats of the files that EPA received from the State agencies and the dates on which they were transferred to Pechan.

- 2002 Nonpoint Summary: This spreadsheet documented the name of the state agency, type of inventory (i.e., CAP, HAP, or both), a comparison of the number of the counties in the inventory to the total number of counties in the State to identify the geographic coverage of the inventory, a unique list of CAP codes, and the total number of area source SCCs. This spreadsheet also indicated if any nonroad or onroad emissions data were moved from the agency's area source inventory to its nonroad or onroad inventory.

- 2002 Nonpoint Emission Sums: This spreadsheet summarized emissions by start date, end date, and emission type and assigned the appropriate code to the emission type period NIF plus field.

- 2002 Nonpoint Error Summary: This spreadsheet provided a copy of the "SummaryStats" table from the EPA QA program (EPA, 2004a). This table provided the count of records for each NIF 3.0 table and identified the number of records with errors by type of error.

Detailed Summary of QA Issues:

This summary (sent to State agencies on August 11) was prepared in a text file that listed by State and NIF table the number of records with errors, and provided corrections for the errors. To support documentation of corrections to some of the errors in the text file, Pechan prepared an Excel workbook file that summarized the following errors and corrections by State: invalid pollutants codes; invalid units; invalid maximum achievable control technology (MACT) codes; and invalid and inactive SCCs. A spreadsheet was also included to show the mapping of standard industrial classification (SIC) codes to North American Industrial Classification System (NAICS) codes. This crosswalk was used to correct invalid NAICS codes if a valid SIC code was available in the State inventories and vice versa.

Additional QA for the MANE-VU Area Source Inventory

The following explains additional QA and data tracking that was performed for the MANE-VU inventory. The following data elements were reviewed to identify QA issues:

- Range Errors;
- PM Emissions Consistency and Completeness;
- Control Device Codes and Control Efficiency Values;
- Start and End Dates;
- Annual and Daily Emissions Comparison; and
- Comparison of State Inventories to the 2002 Preliminary NEI.

For each State inventory for which QA issues were identified, a separate QA Summary Report was prepared in an Excel workbook file, and sent to each State agency for review. The State agencies provided directions in the Excel Workbook file, via e-mail, or by submitting revised records in NIF 3.0 in an Access database to correct the inventories. The QA reports are discussed under section III.A.2.b.

Range Errors

The EPA's QA program contains routines that compare annual emission values, numeric fields in the PE and EP tables, and other temporal numeric fields against a range of values. The QA program flags records that are less than or greater than the range of values for review. Pechan summarized the range errors for the State agencies to review and provide corrections. According to EPA, the ranges to which values in inventories are compared represent "normal" ranges that are based on percentiles from previous inventories. The range values are conservative in that EPA wants to identify suspicious values even though the values may be real (Thompson, 2002).

PM Emissions Consistency and Completeness Review

The following consistency checks were performed at the EM table data key level (for annual emissions) to compare PM emissions:

- If an SCC was associated with a PM emission record, but was missing one or more of the following (as appropriate for the SCC [i.e., PM-CON is associated with fuel combustion only]): PM10-FIL, PM10-PRI, PM25-FIL, PM25-PRI, or PM-CON, the record was flagged for review.

- The following equations were used to determine consistency:

PM10-FIL + PM-CON = PM10-PRI
PM25-FIL + PM-CON = PM25-PRI

- The following comparisons were made to determine consistency:

  PM10-PRI >= PM10-FIL
  PM25-PRI >= PM25-FIL
  PM10-PRI >= PM-CON
  PM25-PRI >= PM-CON
  PM10-FIL >= PM25-FIL
  PM10-PRI >= PM25-PRI

If the data failed one of these checks it was diagnosed as an error. If a State agency did not provide corrections to these errors, the errors were corrected/filled in according to an augmentation procedure explained in section III.A.2.c.

For information purposes, all PM-PRI and PM-FIL records were flagged to indicate that these pollutants were included instead of, or in addition to, the standard PM10-PRI/FIL, PM25-PRI/FIL, and PM-CON pollutants.

Control Device Type and Control Efficiency Data Review

The CE codes in the "Primary Device Type Code" and "Secondary Device Type Code" fields were reviewed to identify invalid codes (i.e., codes that did not exist in the NIF 3.0 reference table) and missing codes (e.g., records with a null or uncontrolled code of 000 but with control efficiency data).

QA review of control efficiency data involved diagnosis of two types of errors. First, records were reviewed to identify control efficiency values that were reported as a decimal rather than as a percent value. Records with control efficiencies with decimal values were flagged as a potential error (although not necessarily an error, since the real control efficiency may be less than 1%). Records with a 1% control efficiency value were also identified for review by the State agency to determine if the value was reported as a decimal in its internal data system but rounded to 1% when the data were converted to NIF 3.0.

The second check identified records where 100% control was reported in the CE table, but the emissions in the EM table were greater than zero and the rule effectiveness value in the EM table was null, zero, or 100% (implying 100% control of emissions). Because many agencies did not populate the rule effectiveness field or a default value of zero was assigned, records with null or zero rule effectiveness values were included where the CE was 100% and emissions were greater than zero. For records that met these criteria, Pechan consulted with the State agency to determine if corrections were needed to any of the fields.

Start and End Date Checks

QA review was conducted to identify start and end date values in the PE and EM tables to confirm consistency with the inventory year in the TR table, and to confirm that the end date reported was greater than the start date reported.

Annual and Daily Emissions Comparison

The State inventories were reviewed to determine if any of the following conditions existed:

- Multiple records coded at the SCC level as emission type 30, but with different start and end dates. While not a true duplicate, this may indicate an error or inclusion of both annual and seasonal values.

- Multiple records coded at the SCC level as a daily emission type (27, 29, etc.) but with different start and end dates. While not a true duplicate, this may indicate an error or just inclusion of additional types of daily emissions.

- Multiple records coded at the SCC level with the same start and end date, but different emission types. While not a true duplicate, this may indicate an error or just inclusion of additional types of daily emissions.

- Any "DAILY" type record that was missing its associated "ANNUAL" record was flagged for review.

- Any "DAILY" type record that was greater than its associated "ANNUAL" record was flagged for review.

b. Responses from State Agencies

QA Summary Reports were sent to the State agencies to review the QA issues identified. The State agencies were asked to return these reports to MANE-VU with their corrections documented in the reports. These reports were then used to document revisions to the State inventories. The QA Summary Reports containing the revisions provided by the State agencies are provided in Excel Workbook files with this TSD.

c. Gap Filling and Augmentation

This section explains the methods used to add data for categories and/or pollutants missing in a State's inventory after revising the inventory to address QA issues.

i. MANE-VU sponsored inventories
ii. PM augmentation
iii. Fossil fuel combustion sources
iv. Other sources of PM emissions
v. Merging of NEI data into S/L inventories
vi. Revisions to the preliminary 2002 NEI incorporated into Version 1 of the MANE-VU inventory
vii. Additional work on Area source methods
  - Fugitive Dust Emissions from Paved and Unpaved Roads
  - Wildfires and Prescribed Burning

The following discusses the augmentation procedures that were applied to the State inventories to improve the inventories or to fill in missing data not supplied by the State agencies.

MANE-VU -Sponsored Inventories

MANE-VU sponsored inventory development for residential wood combustion, open burning, public owned treatment works (POTWs), compositing, and industrial refrigeration. At the beginning of the project for developing Version 1, each State agency was requested to indicate if it (1) included the MANE-VU-sponsored inventory for one or more of these categories in the inventory it submitted to EPA; (2) included its own estimates for a category in the inventory it submitted to EPA; or (3) if it did not include a category in its inventory, if the MANE-VU-sponsored inventory or the 2002 preliminary NEI should be used as the source of data for the category. The results of this Version 1 inventory development request are summarized in Table III-1.

Improvements to fugitive dust emissions for the paved and unpaved road categories were completed after the draft version of the consolidated area source inventory was prepared. Agencies provided guidance on if they wanted the MANE-VU-sponsored inventory for these two categories to replace the paved and unpaved road inventories they had included in their inventories. For paved roads, all States requested that the MANE-VU-sponsored inventory be used; however, New Jersey and Maryland requested that the winter-time sand/silt adjustment not be included in their inventories. For unpaved roads, nine of the 12 States requested that the MANE-VU-sponsored inventory be used. New Jersey requested that its unpaved road inventory be used instead of the MANE-VU-sponsored inventory. In addition, the District of Columbia and Delaware do not have any unpaved road activity and excluded this category from their inventories.

PM Augmentation

Procedures were developed to estimate missing pollutant data from data provided by the State agencies in order to develop a complete set of PM10-PRI and PM25-PRI emissions to support air quality modeling. The following discusses the procedures for fossil fuel combustion sources first followed by the procedures for all other area sources of PM emissions.

Fossil Fuel Combustion Sources

Fossil fuel combustion sources include industrial, commercial/institutional, and residential anthracite coal, bituminous/subbituminous coal, distillate oil and kerosene, residual oil, natural gas, and LPG. All of these sources emit both filterable and condensible emissions. The QA review of the PM emissions data for these sources focused on verifying that the emissions reported in the State inventories included both filterable and condensible emissions. The emissions for these pollutants can be reported in State inventories individually (i.e., as filterable and condensible separately) or as primary emissions (i.e., the sum of the filterable and condensible emissions). The QA review also focused on evaluating the emission factors reported in the State inventories to determine if they were reasonable.

Table III-1. Summary of MANE-VU-Sponsored Inventories Included in Version 1 of the Area Source Consolidated Emissions Inventory

Area Source Category	Pollutant	SCCs	MANE-VU Inventory Included in State's Inventory Submitted to EPA			Not Included in State's Inventory - Add to MANE-VU Inventory			State's Inventory Includes State-Developed Estimates			Not Included in State's Inventory - Add 2002 Preliminary NEI Data to State's Inventory
			Annual	Summer Day	Winter Day	Annual	Summer Day	Winter Day	Annual	Summer Day	Winter Day	Annual
POTWs	NH_3, VOC	2630020010 (Wastewater Treatment)	DE, NJ, PA	DE, NJ, PA		VT	VT		CT, DC, DE, MA, MD, NH, NJ, NY	CT, DC, DE, MA, MD, NH, NJ	NJ	ME, RI
		2630020020 (Biosolids Processes)	DE, NJ, PA	DE, NJ, PA		VT	VT		CT, DC, DE, MA, MD, NH, NJ, NY	CT, DC, DE, MA, MD, NH, NJ	NJ	ME, RI
		2630050000 (Digested Sludge)	DE, NH, NJ, PA	DE, NH, NJ, PA		VT	VT		CT, DC, DE, MA, MD, NY	CT, DC, DE, MA, MD		ME, RI
Composting	NH_3, VOC	2680001000 (Biosolids)	NH, NJ	NH, NJ		CT, DC, MA, ME, PA, VT	CT, DC, MA, ME, PA, VT					
		2680002000 (Mixed Biosolids and Green Waste)	NH, NJ	NH, NJ		CT, DC, MA, ME, PA, VT	CT, DC, MA, ME, PA, VT					
		2680003000 (Composting; Green Waste)				DC, MA, ME	DC, MA, ME					
Industrial Refrigeration	NH_3	2399010000	ME, NH, NJ	ME, NH, NJ		CT, MA, PA, VT	CT, MA, PA, VT					
Residential Wood Combustion	All criteria pollutants/ precursors, and many toxic air pollutants	2104008000 (Indoor)	MA, MD, NH	MA, MD, NH	MA, MD, NH	CT, DE, ME	CT, DE, ME	CT, DE, ME	NJ, NY, VT	NJ	NJ	DC, PA, RI
		2104008070 (Outdoor)	MA, MD, NH	MA, MD, NH	MA, MD, NH	CT, DE, ME	CT, DE, ME	CT, DE, ME				
Open Burning	All criteria pollutants/ precursors, and many toxic air pollutants	2610000100 (Leaves)	MA, MD, NH, PA			DC, DE, NY, VT			NJ	NJ	NJ	ME, RI
		2610000400 (Brush)	MA, MD, PA			CT, DC, DE, NY, VT			NJ	NJ	NJ	ME, NH, RI
		2610030000 (Municipal Solid Waste)	MA, MD, PA			DC, DE, NY			NH, NJ	NH, NJ	NJ	ME, RI, VT
		2610040400 (Municipal Yard Waste)	MA, NY, PA			DC, NY, VT			DE, NJ	DE, NJ	DE, NJ	

Table III-1 (continued)

Notes:

Gray shading identifies categories for which daily emissions are not available.

POTWs:

CT, MD: Provided VOC but not NH_3 emissions in its State inventory.

DC, MA, MD, ME, NH, RI: Reported POTW emissions under SCC 2630020000 (Total Processed).

DE: MANE-VU inventory used for NH_3; DE provided its own VOC emissions under SCC 2630020000 (Total Processed).

NJ: MANE-VU-sponsored inventory used for NH_3 only. NJ included its own inventory for the other criteria pollutants under SCCs 2630010000 and 2630020000.

NY: Reported VOC emissions under SCC 2630000000 (from the preliminary 2002 NEI) and SCC 2630020000 (State-developed inventory). MANE-VU-sponsored NH_3 inventory was not used.

Composting:

CT, NH: SCC 2680003000 is not in the MANE-VU-sponsored composting inventory for these States.

DE: This State does not have composting activity.

MD: State requested that the MANE-VU inventory for this category not be included in its inventory.

NY, RI: Did not include emissions for this category in the 2002 inventory.

Industrial Refrigeration:

DC: Requested that the preliminary 2002 NEI be used but the NEI does not contain any emissions for this category in DC.

DE: State-developed emissions are included in point source inventory.

MD, RI: Did not include emissions for this category in its inventory.

ME: Used the MANE-VU inventory emissions under SCC 2302080002 (Miscellaneous Food and Kindred Products/Refrigeration).

NH: Original inventory submittal to EPA includes SO_2 and PM emissions for SCC 2399000000 from the preliminary 2002 NEI; NH_3 emissions for SCC 2399010000 are from the MANE-VU inventory.

NY: Original inventory submittal to EPA includes SO_2 and PM emissions for SCC 2399000000 from the preliminary 2002 NEI; NY did not use the MANE-VU-sponsored NH_3 inventory for SCC 2399010000.

Residential Wood Combustion:

DC: RWC inventory in 2002 NEI covers seven SCCs and does not include daily emissions.

Open Burning:

CT: Statewide activity for SCC 2610000100 (Leaves) and SCC 2610030000 (Municipal Solid Waste) is negligible.

For SCCs 2610000400 (Brush) and 2610040400 (Municipal Yard Waste), State initially provided VOC, NO_x, and CO emissions under SCC 2610000000 which is no longer a valid SCC in EPA's master SCC list. CT recalculated emissions to include VOC, NO_x, CO, PM10-PRI/-FIL, and PM25-PRI/-FIL, and placed the emissions on valid SCC 2610000500 (Land Clearing Debris) since the majority of the activity is associated with activities covered by this SCC.

MD: The MANE-VU inventory for SCC 2610040400 (Municipal Yard Waste) reports zero emissions indicating that the activity for the category does not occur in MD. MD did not include the SCC in its inventory for this reason.

NH: Did not include NH_3 emissions in MANE-VU inventory for SCC 2610040400 (Municipal Yard Waste).

To support the QA review effort, the uncontrolled PM emission factors shown in Table III-2 were compiled from AP-42. The emission factors reported in the State inventories were compared to the emission factors in this table. Emission factors that appeared too high or too low were flagged for review by the State agency. In addition, inventory data were flagged for review by the State agency if the emissions were reported under the primary PM pollutant codes but the emission factors matched with the emission factors for filterable PM in Table III-2. Finally, if emission factors were not reported in the State agency inventory, the emission factors were back-calculated using the throughput data (if available), emissions, rule effectiveness values, and control efficiency data (if available). The back-calculated emission factors were compared to the factors in Table III-2 to identify data with major difference between the factors. It is emphasized that the uncontrolled emission factors in Table III-2 were used as a reference for reviewing State inventory data. The emission factors in this table should not be construed to be the best available for all State agencies since the emission factors will vary depending on the composition of the boiler population in an agency's area source inventory.

Delaware, Massachusetts, Maryland, New Hampshire, New Jersey, New York, and Pennsylvania provided their own inventory for all fossil fuel combustion categories. Connecticut, the District of Columbia, Maine, Rhode Island, and Vermont used fossil fuel combustion inventory data in the preliminary 2002 NEI for some or all of the categories. The following provides details on the origin of the fossil fuel combustion inventories for these States:

Connecticut supplied VOC, NO_x, and CO emissions from its 1999 inventory for industrial and commercial/institutional fossil fuel combustion. PM10-PRI, PM25-PRI, SO_2, and NH_3 emissions were taken from preliminary NEI estimates (carried forward from Version 3 of the 1999 NEI). For the residential sector, Connecticut's inventory was taken from the preliminary 2002 NEI. Connecticut provided guidance on the counties with natural gas and LPG activity for which to use the NEI estimates.

For the District of Columbia, the preliminary NEI was used to gap fill missing PM10-PRI and PM25-PRI emissions for commercial/institutional bituminous/ subbituminous coal combustion and PM10-PRI, PM25-PRI, SO_2, and NH_3 for commercial/institutional natural gas combustion. The NEI estimates for these commercial/institutional categories were carried forward from Version 3 of the 1999 NEI. The District of Columbia used the NEI estimates for residential bituminous/subbituminous coal combustion.

Maine and Rhode Island used the preliminary 2002 NEI for all three sectors. The NEI estimates for the industrial and commercial/institutional sectors were carried forward from Version 3 of the 1999 NEI, while the residential sector estimates are based on 2000 or 2002 activity estimates prepared by EPA.

Vermont used the preliminary 2002 NEI for the industrial and commercial/ institutional sectors and residential anthracite coal (carried forward from Version 3 of the 1999 NEI), but provided its own inventory for residential distillate oil, natural gas, and LPG.

Table III-2. Area Source Industrial, Commercial/Institutional, and Residential Fossil Fuel Combustion Uncontrolled Emission Factors for PM10-PRI/FIL, PM25-PRI/FIL, and PM-CON

Pollutant1	Uncontrolled Emission Factor (EF)	EF Numerator	EF Denominator	Calculated Uncontrolled EF	Reference
Industrial Boilers: Anthracite Coal (SCC 2102001000)					
PM10-FIL	2.3 x % Ash content of coal	LB	TON	30.77	AP-42 Table 1.2-4 EF calculated from formula of 2.3 * % Ash Content (13.38%). Reference for ash content is EPA, 2002.
PM25-FIL	0.6 x % Ash content of coal	LB	TON	8.03	AP-42 Table 1.2-4 EF calculated from formula of 0.6 * % Ash Content (13.38%) (used Commercial/Institutional emission factors). Reference for ash content is EPA, 2002.
PM-CON	0.08 x % Ash content of coal	LB	TON	1.07	AP-42 Table 1.2-3 Used formula for SCC 10300101, EF calculated from formula of .08 * % Ash Content (13.38%). Reference for ash content is EPA, 2002.
PM10-PRI		LB	TON	31.84	
PM25-PRI		LB	TON	9.10	
Industrial Boilers: Bituminous/Subbituminous Coal (SCC 2102002000)					
PM10-FIL	13.2	LB	TON	13.2	AP-42 Table 1.1-9 EF (used Commercial/Institutional emission factors)
PM25-FIL	4.6	LB	TON	4.6	AP-42 Table 1.1-9 EF (used Commercial/Institutional emission factors)
PM-CON	1.04	LB	TON	1.04	AP-42 Table 1.1-5 (used Commercial/Institutional emission factors)
PM10-PRI		LB	TON	14.24	
PM25-PRI		LB	TON	5.64	
Industrial Boilers and IC Engines: Distillate Oil (SCC 2102004000)					
PM10-FIL	1	LB	E3GAL	1	AP-42 Table 1.3-6
PM25-FIL	0.25	LB	E3GAL	0.25	AP-42 Table 1.3-6
PM-CON	1.3	LB	E3GAL	1.3	AP-42 Table 1.3-2
PM10-PRI		LB	E3GAL	2.30	
PM25-PRI		LB	E3GAL	1.55	
Industrial Boilers: Residual Oil (SCC 2102005000)					
PM10-FIL	7.17 x % Sulfur content of oil	LB	E3GAL	10.683	AP-42 Table 1.3-5. EF calculated from formula of 7.17(A); where A=1.12(S)+0.37; Assumed S=1% for purpose of calculating EF ratios.
PM25-FIL	4.67 x % Sulfur content of oil	LB	E3GAL	6.958	AP-42 Table 1.3-5. EF calculated from formula of 7.17(A); where A=1.12(S)+0.37; Assumed S=1% for purpose of calculating EF ratios.
PM-CON	1.5	LB	E3GAL	1.5	AP-42 Table 1.3-2
PM10-PRI		LB	E3GAL	12.18	
PM25-PRI		LB	E3GAL	8.46	
Industrial Boilers and IC Engines: Natural Gas (SCC 2102006000)					
PM10-FIL	1.9	LB	E6FT3	1.9	AP-42 Table 1.4-2
PM25-FIL	1.9	LB	E6FT3	1.9	AP-42 Table 1.4-2
PM-CON	5.7	LB	E6FT3	5.7	AP-42 Table 1.4-2
PM10-PRI	7.6	LB	E6FT3	7.60	
PM25-PRI	7.6	LB	E6FT3	7.60	

Table III-2 (continued)

Pollutant1	Uncontrolled Emission Factor (EF)	EF Numerator	EF Denominator	Calculated Uncontrolled EF	Reference
Industrial Boilers - Liquified Petroleum Gas (SCC 2102007000)					
PM10-FIL	0.6	LB	E3GAL	0.6	AP-42 Table 1.5-1
PM25-FIL	0.6	LB	E3GAL	0.6	AP-42 Table 1.5-1
PM-CON	0.506	LB	E3GAL	0.506	Used natural gas PM-CON emission factor of 5.7 lb/Million Cubic Feet (for all PM controls and uncontrolled). Used factor of 0.0887 to convert emission factor from lb/Million Cubic Feet of natural gas to lb/1,000 gallons of propane. Reference: AP-42, Table 1.4-2. Conversion factor assumes 1020 Btu/scf for natural gas (AP-42, Table 1.4-2) and 90,500 Btu/gallon for propane (AP-42, Appendix A, page A-5).
PM10-PRI		LB	E3GAL	1.11	
PM25-PRI		LB	E3GAL	1.11	
Industrial Boilers: Kerosene (SCC 2102011000)					
PM10-FIL	1	LB	E3GAL	1	AP-42 Table 1.3-6
PM25-FIL	0.25	LB	E3GAL	0.25	AP-42 Table 1.3-6
PM-CON	1.3	LB	E3GAL	1.3	AP-42 Table 1.3-6
PM10-PRI		LB	E3GAL	2.30	
PM25-PRI		LB	E3GAL	1.55	
Commercial/Institutional Heating: Anthracite Coal (SCC 2103001000)					
PM10-FIL	2.3 x % Ash content of coal	LB	TON	30.77	AP-42 Table 1.2-4 EF calculated from formula of 2.3 * % Ash Content (13.38%). Reference for ash content is EPA, 2002.
PM25-FIL	0.6 x % Ash content of coal	LB	TON	8.03	AP-42 Table 1.2-4 EF calculated from formula of 0.6 * % Ash Content (13.38%). Reference for ash content is EPA, 2002.
PM-CON	0.08 x % Ash content of coal	LB	TON	1.07	AP-42 Table 1.2-3 Used formula for SCC 10300101, EF calculated from formula of 0.08 * % Ash Content (13.38%). Reference for ash content is EPA, 2002.
PM10-PRI		LB	TON	31.84	
PM25-PRI		LB	TON	9.10	
Commercial/Institutional Heating: Bituminous and Lignite (SCC 2103002000)					
PM10-FIL	13.2	LB	TON	13.2	AP-42 Table 1.1-9 EF
PM25-FIL	4.6	LB	TON	4.6	AP-42 Table 1.1-9 EF
PM-CON	1.04	LB	TON	1.04	AP-42 Table 1.1-5 (0.04 lb/MMBtu * 26MMBtu/ton=1.04)
PM10-PRI		LB	TON	14.24	
PM25-PRI		LB	TON	5.64	
Commercial/Institutional Heating: Distillate Oil (SCC 2103004000)					
PM10-FIL	1.08	LB	E3GAL	1.08	AP-42 Table 1.3-7
PM25-FIL	0.83	LB	E3GAL	0.83	AP-42 Table 1.3-7
PM-CON	1.3	LB	E3GAL	1.3	AP-42 Table 1.3-2
PM10-PRI		LB	E3GAL	2.38	
PM25-PRI		LB	E3GAL	2.13	

Table III-2 (continued)

Pollutant[1]	Uncontrolled Emission Factor (EF)	EF Numerator	EF Denominator	Calculated Uncontrolled EF	Reference
Commercial/Institutional Heating: Residual Oil (SCC 2103005000)					
PM10-FIL	5.17 x % Sulfur content of oil	LB	E3GAL	7.703	AP-42 Table 1.3-7. EF calculated from formula of 5.17(A); where A=1.12(S)+0.37; Assumed S=1% for purpose of calculating EF ratios.
PM25-FIL	1.92 x % Sulfur content of oil	LB	E3GAL	2.861	AP-42 Table 1.3-7. EF calculated from formula of 5.17(A); where A=1.12(S)+0.37; Assumed S=1% for purpose of calculating EF ratios.
PM-CON	1.5	LB	E3GAL	1.5	AP-42, Table 1.3-2
PM10-PRI		LB	E3GAL	9.20	
PM25-PRI		LB	E3GAL	4.36	
Commercial/Institutional Heating: Natural Gas (SCC 2103006000)					
PM10-FIL	1.9	LB	E6FT3	1.9	AP-42 Table 1.4-2
PM25-FIL	1.9	LB	E6FT3	1.9	AP-42 Table 1.4-2
PM-CON	5.7	LB	E6FT3	5.7	AP-42 Table 1.4-2
PM10-PRI		LB	E6FT3	7.60	
PM25-PRI		LB	E6FT3	7.60	
Commercial/Institutional Heating: Liquified Petroleum Gas (SCC 2103007000)					
PM10-FIL	0.4	LB	E3GAL	0.4	AP-42 Table 1.5-1 (Propane for Commercial Boilers)
PM25-FIL	0.4	LB	E3GAL	0.4	AP-42 Table 1.5-1 (Propane for Commercial Boilers)
PM-CON	0.506	LB	E3GAL	0.506	Used natural gas PM-CON emission factor of 5.7 lb/Million Cubic Feet (for all PM controls and uncontrolled). Used factor of 0.0887 to convert emission factor from lb/Million Cubic Feet of natural gas to lb/1,000 gallons of propane. Reference: AP-42, Table 1.4-2. Conversion factor assumes 1020 Btu/scf for natural gas (AP-42, Table 1.4-2) and 90,500 Btu/gallon for propane (AP-42, Appendix A, page A-5).
PM10-PRI		LB	E3GAL	0.91	
PM25-PRI		LB	E3GAL	0.91	
Commercial/Institutional Heating: Kerosene (SCC 2103011000)					
PM10-FIL	1.08	LB	E3GAL	1.08	AP-42 Table 1.3-7 Used EF for Distillate Oil (per EIIP)
PM25-FIL	0.83	LB	E3GAL	0.83	AP-42 Table 1.3-7 Used EF for Distillate Oil (per EIIP)
PM-CON	1.3	LB	E3GAL	1.3	AP-42 Table 1.3-2 Used EF for Distillate Oil (per EIIP)
PM10-PRI		LB	E3GAL	2.38	
PM25-PRI		LB	E3GAL	2.13	
Residential Heating: Anthracite Coal (SCC 2104001000)					
PM10-FIL	10	LB	TON	10	EPA, 2002.
PM25-FIL	0.6 x % Ash content of coal	LB	TON	8.03	EF calculated from formula of 0.6 * % Ash Content (13.38%). Reference for EF and ash content is EPA, 2002.
PM-CON	0.08 x % Ash content of coal	LB	TON	1.07	EF calculated from formula of 0.08 * % Ash Content (13.38%). Reference for EF and ash content is EPA, 2002.
PM10-PRI		LB	TON	11.07	
PM25-PRI		LB	TON	9.10	

Table III-2 (continued)

Pollutant[1]	Uncontrolled Emission Factor (EF)	EF Numerator	EF Denominator	Calculated Uncontrolled EF	Reference
Residential Heating: Bituminous and Lignite Coal (SCC 2104002000)					
PM10-FIL	6.2	LB	TON	6.2	AP-42 Table 1.1-11
PM25-FIL	3.8	LB	TON	3.8	AP-42 Table 1.1-11
PM-CON	1.04	LB	TON	1.04	AP-42 Table 1.1-5 (0.04 lb/MMBtu * 26 MMBtu/ton=1.04)
PM10-PRI		LB	TON	7.24	
PM25-PRI		LB	TON	4.84	
Residential Heating: Distillate Oil (SCC 2104004000)					
PM10-FIL	1.08	LB	E3GAL	1.08	AP-42 Table 1.3-7 (Commercial/Institutional EF)
PM25-FIL	0.83	LB	E3GAL	0.83	AP-42 Table 1.3-7 (Commercial/Institutional EF)
PM-CON	1.3	LB	E3GAL	1.3	AP-42 Table 1.3-2
PM10-PRI		LB	E3GAL	2.38	
PM25-PRI		LB	E3GAL	2.13	
Residential Heating: Natural Gas - All types (SCC 2104006000)					
PM10-FIL	1.9	LB	E6FT3	1.9	AP-42 Table 1.4.2
PM25-FIL	1.9	LB	E6FT3	1.9	AP-42 Table 1.4.2
PM-CON	5.7	LB	E6FT3	5.7	AP-42 Table 1.4.2
PM10-PRI		LB	E6FT3	7.60	
PM25-PRI		LB	E6FT3	7.60	
Residential Heating: Liquified Petroleum Gas (SCC 2104007000)					
PM10-FIL	0.4	LB	E3GAL	0.4	AP-42 Table 1.5-1 (Same factor used for Propane for Commercial Boilers; based on EIIP)
PM25-FIL	0.4	LB	E3GAL	0.4	AP-42 Table 1.5-1 (Same factor used for Propane for Commercial Boilers; based on EIIP)
PM-CON	0.506	LB	E3GAL	0.506	Used natural gas PM-CON emission factor of 5.7 lb/Million Cubic Feet (for all PM controls and uncontrolled). Used factor of 0.0887 to convert emission factor from lb/Million Cubic Feet of natural gas to lb/1,000 gallons of propane. Reference: AP-42, Table 1.4-2. Conversion factor assumes 1020 Btu/scf for natural gas (AP-42, Table 1.4-2) and 90,500 Btu/gallon for propane (AP-42, Appendix A, page A-5).
PM10-PRI		LB	E3GAL	0.91	
PM25-PRI		LB	E3GAL	0.91	
Residential Heating: Kerosene (SCC 2104011000)					
PM10-FIL	1.08	LB	E3GAL	1.08	AP-42 Table 1.3-7 Used EF for Distillate Oil (per EIIP)
PM25-FIL	0.83	LB	E3GAL	0.83	AP-42 Table 1.3-7 Used EF for Distillate Oil (per EIIP)
PM-CON	1.3	LB	E3GAL	1.3	AP-42 Table 1.3-2 Used EF for Distillate Oil (per EIIP)
PM10-PRI		LB	E3GAL	2.38	
PM25-PRI		LB	E3GAL	2.13	

1 PM10-PRI EF = sum of PM10-FIL and PM-CON emission factors; PM25-PRI EF = sum of PM25-FIL and PM-CON emission factors.

Revisions to the NEI for residential LPG and kerosene were completed after the preliminary 2002 NEI was released in February 2004. Connecticut, the District of Columbia, Maine, and Rhode Island approved replacement of the preliminary 2002 NEI estimates with the revised estimates for LPG. Connecticut was the only State that elected to use the NEI for the residential kerosene category, and Connecticut approved replacing the preliminary 2002 NEI for this category with the revised inventory prepared by EPA.

Other Sources of PM Emissions

For States that provided only PM10-FIL and PM25-FIL emissions, PM10-PRI emissions were set equal to PM10-FIL emissions and PM25-PRI emissions were set equal to PM25-FIL emissions. The PM10-PRI and PM25-PRI emissions that were added to the inventory were assigned a data source code of S-02-X-PR where S-02-X represents the code assigned to the PM10-FIL and PM25-FIL emissions provided by the State agency and the "-PR" indicates that the ratio was applied to estimate the primary emissions (in this case, the ratio of primary to filterable emissions is "1").

PM25-PRI emissions missing from State inventories were estimated by applying a ratio of PM25-PRI-to-PM10-PRI emissions to the PM10-PRI emissions provided by the State agency. Table III-3 identifies the agencies with SCCs for which ratios were applied to estimate PM25-PRI emissions. This table also shows the ratios and the reference for the ratios.

Table III-3. SCCs for which PM25-PRI Emissions were Estimated by Applying a Ratio to the PM10-PRI Emissions in the State inventory

SCC	SCC Description	Agency	Ratio of PM25-PRI to PM10-PRI	Reference
2309100010	Industrial Processes: Fabricated Metals: SIC 34: Coating, Engraving, and Allied Services: Electroplating	NY	0.947	AP-42 emission factors for hard chrome plating tank controlled with mist eliminator. AP-42 (Table 12.20-3) shows 94.7% of total PM as less than 2.35 micrometers. Applied factor to State-supplied PM10-PRI emissions to estimate PM25-PRI emissions.
2461023000	Solvent Utilization: Miscellaneous Non-industrial: Commercial: Asphalt Roofing: Total: All Solvent Types	MA	1	No data available; assumed PM25-PRI equals PM10-PRI.
2601000000	Waste Disposal, Treatment, and Recovery: On-site Incineration: All Categories: Total	MD, NH	1	No data available; assumed PM25-PRI equals PM10-PRI.
2610000100	Waste Disposal, Treatment, and Recovery: On-site Incineration: All Categories: Yard Waste - Leaf Species Unspecified	NH	1	No data available; assumed PM25-PRI equals PM10-PRI.
2810001000	Miscellaneous Area Sources: Other Combustion: Forest Wildfires: Total	MD	1	No data available; assumed PM25-PRI equals PM10-PRI.
2810015000	Miscellaneous Area Sources: Other Combustion: Prescribed Burning for Forest Management: Total	MD	1	No data available; assumed PM25-PRI equals PM10-PRI.
2810020000	Miscellaneous Area Sources: Other Combustion: Prescribed Burning of Rangeland: Total	MD	0.86	Based on ratio of PM25-PRI to PM10-PRI for same SCC used by States in 2002 NEI.
2810030000	Miscellaneous Area Sources: Other Combustion: Structure Fires: Total	MD, NH	0.91	NEI Method.
2810050000	Miscellaneous Area Sources: Other Combustion: Motor Vehicle Fires: Total	MD, NH	0.91	NEI Method.

d. 2002 NEI

Merging of NEI Data into State Inventories

The area source inventory provided by each State agency was compared to the 2002 NEI to identify categories in the NEI that were not in each State inventory. The list of categories identified was provided to each State agency and each agency then selected the NEI categories to be added to its inventory. Identification of categories included in the 2002 NEI but not in a State inventory involved a two-step process. First, Pechan identified the categories in the NEI that did not have an electronic match on the data key of the EM table between the State inventory and the NEI. Then, Pechan manually compared the NEI categories without an electronic match to the State inventory to identify and eliminate NEI categories that were in the State inventory but had a different SCC. For example, a State inventory may use a general SCC for a category while the NEI may use different SCCs to breakout emissions at a finer detail. Examples of categories where this typically occurred include the residential wood combustion, open burning of land clearing debris, solvent utilization, and petroleum marketing and transportation categories. In addition, if a State agency requested that a MANE-VU-sponsored inventory be added to its inventory, the NEI categories that overlapped with the MANE-VU -sponsored categories were removed from the list of NEI categories considered for incorporation into a State inventory.

The source categories in the 2002 NEI that were added to a State inventory can be identified where the data source code starts with "E". These categories can be identified using the data source code field in the NIF 3.0 files or in the summary of area source emissions that contains the data source code.

Revisions to the Preliminary 2002 NEI

During preparation of the MANE-VU inventory, EPA completed revisions to the emissions for six categories in the preliminary 2002 NEI released in February 2004. As agreed to with each State agency, the revised emissions were used in the MANE-VU inventory in lieu of the preliminary 2002 NEI emissions if the agency requested that the category be included.

- Non-Residential Construction (SCC 2311020000): 2002 emissions data replaced data in preliminary 2002 NEI that were carried forward from 1999 NEI.

- Highway Construction (SCC 2311030000): 2002 emissions data replaced data in preliminary 2002 NEI that were carried forward from 1999 NEI.

- Open Burning of Land Clearing Debris (SCC 2610000500): 2002 emissions data replaced data in preliminary 2002 NEI that were carried forward from 1999 NEI. The activity for this category was based on activity prepared for the non-residential and highway construction categories. For 2002, emissions were set to zero for counties with a population that was 80% urban or more based on 2000 Census data. This was not done for the 1999 NEI. For the NEI method, it was assumed that highly urban counties do not allow this activity to take place. Note that 2002 emissions data were already included in the preliminary 2002 NEI for the open burning of residential municipal solid waste, open burning of yard waste, and the residential construction categories.

- Residential LPG Combustion (SCC 2104007000): 2000 emissions data replaced data in the preliminary 2002 NEI that were carried forward from 1999 NEI.

- Residential Kerosene Combustion (SCC 2104011000): 2000 emissions data replaced data in the preliminary 2002 NEI that were carried forward from 1999 NEI.

- Residential Wood Combustion (SCCs starting with 2104008xxx; 4 SCCs for fireplaces and 3 SCCs for woodstoves): The preliminary 2002 NEI emissions were revised to:

- Correct the CO, PM10-PRI, and PM25-PRI emission factors for fireplaces without inserts (this change doubled the emission factors associated with correcting an error in converting the values from g/kg to lb/ton);

- Correct the climate zone map for allocating national activity to States;

- Replace 1997 total residential wood consumption with 2001 estimates (this change reduced wood consumption for fireplaces with inserts and woodstoves);

- Update urban/rural population data to reflect 2002 estimates based on year 2002 total county population and year 2000 county ratios of urban/rural population to total population; and

- Change the data source code from E-02-X (this was incorrect) to E-01-X to reflect 2001 activity data adjusted to 2002.

e. QA Review of Final Inventory

Final QA checks were run on the revised data set to ensure that all corrections provided by the State agencies were incorporated into the State inventories and that there were no remaining QA issues that could be addressed during the duration of the project. After exporting the inventory in Oracle to an Access database in NIF 3.0, the EPA's QA program was run on the Access database and the QA output was reviewed to verify that all QA issues that could be addressed were resolved (EPA, 2004a).

The output file from the EPA's QA program run on the area source inventory is provided in an Access 2000 database along with the Access database containing the area source inventory in NIF 3.0.

<u>Additional Work on Area Source Methods</u>

- Fugitive Dust Emissions from Paved and Unpaved Roads

Review of Methods

This work involved compiling and summarizing information on emission estimation methods and data sources from the MANE-VU State agencies, RPOs, and EPA for the following fugitive dust area source categories: windblown dust, paved and unpaved roads, agricultural tiling and harvesting, and construction activities. A short survey form was prepared and sent to the MANE-VU State agencies to collect information on whether an agency had activity for each category during 2002. For each agency for which activity occurred in its jurisdiction during 2002, information was requested on the methods and data sources it used to prepare its 2002 inventory for each category. This information was used to prioritize the categories (e.g., work on agricultural field burning was eliminated from further consideration if MANE-VU State agencies did not have activity for this category). The methods and data applied by RPOs other than MANE-VU were obtained from RPO websites and discussions with the RPOs.

The results of this review were documented in a technical memorandum (MANE-VU, 2004b). Based on the results of the review, MANE-VU decided to proceed with developing a paved and unpaved road fugitive dust inventory that incorporated improvements to activity data used in the NEI methodology.

Methods for Improving Paved and Unpaved Road Fugitive Dust Inventory

Fugitive dust emissions from paved and unpaved roads are classified under SCCs 2294000000 and 2296000000, respectively. Fugitive dust emissions from paved and unpaved road traffic were estimated for PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL. Since these categories are not sources of PM-CON, PM10-PRI emissions are equal to PM10-FIL emissions and PM25-PRI emissions are equal to PM25-FIL. The following provides a summary of the methods.

Paved Roads

Several changes were made in the paved road fugitive dust emission calculations to improve these estimates over those prepared for EPA's 2002 NEI. First, the monthly precipitation data representing the number of days in a month with at least 0.01 inches of precipitation were developed at the county level. In comparison, a single monthly precipitation value was used to model an entire State in the 2002 NEI. Thus, the resulting MANE-VU county-specific paved road fugitive dust emission estimates should be more representative of each county than the NEI data since precipitation events can vary significantly from one part of the State to another.

The second improvement made to the paved road fugitive dust emission calculations was the use of county and road-type-specific average vehicle weights. This is an improvement over the NEI where a single average vehicle weight is applied nationwide. Thus, in the MANE-VU inventory, county/road type combinations with significant heavy truck traffic have a higher average vehicle weight and a corresponding emission factor compared to county/road type combinations with primarily lighter vehicle traffic.

The final improvement made to the MANE-VU paved road emission calculations was the use of the winter silt loading adjustments. These adjustments account for the application of sand and salt on the roads during months with frozen precipitation. The 2002 NEI does not include any wintertime silt loading adjustments. The effect of the wintertime silt loading adjustments is an increase in the paved road emission factors during the months in which it is applied. The months during which this adjustment was applied varied by State in the MANE-VU inventory.

Unpaved Roads

The county-specific precipitation data used in the paved road fugitive dust calculations were also used to improve the unpaved road fugitive dust calculations. As with the paved roads, this represents an improvement over the State-specific precipitation data used in the 2002 NEI unpaved road emission inventory. The other improvement made to the unpaved roads was the use of State-supplied unpaved road mileage data by county for Maine.

- Wildfires and Prescribed Burning

Review of Methods

This work involved compiling and summarizing information on emission estimation methods and data sources from the MANE-VU State agencies, RPOs, and EPA for the following area source categories: wildfires, prescribed burning, slash burning, and agricultural field burning. The approach previously described for the fugitive dust categories was used to collect and compile data from the MANE-VU State agencies, RPOs other than MANE-VU, and EPA for the fire categories. All of the information collected from these various information sources was summarized in a technical memorandum (MANE-VU, 2004c).

Results of Methods Review

MANE-VU recognized the need to improve the methods for estimating emissions for the fire categories. The most important revision would be to inventory fire events as point sources rather than as area sources at the county-level. However, due to resource constraints, it was decided not to pursue improvements to the methods for estimating emissions from the fire categories. It should be noted that during this project, some of the MANE-VU States provided revisions to their wildfire and prescribed burning inventories to add PM25-PRI emissions and to improve the spatial allocation of activity data at the county level. These improvements were incorporated into the MANE-VU area source inventory.

3. Version 3 Revisions

The following explains revisions to Version 3 that applied to several or all of the MANE-VU States.

Gap Filling

In Version 2 of MANE-VU's inventory, emissions for PFCs, industrial adhesives, and residential outdoor wood burning existed for some States but were missing for other States. Since these are categories for which SIP rules may be developed, it was determined that emissions for these categories should be added to Version 3. The following provides a summary of the Version 3 revisions to address missing data concerns for these categories:

- PFCs: MANE-VU estimated default 2002 emissions for these States using a per capita emission factor and county population data for each State. The derivation of the emission factor, population data, and calculation of annual and daily VOC emissions for PFCs is provided in an Excel file named "PFC_Adhesive Calcs for 2002_022106.xls" along with this TSD.

Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont elected to use MANE-VU's default inventory which was added to Version 3. Massachusetts elected to use the per capita emission factor but provided revisions to the population data, used 2002 owner occupied units to allocate the emissions to counties, and then allocated emissions between the commercial (16%) and residential (84%) sectors. Massachusetts' calculations are provided in the spreadsheet named "Version 3 Revisions" in the Excel file named MA_AR_QA_Report_030806.xls" provided with this TSD.

- Industrial Adhesives: Emissions for industrial adhesives were missing in Version 2 for Connecticut, the District of Columbia, Delaware, Maryland, Massachusetts, and Rhode Island. MANE-VU estimated default 2002 emissions for these States using a per capita emission factor and county population data for each State. The derivation of the emission factor, population data, and calculation of annual and daily VOC emissions for industrial adhesives is provided in an Excel file named "PFC_Adhesive Calcs for 2002_022106.xls" along with this TWD.

  Massachusetts elected to use MANE-VU's gap-filling inventory which was added to Version 3. The rest of the States elected to use EPA's 2002 inventory which is based on a top-down, mass balance methodology where national industrial adhesive solvent estimates were allocated to counties using industrial employment. The EPA estimates were adjusted to remove uncontrolled VOC emissions included in the final 2002 point source NEI. The point-source adjustments were conducted at the county level. Note that the point-source-adjusted emissions for Rhode Island are zero for all three counties.

  Note New Jersey is the only State that prepared its own 2002 inventory for this category that is included in Version 3. The industrial adhesive inventory data for the rest of the MANE-VU States originates from the 1999 NEI. These States were contacted to determine if they wanted the 1999 data replaced with the default estimates or with the EPA's 2002 inventory for industrial adhesives. Maine commented that the 1999 estimates are more realistic of the solvent emissions for their State than the 2002 NEI or MANE-VU default estimates. The other States did not indicate that they wanted their data replaced. Therefore, the 1999 NEI data for Maine, New Hampshire, New York, Pennsylvania, and Vermont was not changed in Version 3 of MANE-VU's inventory.

- Residential Wood Burning: Residential outdoor wood burning emissions were missing in Version 2 of the MANE-VU inventory for the District of Columbia, Pennsylvania, Rhode Island, and Vermont. In Versions 1 and 2, New Jersey's and New York's emissions for outdoor wood burning were included with their inventory for indoor wood burning. The District of Columbia, Rhode Island, and Vermont elected to use MANE-VU's outdoor wood burning inventory which was added to Version 3. In addition, per direction provided by New Jersey, its wood burning inventory was replaced with the MANE-VU-sponsored indoor wood burning inventory in Version 3, and the MANE-VU outdoor wood burning inventory was added to Version 3.

New York's inventory in Version 2 included emissions for both residential indoor and outdoor wood burning. For Version 3, New York provided revisions that lowered its overall emissions relative to Version 2 and broke out its inventory to show emissions for fireplaces, woodstoves, and outdoor equipment separately. New York also added NH_3 emissions to its inventory for Version 3.

Adjustments to $PM_{2.5}$ Emissions for Fugitive Dust Categories

Information developed by the Western Governors' Association, Western Regional Air Partnership (WRAP) Dust Emissions Joint Forum and EPA indicates that, for paved and unpaved roads and the construction nonpoint source categories, the $PM_{2.5}$-to-PM_{10} ratio is lower than the ratio used in the EPA method to estimate PM25-PRI/-FIL emissions from PM10-PRI/-FIL emissions (WRAP, 2005). Therefore, for the final 2002 NEI, EPA applied an adjustment factor to the PM25-PRI/-FIL emissions to correct for overestimates of PM25-PRI/-FIL emissions for these categories. Because the $PM_{2.5}$-to-PM_{10} ratio used for the MANE-VU States is based on the EPA method, this information was communicated to the MANE-VU States and all of the States agreed that these adjustments should be made to the MANE-VU inventory. Table III-4 identifies the categories to which this adjustment was applied, the old and new $PM_{2.5}$-to-PM_{10} ratios, and the adjustment factors applied to the PM25-PRI/-FIL emissions in Version 3 of MANE-VU's inventory. Note that these adjustments to $PM_{2.5}$ emissions were applied prior to applying the transport adjustment factors for PM_{10} and $PM_{2.5}$ emissions. The modelers applied the transport adjustment factors to the mass emissions in Version 3. Documentation of the file containing the transport adjustment factors is provided under "Speciation Profiles" section of Table VII-1 in Chapter VII.

For the construction categories, the EPA assumed an original $PM_{2.5}$-to-PM_{10} ratio of 0.15 and an adjustment factor of 0.67. However, the original $PM_{2.5}$-to-PM_{10} ratio used for both the NEI method and MANE-VU's inventory for construction is 0.2. Based on discussions with EPA, the goal is to revise the original $PM_{2.5}$ emissions such that the $PM_{2.5}$-to-PM_{10} ratio is 0.1. Therefore, for Version 3 of MANE-VU's 2002 area source inventory, an adjustment factor of 0.5 (ratio of 0.1-to-0.2) was applied to adjust the $PM_{2.5}$ emissions.

Note that based on Pechan's discussions with EPA during the week of March 6, 2006 concerning the application of the paved road $PM_{2.5}$ adjustment factor, it was determined that adjusting the emissions by applying the factor (shown in Table III-4) to the $PM_{2.5}$ emissions is a simplistic approach. The EPA noted that it is evaluating this issue and will be issuing guidance in the near future for revising the equation for estimating $PM_{2.5}$ emissions which, when applied, will likely yield different results. Because EPA was unable to provide guidance on how to address this issue before Version 3 needed to be completed during the week of March 6, the adjustment factor shown in Table III-4 was applied to the $PM_{2.5}$ emissions for paved roads because this adjustment will provide a better estimate of $PM_{2.5}$ emissions than the unadjusted emissions.

Table III-4. Revisions to PM25-PRI and PM25-FIL Emissions for Paved and Unpaved Roads and Construction

SCC	SCC Description	Original $PM_{2.5}$-to-PM_{10} Ratio	Revised $PM_{2.5}$-to-PM_{10} Ratio	Adjustment Factor[1,2]
2294000000	Mobile Sources : Paved Roads : All Paved Roads : Total: Fugitives	0.25	0.15	0.6
2296000000	Mobile Sources : Unpaved Roads : All Unpaved Roads : Total: Fugitives	0.15	0.1	0.67
2296005000	Mobile Sources : Unpaved Roads : Public Unpaved Roads : Total: Fugitives	0.15	0.1	0.67
2296010000	Mobile Sources : Unpaved Roads : Industrial Unpaved Roads : Total: Fugitives	0.15	0.1	0.67
2311000000	Industrial Processes : Construction: SIC 15 - 17 : All Processes : Total	0.2	0.1	0.50
2311010000	Industrial Processes : Construction: SIC 15 - 17 : Residential : Total	0.2	0.1	0.50
2311010040	Industrial Processes : Construction: SIC 15 - 17 : Residential : Ground Excavations	0.2	0.1	0.50
2311020000	Industrial Processes : Construction: SIC 15 - 17 : Industrial/Commercial/Institutional : Total	0.2	0.1	0.50
2311020040	Industrial Processes : Construction: SIC 15 - 17 : Industrial/Commercial/Institutional : Ground Excavations	0.2	0.1	0.50
2311030000	Industrial Processes : Construction: SIC 15 - 17 : Road Construction : Total	0.2	0.1	0.50

[1] For these categories, filterable and primary emissions are equal because they are not sources of condensible emissions. The adjustment factor was applied to both the PM25-PRI and PM25-FIL emissions and emission factors in the MANE-VU inventory.
[2] See text for discussion of issue concerning the adjustment factor for paved road $PM_{2.5}$ emissions. Also, for construction, see text for explanation of $PM_{2.5}$ adjustment factor shown in this table.

Removal of Invalid CE Records

For the following SCCs, Version 2 contained invalid CE records for Connecticut, the District of Columbia, Maine, New Hampshire, New York, Pennsylvania, Rhode Island, and Vermont that were removed in Version 3:

SCC	SCC Description
2311020000	Construction: SIC 15 - 17 : Industrial/Commercial/Institutional : Total
2311030000	Construction: SIC 15 - 17 : Road Construction : Total
2610000100	Open Burning : All Categories : Yard Waste - Leaf Species Unspecified
2610000400	Open Burning : All Categories : Yard Waste - Brush Species Unspecified
2610030000	Open Burning : Residential : Household Waste

The CE records all originate from the preliminary 2002 NEI that have been removed from the final 2002 nonpoint NEI. They are invalid because they have a control efficiency value of 100% and corresponding records in the EM table with rule effectiveness and rule penetration values of 100% (implying that the emissions are zero), but with emissions greater than zero. The Excel spreadsheet file named "CE_records_removed from V3.xls" provides the CE records by State and county FIPS, SCC, and pollutant code that were removed in Version 3.

4. Version 3 Emissions Summary

Table III-5 presents a State-level summary of the annual area source emissions in Version 3 of the 2002 MANE-VU inventory. Note that PM10-PRI and PM25-PRI emissions are included in the inventory for all SCCs for which State agencies reported any form of PM, PM_{10}, and/or $PM_{2.5}$ emissions. If an agency did not report PM10-PRI and/or PM25-PRI but reported PM-PRI, PM-FIL, PM-CON, PM10-FIL, and/or PM25-FIL, the PM augmentation procedures discussed in the TSD were applied to the form of PM emissions supplied by the agency to calculate emissions for the other forms of PM emissions. If an agency reported PM10-PRI and/or PM25-PRI emissions but not PM10-FIL, PM25-FIL, or PM-CON emissions, the agency's inventory was not augmented to calculate filterable or condensible emissions. Note that PM-CON is associated with only fuel combustion sources.

For NH_3, the area source inventory includes emissions for natural sources for the following States: SCCs 28060xxxxx for domestic cats and dogs in Delaware, Massachusetts, and New Jersey; 28070xxxxx for wild animals in Delaware, Massachusetts, New Jersey, and New York; and SCC 2810010000 for human perspiration in Delaware, Massachusetts, and New Jersey. The area source inventory also includes NH_3 biogenic emissions (SCC 2701420000) for Massachusetts.

Table III-5. Version 3 2002 MANE-VU Area Source Emissions by State (Tons/Year)

State	CO	NH_3	NO_x	PM10-FIL	PM10-PRI	PM25-FIL	PM25-PRI	PM-CON	SO_2	VOC
Connecticut	70,198	5,318	12,689	37,790	48,281	4,038	14,247	846	12,418	87,302
Delaware	14,052	13,279	2,608	12,910	13,039	3,075	3,204	128	1,588	15,519
District of Columbia	2,300	14	1,644	5,745	6,293	507	1,029	147	1,337	6,432
Maine	109,223	8,747	7,360	155,237	168,953	19,090	32,774	686	13,149	100,621
Maryland	141,178	25,834	15,678	31,116	95,060	3,375	27,318	611	12,393	120,254
Massachusetts	136,552	18,809	31,358	150,046	192,839	23,354	42,067	1,156	54,923	162,016
New Hampshire	79,647	2,158	10,960	32,138	43,328	6,688	17,532	449	7,072	65,370
New Jersey	97,657	17,572	26,692	37,282	61,601	2,811	19,350	476	10,744	167,882
New York	356,254	67,422	98,803	288,991	369,595	30,894	87,154	102	130,409	507,292
Pennsylvania	266,935	79,911	47,591	363,173	391,897	51,792	74,925	266	63,679	240,785
Rhode Island	8,007	883	3,886	7,090	8,295	887	2,064	336	4,557	31,402
Vermont	43,849	9,848	3,208	51,392	56,131	6,729	11,065	180	4,087	23,265
MANE-VU	**1,325,853**	**249,795**	**262,477**	**1,172,909**	**1,455,311**	**153,243**	**332,729**	**5,383**	**316,357**	**1,528,141**

B. State-Specific Methods

For each of the MANE-VU States, this section identifies the temporal basis of the emissions included in Version 3 and discusses revisions incorporated into Version 3. In addition, this section also discusses the origin of each State agency's emissions included in Version 3. For each agency, a table is provided in Appendix B that lists the data source codes by SCC, emission type period, and pollutant. In addition, an electronic folder is provided for each State agency containing the QA Summary Reports prepared for Versions 1, 2, and/or 3 and other files documenting revisions included in Versions 2 and 3. Except for Rhode Island, a QA Summary Report was prepared for Version 1. Subsequently, a QA Summary Report was prepared for States that provided Version 2 or 3 revisions. Rhode Island elected to use EPA's draft 2002 NEI for Versions 1 and 2 but provided revisions for Version 3; therefore, a QA Summary Report is available for Version 3 only for Rhode Island.

1. Connecticut

Table III-6 shows the emission type periods for which Connecticut provided emissions.

Table III-6. Connecticut 2002 Area, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
DAILY	20011201	20020228	27
DAILY	20020601	20020831	27
DAILY	20020601	20020831	29

Table B-1 in Appendix B identifies the data sources by SCC, emission type period, and pollutant in the Version 3 area source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. Connecticut provided 2002 emissions for many of the area source categories in Version 3. Connecticut elected to use the EPA's 2002 inventory for industrial adhesives. Connecticut elected to use MANE-VU-sponsored inventories for the following source categories:

- Annual and daily VOC, NO_x, CO, NH_3, PM10-PRI, PM25-PRI, and SO_2 emissions for indoor and outdoor residential wood combustion;
- Annual PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL emissions for paved and unpaved roads;
- Annual and daily NH_3 emissions for industrial refrigeration processes;
- Annual and daily VOC emissions for PFCs; and
- Annual and daily VOC and NH_3 emissions for composting.

Emissions for the remaining area source categories were taken from the draft 2002 NEI. For Connecticut, these emissions are either based on 2002 data prepared by EPA or carried forward from final Version 3 of the 1999 NEI. Data carried forward from the 1999 NEI originate from either State data included in the 1999 NEI or EPA data developed for the 1999 NEI.

2. Delaware

Table III-7 shows the emission type periods for which Delaware provided emissions.

Table III-7. Delaware 2002 Area, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type	Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20020831	30	DAILY	20011201	20020228	27
ANNUAL	20020101	20021231	30	DAILY	20020101	20020831	27
ANNUAL	20020512	20020512	30	DAILY	20020512	20020512	27
ANNUAL	20020629	20020629	30	DAILY	20020601	20020831	27
ANNUAL	20021029	20021029	30	DAILY	20020629	20020629	27
ANNUAL	20021104	20021104	30	DAILY	20021029	20021029	27
ANNUAL	20021205	20021205	30	DAILY	20021104	20021104	27
				DAILY	20021205	20021205	27

Table B-2 in Appendix B identifies the data sources by SCC, emission type period, and pollutant in the Version 3 area source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. Delaware provided 2002 emissions for the majority of the area source categories in Version 3, and used 2002 data that EPA prepared for the draft 2002 NEI or MANE-VU-sponsored inventories for the remaining categories. Delaware elected to use the EPA's 2002 inventory for industrial adhesives, and prepared its own inventory for PFCs. Delaware elected to use data from MANE-VU-sponsored inventories for the following source categories:

- Annual and daily VOC, NO_x, CO, NH_3, PM10-PRI, PM25-PRI, and SO_2 emissions for indoor and outdoor wood burning;
- Annual PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL emissions for paved roads (note: there are no unpaved roads in Delaware);
- Annual and daily NH_3 emissions for POTWs; and
- Annual VOC, NO_x, CO, NH_3, PM10-PRI, PM10-FIL, PM25-PRI, PM25-FIL, and SO_2 emissions for open burning categories.

3. District of Columbia

Table III-8 shows the emission type periods for which the District of Columbia provided emissions.

Table III-8. District of Columbia 2002 Area, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
DAILY	20011201	20020228	27
DAILY	20020601	20020831	27

Table B-3 in Appendix B identifies the data sources by SCC, emission type period, and pollutant in the Version 3 area source inventory. This table also shows the number of counties by SCC. The District of Columbia provided 2002 emissions for the majority of the area source categories in Version 3. The District of Columbia provided annual VOC emissions for PFCs for Version 2 that were kept in Version 3. The District of Columbia elected to use the EPA's 2002 inventory for industrial adhesives and indoor wood burning. The exception is for the following categories for which the District of Columbia elected to use data from MANE-VU-sponsored inventories:

- Annual and daily VOC, NO_x, CO, NH_3, PM10-PRI, PM25-PRI, and SO_2 emissions for outdoor wood burning;
- Annual PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL emissions for paved roads (note: there are no unpaved roads in the District of Columbia);
- Annual and daily VOC and NH_3 emissions for composting; and
- Annual VOC, NO_x, CO, NH_3, PM10-PRI, PM25-PRI, and SO_2 emissions for open burning categories.

4. Maine

Table III-9 shows the emission type periods for which Maine provided emissions.

Table III-9. Maine 2002 Area, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
DAILY	20011201	20020228	27
DAILY	20020601	20020831	27
DAILY	20020601	20020831	29
DAILY	20020601	20020929	29

Table B-4 in Appendix B identifies the data sources by SCC, emission type period, and pollutant in the Version 3 area source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. Maine provided 2002 emissions for many of the area source categories in Version 3. Maine's inventory for industrial adhesives originates from the 1999 NEI. Maine provided annual and daily VOC and annual NH_3 emissions for industrial wastewater treatment that were added to Version 3. Maine elected to use data from MANE-VU-sponsored inventories for the following source categories:

- Annual and daily VOC, NO_x, CO, NH_3, PM10-PRI, PM25-PRI, and SO_2 emissions for indoor and outdoor wood burning;
- Annual PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL emissions for paved and unpaved roads;
- Annual and daily VOC emissions for PFCs; and
- Annual and daily VOC and NH_3 emissions for composting.

5. Maryland

Table III-10 shows the emission type periods for which Maryland provided emissions. Table B-5 in Appendix B identifies the data sources by SCC, emission type period, and pollutant in the Version 3 area source inventory. This table also shows the number of counties by SCC.

Table III-10. Maryland 2002 Area, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type	Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30	MONTHLY	20020101	20020131	30
SEASONAL	20020401	20020930	30	MONTHLY	20020201	20020228	30
SEASONAL	20020401	20021031	30	MONTHLY	20020301	20020331	30
SEASONAL	20020601	20020831	30	MONTHLY	20020401	20020430	30
DAILY	20011201	20020228	27	MONTHLY	20020501	20020531	30
DAILY	20020101	20021231	29	MONTHLY	20020601	20020630	30
DAILY	20020401	20020930	29	MONTHLY	20020701	20020731	30
DAILY	20020401	20021031	29	MONTHLY	20020801	20020831	30
DAILY	20020601	20020831	27	MONTHLY	20020901	20020930	30
DAILY	20020601	20020831	29	MONTHLY	20021001	20021031	30
				MONTHLY	20021101	20021130	30
				MONTHLY	20021201	20021231	30

Maryland provided 2002 annual, seasonal, and daily emissions for the majority of the area source categories in Version 3 and used 2002 data that EPA prepared for the draft 2002 NEI for industrial adhesives and commercial cooking. Maryland prepared its own inventory for PFCs.

Maryland elected to use data from MANE-VU-sponsored inventories for the following source categories:

- Annual and daily VOC, NO_x, CO, NH_3, PM10-PRI, PM25-PRI, and SO_2 emissions for indoor and outdoor wood burning;
- Annual PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL emissions for paved and unpaved roads;
- Annual VOC, NO_x, CO, NH_3, PM10-PRI, PM10-FIL, PM25-PRI, PM25-FIL, and SO_2 emissions for open burning categories; and
- Annual and monthly NH_3 emissions for agricultural crop fertilizers.

For Version 2, Maryland provided revisions to annual, seasonal, and daily VOC emissions for SCC 2505030120 (Storage and Transport : Petroleum and Petroleum Product Transport : Truck : Gasoline). Maryland also removed PM10-FIL and PM25-FIL annual, seasonal, and daily records for open burning of land clearing debris (SCC 2610000500). Maryland had revised the PM10-PRI and PM25-PRI emissions in an earlier version of the MANE-VU inventory but not the PM10-FIL and PM25-FIL. As a result of revising the primary emissions, the filterable emissions were no longer met the consistency check as compared to the primary emissions.

QA of PM emissions in Version 3 identified one record for Maryland in county 510 for SCC 2801000003 (Agriculture - Crops : Tilling) where PM10-PRI annual emissions are 2317.2 tons and PM25-PRI annual emissions are 0 tons. For the other counties in Maryland with this SCC, PM25-PRI emissions are about 20% of the PM10-PRI emissions. This issue was not addressed due to time and resource constraints for completing revisions to Version 3.

6. Massachusetts

Table III-11 shows the emission type periods for which Massachusetts provided emissions.

Table III-11. Massachusetts 2002 Area, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
DAILY	20011201	20020228	27
DAILY	20020601	20020831	27
DAILY	20020601	20020831	29

Table B-6 in Appendix B identifies the data sources by SCC, emission type period, and pollutant in the Version 3 area source inventory. This table also shows the number of counties by SCC. Massachusetts provided 2002 annual and daily emissions for the majority of the area source categories in Version 3 and used 2002 data that EPA prepared for the draft 2002 NEI for residential coal combustion, asphalt roofing, and agricultural livestock (NH_3).

Massachusetts elected to use data from MANE-VU-sponsored inventories for the following source categories:

- Annual and daily VOC, NO_x, CO, NH_3, PM10-PRI, PM25-PRI, and SO_2 emissions for indoor and outdoor wood burning;
- Annual PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL emissions for paved and unpaved roads;
- Annual and daily VOC emissions for industrial adhesives and PFCs;
- Annual and daily NH_3 emissions for industrial refrigeration processes;
- Annual and daily VOC and NH_3 emissions for composting; and
- Annual VOC, NO_x, CO, NH_3, PM10-PRI, PM10-FIL, PM25-PRI, PM25-FIL, and SO_2 emissions for open burning categories.

For Version 2, Massachusetts revised annual and summer day VOC emissions for 14 counties for the following categories: aircraft refueling, surface coating, degreasing, miscellaneous non-industrial: consumer and commercial products and pesticides, and gasoline service stations (stage 1: balanced submerged fill). Massachusetts also revised annual and daily emissions for 14 counties for forest wildfires, revised annual emissions for four counties for residential open burning of brush using the correct rule penetration factors for the counties, and revised control efficiency and control device data for selected categories in the CE table.

For Version 3, Massachusetts revised annual and summer day VOC emissions for 14 counties for auto refinishing. In the CE table, Massachusetts changed control device code 102 (low-solvent coatings) to 000 (uncontrolled) and associated control efficiency values were set to null for all counties. Massachusetts also added annual and summer day VOC emissions for 14 counties for gasoline service stations (stage 2: displacement loss/controlled).

For PFCs, Massachusetts elected to use the per capita emission factor but provided revisions to the population data, used 2002 owner occupied units to allocate the emissions to counties, and then allocated emissions between the commercial (16%) and residential (84%) sectors. Massachusetts' calculations are provided in the spreadsheet named "Version 3 Revisions" in the Excel file named MA_AR_QA_Report_030806.xls".

7. New Hampshire

Table III-12 shows the emission type periods for which New Hampshire provided emissions. Table B-7 in Appendix B identifies the data sources by SCC, emission type period, and pollutant in the Version 3 area source inventory. This table also shows the number of counties by SCC. New Hampshire provided 2002 emissions for many of the area source categories in Version 3. New Hampshire's inventory for industrial adhesives originates from the 1999 NEI.

Table III-12. New Hampshire 2002 Area, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
DAILY	20011201	20020228	27
DAILY	20020601	20020831	27
DAILY	20020601	20020831	29
MONTHLY	20020101	20020131	30
MONTHLY	20020201	20020228	30
MONTHLY	20020301	20020331	30
MONTHLY	20020401	20020430	30
MONTHLY	20020501	20020531	30
MONTHLY	20020601	20020630	30
MONTHLY	20020701	20020731	30
MONTHLY	20020801	20020831	30
MONTHLY	20020901	20020930	30
MONTHLY	20021001	20021031	30
MONTHLY	20021101	20021130	30
MONTHLY	20021201	20021231	30

New Hampshire elected to use data from MANE-VU-sponsored inventories for the following source categories:

- Annual and daily VOC, NO_x, CO, NH_3, PM10-PRI, PM25-PRI, and SO_2 emissions for indoor and outdoor wood burning;
- Annual PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL emissions for paved and unpaved roads;
- Annual and daily VOC emissions for PFCs;
- Annual and daily NH_3 emissions for industrial refrigeration processes and POTWs;
- Annual and daily VOC and NH_3 emissions for composting;
- Annual VOC, NO_x, CO, NH_3, PM10-PRI, PM25-PRI, and SO_2 emissions for open burning categories; and
- Annual and monthly NH_3 emissions for agricultural crop fertilizers and livestock.

Emissions for the remaining area source categories were taken from the draft 2002 NEI; these emissions are either based on 2002 data prepared by EPA or EPA data carried forward from final Version 3 of the 1999 NEI.

New Hampshire provided revisions to Version 2 that were kept in Version 3. For Version 2, New Hampshire revised annual and daily VOC emissions for the gasoline storage and transport sector to reflect revisions it made to the 2002 inventory that EPA prepared for the 2002 NEI. The categories revised include bulk plant breathing losses, gasoline service stations (stages 1 and 2 total and underground tank breathing and emptying losses), and gasoline tank trucks.

8. New Jersey

Table III-13 shows the emission type periods for which New Jersey provided emissions.

Table III-13. New Jersey 2002 Area, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
DAILY	20011201	20020228	27
DAILY	20011201	20020228	29
DAILY	20020601	20020831	27
DAILY	20020601	20020831	29

Table B-8 in Appendix B identifies the data sources by SCC, emission type period, and pollutant in the Version 3 area source inventory. This table also shows the number of counties by SCC. New Jersey provided 2002 emissions for the majority of the area source categories. New Jersey provided its own 2002 inventory for industrial adhesives and PFCs. Emissions for the remaining area source categories were taken from the draft 2002 NEI (that are either based on 2002 data prepared by EPA or EPA data carried forward from final Version 3 of the 1999 NEI) or MANE-VU-sponsored inventories. New Jersey elected to use MANE-VU-sponsored inventories for the following source categories:

- Annual and daily VOC, NO_x, CO, NH_3, PM10-PRI, PM25-PRI, and SO_2 emissions for indoor and outdoor residential wood combustion (replacing New Jersey's indoor residential wood combustion inventory provided in Versions 1 and 2);
- Annual PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL emissions for paved roads;
- Annual and daily NH_3 emissions for industrial refrigeration processes and POTWs; and
- Annual and daily VOC and NH_3 emissions for composting.

For Version 3, New Jersey added annual and summer day VOC emissions for 21 counties for SCC 2501060100 (gasoline service stations : stage 2: total). The emissions are summarized in the spreadsheet named "Version 3 Revisions" in the Excel file named "NJ_AR_QA_Report_ 030806.xls". New Jersey provided 2002 emissions data for the industrial adhesives and PFC categories in Version 1. For Version 2, New Jersey corrected PM25-PRI emissions that were greater than PM10-PRI emissions for SCC 2601000000 (on-site incineration : all categories : total).

9. New York

Table III-14 shows the emission type periods for which New York provided emissions. Table B-9 in Appendix B identifies the data sources by SCC, emission type period, and pollutant in the Version 3 area source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination or because emissions are not reported for all pollutants for the same SCC and emission type period combination.

Table III-14. New York 2002 Area, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
MONTHLY	20020101	20020131	30
MONTHLY	20020201	20020228	30
MONTHLY	20020301	20020331	30
MONTHLY	20020401	20020430	30
MONTHLY	20020501	20020531	30
MONTHLY	20020601	20020630	30
MONTHLY	20020701	20020731	30
MONTHLY	20020801	20020831	30
MONTHLY	20020901	20020930	30
MONTHLY	20021001	20021031	30
MONTHLY	20021101	20021130	30
MONTHLY	20021201	20021231	30

New York provided revisions to annual emissions for all 62 counties for the categories and pollutants shown in Table III-15. This revision completely replaced the 2002 emissions that New York provided in Version 2. Table III-15 also identifies categories and pollutants for which emissions were added to Version 3 (i.e., not in Version 2). The emissions are summarized in the spreadsheet named "Version 3 Revisions" in the Excel file named NY_AR_QA_Report_030806.xls".

New York's inventory in Version 2 included emissions for both residential indoor and outdoor wood burning. For Version 3, New York provided revisions that lowered its overall emissions relative to Version 2 and broke out its inventory to show emissions for fireplaces, woodstoves, and outdoor equipment separately. New York also added NH_3 emissions to its inventory for Version 3. New York's inventory for industrial adhesives originates from the 1999 NEI. New York provided its own 2002 inventory for PFCs. Emissions for the remaining area source categories were taken from the draft 2002 NEI (that are either based on 2002 data prepared by EPA or EPA data carried forward from final Version 3 of the 1999 NEI) or MANE-VU-sponsored inventories.

New York elected to use MANE-VU-sponsored inventories for the following source categories:

- Annual PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL emissions for paved and unpaved roads;
- Annual and daily NH_3 emissions for agricultural livestock; and
- Annual VOC, NO_x, CO, NH_3, PM10-PRI, PM25-PRI, and SO_2 emissions for open burning categories.

A QA issue that may affect the use of the MANE-VU inventory for air quality modeling and revisions to the projection year inventory is the addition of SCCs 2103004001 and 2103004002 by New York that are not in EPA's master SCC list used by the EPA QA program. These SCCs are defined in Table III-15. In addition, the QA program shows SCCs for PFCs and outdoor wood burning as invalid because EPA has not updated the master list to include these SCCs for the EPA QA program. These SCCs were included in Version 2 and should have been assigned speaciation profiles and included in the projection year inventory prepared from Version 2.

Table III-15. Summary of New York's Revisions to Version 3 of MANE-VU's Area Source Inventory

SCC	SCC Description	Pollutant	Type of Revision to Emissions
Revisions to Waste Disposal, Treatment, and Recovery : Wastewater Treatment			
2630020000	Public Owned : Total Processed	VOC	Revised emissions for all pollutants
Revisions to Stationary Source Fuel Combustion : Residential : Wood			
2104008001	Fireplaces: General	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Added NH3, revised emissions for rest of pollutants
2104008052	Non-catalytic Woodstoves: Low Emitting	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Added emissions for all pollutants
2104008070	Outdoor Wood Burning Equipment	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Added emissions for all pollutants
Revisions to Stationary Source Fuel Combustion : Electric Utility			
2101001000	Anthracite Coal : Total: All Boiler Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	No change to emissions
2101002000	Bituminous/Subbituminous Coal : Total: All Boiler Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2101004000	Distillate Oil : Total: Boilers and IC Engines	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2101005000	Residual Oil : Total: All Boiler Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2101006000	Natural Gas : Total: Boilers and IC Engines	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
Revisions to Stationary Source Fuel Combustion : Industrial			
2102001000	Anthracite Coal : Total: All Boiler Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	No change to emissions
2102002000	Bituminous/Subbituminous Coal : Total: All Boiler Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2102004000	Distillate Oil : Total: Boilers and IC Engines	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2102005000	Residual Oil : Total: All Boiler Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2102006000	Natural Gas : Total: Boilers and IC Engines	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2102007000	Liquified Petroleum Gas (LPG) : Total: All Boiler Types	VOC, NOX, CO, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2102008000	Wood : Total: All Boiler Types	VOC, NOX, CO, SO2, PM10-PRI, PM25-PRI	No change to emissions
2102011000	Kerosene : Total: All Boiler Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Added emissions for all pollutants
Revisions to Stationary Source Fuel Combustion : Commercial/Institutional			
2103001000	Anthracite Coal : Total: All Boiler Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	No change to emissions
2103002000	Bituminous/Subbituminous Coal : Total: All Boiler Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2103005000	Residual Oil : Total: All Boiler Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2103004000	Residual Oil : Total: Boilers and IC Engines	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Removed and replaced with data for SCCs 2103004001 and 2103004002
2103004001	Distillate Oil : Boilers	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Added emissions for all pollutants
2103004002	Distillate Oil : IC Engines	VOC, NOX, CO, SO2, PM10-PRI, PM25-PRI	Added emissions for all pollutants
2103006000	Natural Gas : Total: Boilers and IC Engines	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2103007000	Liquified Petroleum Gas (LPG) : Total: All Combustor Types	VOC, NOX, CO, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2103008000	Wood : Total: All Boiler Types	VOC, NOX, CO, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2103011000	Kerosene : Total: All Combustor Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Added emissions for all pollutants

Table III-15. Summary of New York's Revisions to Version 3 of MANE-VU's Area Source Inventory (Continued)

SCC	SCC Description	Pollutant	Type of Revision to Emissions
Revisions to Stationary Source Fuel Combustion : Residential			
2104001000	Anthracite Coal : Total: All Combustor Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	No change to emissions
2104002000	Bituminous/Subbituminous Coal : Total: All Combustor Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2104004000	Distillate Oil : Total: All Combustor Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2104006010	Natural Gas : Residential Furnaces	VOC, NOX, CO, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2104007000	Liquified Petroleum Gas (LPG) : Total: All Combustor Types	VOC, NOX, CO, SO2, PM10-PRI, PM25-PRI	Revised emissions for all pollutants
2104011000	Kerosene : Total: All Heater Types	VOC, NOX, CO, NH3, SO2, PM10-PRI, PM25-PRI	Added emissions for all pollutants

10. Pennsylvania

Table III-16 shows the emission type periods for which Pennsylvania provided emissions.

Table III-16. Pennsylvania 2002 Area, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type	Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30	MONTHLY	20020101	20020131	30
DAILY	20011201	20020228	27	MONTHLY	20020201	20020228	30
DAILY	20020601	20020831	27	MONTHLY	20020301	20020331	30
				MONTHLY	20020401	20020430	30
				MONTHLY	20020501	20020531	30
				MONTHLY	20020601	20020630	30
				MONTHLY	20020701	20020731	30
				MONTHLY	20020801	20020831	30
				MONTHLY	20020901	20020930	30
				MONTHLY	20021001	20021031	30
				MONTHLY	20021101	20021130	30
				MONTHLY	20021201	20021231	30

Table B-10 in Appendix B identifies the data sources by SCC, emission type period, and pollutant in the Version 3 area source inventory. This table also shows the number of counties by SCC. Note that some SCC and emission type period combinations are listed more than once because the data source codes are different for more than one SCC and emission type period combination. Pennsylvania provided 2002 emissions for the majority of the area source categories. Pennsylvania provided its own 2002 inventory for PFCs and residential indoor wood burning. Pennsylvania's inventory for industrial adhesives originates from the 1999 NEI. Emissions for the remaining area source categories were taken from the draft 2002 NEI (that are either based on 2002 data prepared by EPA or EPA data carried forward from final Version 3 of the 1999 NEI) or MANE-VU-sponsored inventories.

Pennsylvania elected to use MANE-VU-sponsored inventories for the following source categories:

- Annual PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL emissions for paved and unpaved roads;
- Annual and daily NH_3 emissions for industrial refrigeration processes and agricultural crop fertilizers and livestock;
- Annual and daily VOC and NH_3 emissions for POTWs and composting; and
- Annual VOC, NO_x, CO, NH_3, PM10-PRI, PM25-PRI, and SO_2 emissions for open burning categories.

11. Rhode Island

Table III-17 shows the emission type periods for which Rhode Island provided emissions.

Table III-17. Rhode Island 2002 Area, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
DAILY	20011201	20020228	27
DAILY	20020601	20020831	27
DAILY	20020601	20020831	29

Table B-11 in Appendix B identifies the data sources by SCC, emission type period, and pollutant in the Version 3 area source inventory. This table also shows the number of counties by SCC. Rhode Island provided 2002 annual VOC emissions for several solvent utilization categories (surface coating, degreasing, graphic arts, rubber/plastics, and industrial adhesive); annual and daily VOC emissions for petroleum and petroleum product storage (gasoline service stations and all transport types); and annual VOC emissions for POTWs. Rhode Island's indoor wood burning inventory originates from the draft 2002 NEI. Emissions for the remaining area source categories were taken from the draft 2002 NEI (that are either based on 2002 data prepared by EPA or EPA data carried forward from final Version 3 of the 1999 NEI) or MANE-VU-sponsored inventories.

Rhode Island elected to use MANE-VU-sponsored inventories for the following source categories:

- Annual and daily VOC, NO_x, CO, NH_3, PM10-PRI, PM25-PRI, and SO_2 emissions for outdoor wood burning;
- Annual PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL emissions for paved and unpaved roads; and
- Annual and daily VOC emissions for PFCs.

12. Vermont

Table III-18 shows the emission type periods for which Vermont provided emissions.

Table III-18. Vermont 2002 Area, Version 3: Unique List of Start Date, End Date, and Emission Types

Emission Type Period	Start Date	End Date	Emission Type
ANNUAL	20020101	20021231	30
DAILY	20011201	20020228	27
DAILY	20020601	20020831	27
DAILY	20020601	20020831	29

Table B-12 in Appendix B identifies the data sources by SCC, emission type period, and pollutant in the Version 3 area source inventory. This table also shows the number of counties by SCC. Vermont provided 2002 annual VOC, NO_x, CO, PM10-PRI or PM10-FIL, PM25-PRI or PM25-FIL, and SO_2 emissions for residential fuel combustion (distillate oil, natural gas, LPG, and indoor wood burning); annual VOC emissions for gasoline service stations and breathing losses at bulk terminals; annual VOC, NO_x, CO, PM10-PRI, PM25-PRI, and SO_2 emissions for residential open burning; annual VOC, NO_x, CO, NH_3, PM10-PRI, and PM25-PRI emissions for forest fires, and annual VOC, NO_x, CO, PM10-PRI, and PM25-PRI emissions for structure fires. Vermont's inventory for industrial adhesives originates from the 1999 NEI.

For Version 2, Vermont provided revisions to EPA's draft 2002 inventory for SCC 2501050120 (bulk stations and terminals : breathing loss : gasoline) to incorporate the effects of vapor balance controls not accounted for in the EPA estimates. The revised inventory for this category was added to Version 2 (and kept in Version 3) that did not include this category. Control records were added to the NIF 3.0 CE table for the counties with vapor balance controls. In addition, Vermont provided emissions for three counties (i.e., county FIPS codes 50015, 50017, and 50019) that were not in EPA's inventory. Emissions for the remaining area source categories were taken from the draft 2002 NEI (that are either based on 2002 data prepared by EPA or EPA data carried forward from final Version 3 of the 1999 NEI) or MANE-VU-sponsored inventories. Vermont elected to use MANE-VU-sponsored inventories for the following source categories:

- Annual and daily VOC, NO_x, CO, NH_3, PM10-PRI, PM25-PRI, and SO_2 emissions for outdoor wood burning;
- Annual PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL emissions for paved and unpaved roads;
- Annual and daily NH_3 emissions for industrial refrigeration processes and POTWs;
- Annual and daily VOC emissions for PFCs;
- Annual and daily VOC and NH_3 emissions for composting; and
- Annual VOC, NO_x, CO, NH_3, PM10-PRI, PM10-FIL, PM25-PRI, PM25-FIL, and SO_2 emissions for open burning categories.

C. What Issues Need to be Addressed in Future Versions?

This section provides a summary of potential revisions to incorporate into future versions of the MANE-VU area source inventory.

All States – A coordinated effort between the State agencies should be developed to apply consistent methods to avoid having to apply procedures to augment inventory data to correct for the QA issues and fill in missing data as discussed previously in this chapter. For example, this will ensure that consistent methods are applied across State agencies to ensure consistent and accurate reporting of source categories using the same SCCs across States, PM emissions, and minimize other QA issues that were identified during the development of Versions 1, 2, and 3 of the inventory.

For PM emissions, the State agencies should develop and apply a consistent method for including condensible emissions for fuel combustion sources that can be applied when the agencies develop their inventories. This may include compiling the emission factors for all forms of PM into one database, organized by SCC and control type (for filterable emissions), and sharing the database among the MANE-VU State agencies. Use of a consistent set of emission factors will help to avoid the PM consistency issues identified in Versions 1, 2, and 3 of the MANE-VU inventory as well as ensure that condensible emissions are included in the primary emissions reported in the inventory.

State-specific suggestions are as follows:

Delaware: Revise the residential wood combustion emissions inventory with the latest revisions sponsored by MARAMA.

Rhode Island: This State felt that the area sources (from the nonpoint inventory EPA prepared) which they had changed to zeros in Version 3 would revert back to the Version 2 numbers which were from the EPA report. Rhode Island would like to see this change in the next version of the inventory. (Table with changes can be received upon request).

New Jersey:

- Why is the EPA VOC emission factor for fireplaces completely out of proportion with the other emission factors? The ratio of conventional wood stoves/fireplaces = 0% to 10% for other pollutants and is 77% for VOC. It is discussed in the Pechan Technical Memo #5, 9/3/03, page 19, how a study of the accuracy of the emission factors showed the VOC should be more like 10 to 30 lb/ton, instead of 229 lb/ton and the woodstove emission factors (certified) should be higher than Emission Inventory Improvement Program guidance.

- The summer seasonal adjustment factors for indoor wood burning used in the model appear high. This combined with the very high VOC emission factor results in high ozone season wood burning emissions.

- In general, the accuracy of the very large residential wood burning numbers, all pollutants.
- The large fugitive dust inventory numbers don not correlate to dust found in monitors, even with the latest 30% to 40% reduction in paved and unpaved road emissions.
- We need consistent guidance from the EPA for adhesives and sealants, PFC, and commercial cooking.

CHAPTER IV – NONROAD SOURCES

A. General Methods for all States

This section provides an overview of the data sources and QA steps used in preparing the 2002 nonroad sector inventory for the MANE-VU States. The nonroad sector is comprised of nonroad engines included in EPA's NONROAD model, as well as other engines not modeled in NONROAD, including aircraft, commercial marine vessels and locomotives.

1. What Data Sources Were Used?

Data sources used for the various nonroad categories are described below.

a. Aircraft, Commercial Marine, and Locomotive Categories

As a starting point, aircraft, commercial marine vessel and locomotive inventories were prepared using the inventories that State agencies submitted to the EPA in June 2004 as a requirement of the CERR. In addition, some States provided data directly to MANE-VU for use in this inventory that were not submitted for the CERR.

Missing data were supplemented with estimates from EPA's preliminary 2002 NEI. For the aircraft and commercial marine vessel source categories, the 2002 NEI CAP emissions were estimated by carrying over the 2001 estimates. 2001 emissions were estimated using the methodologies described in EPA's *Documentation for Aircraft, Commercial Marine Vessel, Locomotive, and Other Nonroad Components of the National Emissions Inventory* (EPA, 2003b). The 2002 locomotive emissions were calculated using 2002 activity data and the methodologies described in the EPA, 2003b documentation.

Table IV-1 provides a summary of the aircraft, commercial marine, and locomotive emission SCCs reported in the MANE-VU inventory. Table IV-2 provides a summary of the basis for these nonroad subsector emissions by State.

Table IV-1. List of Unique Aircraft, Commercial Marine, and Locomotive SCCs Reported by States in MANE-VU Inventory

SCC	SCC Description 1	SCC Description 2	SCC Description 3	SCC Description 4
2275000000	Mobile Sources	Aircraft	All Aircraft Types and Operations	Total
2275001000	Mobile Sources	Aircraft	Military Aircraft	Total
2275020000	Mobile Sources	Aircraft	Commercial Aircraft	Total: All Types
2275050000	Mobile Sources	Aircraft	General Aviation	Total
2275060000	Mobile Sources	Aircraft	Air Taxi	Total
2275070000	Mobile Sources	Aircraft	Aircraft Auxiliary Power Units	Total
2280000000	Mobile Sources	Marine Vessels, Commercial	All Fuels	Total, All Vessel Types
2280002000	Mobile Sources	Marine Vessels, Commercial	Diesel	Total, All Vessel Types
2280002010	Mobile Sources	Marine Vessels, Commercial	Diesel	Ocean-going Vessels
2280002020	Mobile Sources	Marine Vessels, Commercial	Diesel	Harbor Vessels
2280002100	Mobile Sources	Marine Vessels, Commercial	Diesel	Port emissions
2280002200	Mobile Sources	Marine Vessels, Commercial	Diesel	Underway emissions
2280003100	Mobile Sources	Marine Vessels, Commercial	Residual	Port emissions
2280003200	Mobile Sources	Marine Vessels, Commercial	Residual	Underway emissions
2285000000	Mobile Sources	Railroad Equipment	All Fuels	Total
2285002000	Mobile Sources	Railroad Equipment	Diesel	Total
2285002005	Mobile Sources	Railroad Equipment	Diesel	Total Line Haul Locomotives
2285002006	Mobile Sources	Railroad Equipment	Diesel	Line Haul Locomotives: Class I Operations
2285002007	Mobile Sources	Railroad Equipment	Diesel	Line Haul Locomotives: Class II / III Operations
2285002008	Mobile Sources	Railroad Equipment	Diesel	Line Haul Locomotives: Passenger Trains (Amtrak)
2285002009	Mobile Sources	Railroad Equipment	Diesel	Line Haul Locomotives: Commuter Lines
2285002010	Mobile Sources	Railroad Equipment	Diesel	Yard Locomotives

Table IV-2. Summary of Basis for 2002 MANE-VU Aircraft, Commercial Marine, and Locomotive Inventory

FIPSST	State	Basis for Subsector of Nonroad Inventory		
		Aircraft	Commercial Marine Vessels	Locomotives
09	Connecticut	2002 Preliminary NEI	2002 Preliminary NEI	State supplied in March 2006
10	Delaware	June 2004 CERR Submittal; State supplied revisions in Sep 2004	June 2004 CERR Submittal	June 2004 CERR Submittal
11	District of Columbia	Not supplied by State and not available from NEI	2002 Preliminary NEI	June 2004 CERR Submittal
23	Maine	State supplied in Oct 2004	State supplied in Oct 2004	State supplied in Oct 2004
24	Maryland	June 2004 CERR Submittal; State supplied revisions in Sep 2004	June 2004 CERR Submittal; State supplied revisions in Oct 2004	June 2004 CERR Submittal
25	Massachusetts	June 2004 CERR Submittal	State-supplied for June 2004 CERR Submittal, with revisions as directed by State	June 2004 CERR Submittal
33	New Hampshire	June 2004 CERR Submittal	2002 Preliminary NEI	June 2004 CERR Submittal
34	New Jersey	June 2004 CERR Submittal	June 2004 CERR Submittal	June 2004 CERR Submittal
36	New York	2002 Preliminary NEI	State supplied in Oct 2004	2002 Preliminary NEI
42	Pennsylvania	State supplied to Pechan in June 2004	State supplied to Pechan in June 2004	State supplied to Pechan in June 2004; State supplied revisions in Aug 2005
44	Rhode Island	State-supplied for June 2004 CERR Submittal, with revisions as directed by State	State-supplied for June 2004 CERR Submittal, with revisions as directed by State	State-supplied in Oct 2004
50	Vermont	2002 Preliminary NEI	Not supplied by State and not available from NEI	Not supplied by State and not available from NEI

b. NONROAD Model Categories

NONROAD model categories include equipment such as recreational marine and land-based vehicles, farm and construction machinery, and lawn and garden equipment. Aircraft ground support equipment (GSE) and rail maintenance equipment are also included in NONROAD. These equipment are powered by diesel, gasoline, compressed natural gas (CNG) and LPG engines.

EPA released a final version of NONROAD during December 2005 called NONROAD2005 (EPA, 2005a). To reflect the updates made to EPA's final NONROAD model, all MANE-VU Version 2 NONROAD model estimates were replaced with updated NONROAD2005 emission estimates.

EPA also released an updated version of its NMIM, which incorporates the final NONROAD2005 model. EPA's NMIM2005 is a consolidated modeling system that incorporates the NONROAD and MOBILE models, along with a county database of inputs (EPA, 2005b). The NMIM county database contains monthly input data to reflect county-specific fuel parameters and temperatures. Because incorporating revised monthly inputs for use in NMIM2005 is more efficient than preparing county-specific monthly option files needed to run NONROAD2005 independently, Pechan used NMIM2005 for most MANE-VU States. The two exceptions were for the District of Columbia and Maine due to the differences in oxygenated fuel inputs used for NMIM versus NONROAD.

As a first step, Pechan compiled fuel input data available from NMIM2005 by county and by month for all MANE-VU states for 2002. Pechan developed a spreadsheet that summarized the gasoline RVP, gasoline weight percent oxygen, and gasoline and diesel sulfur content proposed as inputs to the updated runs. Values consistent with State-supplied MOBILE6 inputs used for the development of 2002 MANE-VU highway vehicle inventories were presented for use where they differed from NMIM. Pechan requested that States confirm the use of these data for the NONROAD model runs, or provide alternative inputs.

The final county, monthly NMIM inputs provided or confirmed by the States for RVP, weight percent oxygen, and gasoline sulfur are presented in Appendix C, Table C-1. Pechan used NMIM's 2002 default value for nonroad diesel sulfur content. This value is 2,457 parts per million (ppm) for land-based equipment, and 2,767 ppm for recreational marine, for all MANE-VU counties.

Pechan also requested that States provide any local activity data in the format of updated NONROAD external data files. These include data files which specify activity parameters such as equipment populations, equipment annual hours of use, county allocation factors, and monthly allocation profiles.

Pechan updated the NMIM county database for 2002 to add in new gasoline profiles to reflect the monthly and county fuel input values provided by States. Pechan also updated the NMIM county database to cross reference the State-supplied NONROAD data files that replaced default

NONROAD2005 inputs. Pechan then ran NMIM/NONROAD2005 at the county and monthly level for 2002 and generated the results in NIF 3.0.

c. NONROAD2005 Model Runs

The majority of the model runs were performed using NMIM2005. NMIM and NONROAD have differences in the required format of the oxygenated fuel inputs. For NONROAD, this variable is required to be expressed as a composite weight percent oxygen that accounts for the market share and the percent oxygen of all contributing oxygenates. Since NMIM models HAP emissions, the volume percent and market share of each of four oxygenates must be entered as fuel inputs. These oxygenates include methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE), ethanol (ETOH), and tertiary amyl methyl ether (TAME). In cases where only one known oxygenate is present, this is straightforward to reflect in NMIM, as weight percent can be easily converted to volume percent. However, two States (the District of Columbia and Maine) provided a composite weight percent value for more than one oxygenate, but could not provide the corresponding volume percent and market share for each oxygenate to use in NMIM. As such, Pechan used NONROAD2005 for both the District of Columbia and Maine so that their submitted values for weight percent oxygen could be used directly. The 2002 minimum, maximum, and average hourly temperatures included in NMIM2005 were used to calculate average monthly temperature inputs to NONROAD for both States.

Pechan developed monthly NONROAD option files and ran these files through NONROAD2005 to generate monthly emissions that were then summed to develop an annual 2002 inventory. Pechan performed additional calculations using NMIM emission factors and fuel consumption to calculate NH_3, since NONROAD does not calculate NH_3 emissions.

2. What Quality Assurance Steps Were Performed?

The final MANE-VU nonroad inventory was comprised of emission estimates that were either: 1) submitted by States for the June 2004 CERR submittal or as additional revisions after this date; 2) developed using NONROAD model inputs provided or approved by States; or 3) reported by EPA in the preliminary 2002 NEI. As such, the QA steps were tailored to each of these types of submittals. Note that a Quality Assurance Plan was prepared prior to initiating work on Version 1 (MANE-VU, 2003). This plan was applied during development of all three versions of the MANE-VU inventory.

a. Summary of QA checks for State emission submittals

Nonroad emission submittals were accepted as part of the June 2004 CERR submittals to EPA or as direct submittals to MANE-VU. Upon receipt of an emissions submittal, Pechan prepared spreadsheets providing a unique list of errors identified by running the EPA NIF 3.0 QA software tool on the nonroad source inventory (EPA, 2004a). Notes were provided to identify the NIF 3.0 tables in which the errors appeared, as well as clarification as to where an error occurred (e.g., for what SCC and pollutant). For many of the errors, Pechan provided a potential correction, and States indicated whether they agreed with the correction, or provided their own instructions for correcting the error. These spreadsheets served to document each state's direction on how to correct errors and the state's representative authorizing the correction.

The list of general QA checks include the following:

- Duplicate records (i.e., only one record allowed for each unique county/SCC/ pollutant)
- Invalid record type
- Mandatory field is not populated
- Invalid field length
- Invalid data type (e.g., invalid SCCs or pollutants)
- "Out-of-range" emission values
- Referential integrity (i.e., the presence of widow or orphan records in the NIF 3.0 relational tables)

Note that EPA's NIF 3.0 QA software tool also checks for other specific QA issues by field not listed above. See EPA's User Guide, Appendix A for a listing of all potential errors that are checked by the program, and EPA's guidance for how they should be resolved.

Pechan also performed other general QA procedures outside of EPA's NIF 3.0 QA software tool, including pollutant augmentation, SCC reconciliation, and completeness and reasonableness checks.

Pechan performed pollutant augmentation in cases where the complete set of CAPs and NH_3 were not provided by a State. For example, several States did not provide PM25-PRI, but did provide PM10-PRI, so that PM25-PRI was estimated using EPA-published particle-size multipliers. Where multipliers were not available from EPA documentation, Pechan used available pollutant emission estimates reported by all other MANE-VU States to develop "emission ratios" for a given SCC. These "emission ratios" were then used to multiply available pollutant estimates to estimate values for the missing pollutants. Specific values used for a given State and SCC are cited in the "State-Specific Methods" section below.

In addition, SCC assignments were reviewed and reassigned after clarification from States as to what the specific SCC estimate represented. For example, a State may have reported all aircraft activity under one of the specific aircraft type SCCs (e.g., commercial or general aviation), when it should more accurately be reported under the general SCC 2275000000 (All Aircraft Types and Operations).

Finally, completeness checks were performed on the inventory to determine that emissions for nonroad categories known to operate in a State or county were being reported. Note that emissions may not be reported for all NONROAD SCCs for all counties in the MANE-VU RPO, and will depend on the geographic allocation methods used by the model, or specific allocation data provided by a State.

NONROAD model category estimates originally provided by States for the June 2004 submittal were replaced by emission estimates developed using NMIM/NONROAD 2005. As such, this

TSD will not document corrections made by Pechan to these original NONROAD model estimates, since they were replaced for Version 3.

b. Data input summary spreadsheets for State review

As mentioned above for NONROAD model categories, Pechan prepared the MANE-VU emission estimates using EPA's final NMIM/NONROAD2005 model. An important QA step in running NONROAD is to ensure that the inputs used for fuel specifications and temperatures for a given county and month in 2002 are representative. As such, Pechan compiled the RVP, percent oxygen, and gasoline sulfur inputs reported by NMIM2005 by county and month for States to review. If a State had previously submitted input data for the MANE-VU onroad inventory, these data were proposed in lieu of NMIM data. States either confirmed use of the default NMIM/onroad MANE-VU inputs, or provided alternate data in the specified format to replace the proposed inputs. Pechan updated the *gasoline* table in the NMIM county database to add in new gasoline profiles to reflect revised fuel input values provided by States. These profiles were then cross-referenced to the appropriate county and month in a separate table called *countyyearmonth*. Pechan performed QA checks of these NMIM county database tables for each State to ensure that the correct fuel data were input by county and by month as requested by the State.

c. QA of final mass emissions

After performing QA of the inputs, Pechan ran NMIM/NONROAD2005 at the county and monthly level for 2002 and generated the results in NIF 3.0. As a QA step, Pechan ran EPA's NIF 3.0 QA software tool on the NIF 3.0 files. Errors identified were resolved and checked to ensure they were corrected in the final files.

As part of final processing of the inventories, and to assist in tracking revisions and preparing emission summaries, Pechan added the following NIF plus fields to each table:

TblCE : State FIPS, County FIPS, Data Source, Revision Date
TblEM : State FIPS, County FIPS, Data Source, Revision Date, CAP/HAP, Year, Emission Ton Value, Emission Type Period
TblEP : State FIPS, County FIPS, Data Source, Revision Date
TblPE : State FIPS, County FIPS, Data Source, Revision Date
TblTR : State FIPS, County FIPS, Revision Date

Data source codes are included to document the origin of the emissions data, which assists in tracking and quality-assuring revisions made to the emission estimates. Table IV-3 provides a listing of the data source codes included in the MANE-VU nonroad inventories, as well as a definition of each code. State FIPS and County FIPS are separated out to assist in developing area-specific emission summaries, and the Emission Ton Value places all emissions on the same basis. The Emission Type Period describes the temporal basis of the estimates (in this case, they are all annual). Finally, the Revision Date tracks when record-specific changes are made.

Table IV-3. Data Source Code Descriptions

Data Source Code	Description
E-02-F	E = EPA-generated data; -02 = year 2002; -F = emissions are carried forward for inclusion in the 2002 base year
E-02-X	E = EPA-generated data; -02 = year 2002; -F = emissions are not grown or carried forward
P-02-X	P = RPO-generated data; -02 = year 2002; -X = emissions are not grown or carried forward
S-02-X	S = State data; -02 = year 2002 data; -X = emissions are not grown or carried forward

3. Version 3 Emission Summaries

Table IV-4 presents a summary of the annual 2002 nonroad sector pollutant emissions for each MANE-VU State, as well as a regional total. These emissions include SCCs for all NONROAD model engines, as well as aircraft, commercial marine vessel, and locomotive categories, where applicable, for each State. Table IV-5 presents the emission results for NONROAD model equipment only, while Table IV-6 provides emission estimates for aircraft, commercial marine vessel, and locomotive categories separately.

Table IV-4. Annual 2002 Nonroad Sector Emissions by MANE-VU State (Tons/Year)

State	CO	NH_3	NO_x	PM10-PRI	PM25-PRI	SO_2	VOC
Connecticut	276,773.0	16.6	25,460.2	1,952.1	1,793.9	2,087.4	33,880.2
Delaware	68,782.0	5.2	16,226.5	1,021.4	925.6	3,983.3	8,010.1
District of Columbia	18,844.7	2.4	3,571.3	310.2	298.7	375.4	2,072.5
Maine	153,423.6	11.4	9,820.4	1,436.8	1,329.4	916.8	31,144.1
Maryland	437,400.3	28.2	37,472.2	4,936.0	4,357.1	7,941.6	56,330.4
Massachusetts	461,514.3	28.2	42,768.5	3,531.2	3,226.4	3,791.2	56,748.5
New Hampshire	130,782.2	9.1	9,912.1	1,057.8	965.4	891.0	22,376.5
New Jersey	704,396.4	43.0	63,479.0	5,495.1	4,997.2	15,686.0	83,918.9
New York	1,233,968.3	79.3	109,878.3	9,605.3	8,820.9	12,919.7	157,611.7
Pennsylvania	931,978.0	55.0	103,824.2	9,737.9	8,440.1	7,915.0	102,331.0
Rhode Island	73,012.7	4.1	5,001.5	500.2	443.1	377.2	7,779.7
Vermont	62,248.1	4.5	4,217.1	529.9	485.8	372.1	10,547.6
Total MANE-VU	**4,553,123.5**	**286.9**	**431,631.3**	**40,113.9**	**36,083.6**	**57,256.6**	**572,751.3**

Table IV-5. Annual 2002 NONROAD2005 Model Emissions by MANE-VU State (Tons/Year)

State	CO	NH_3	NO_x	PM10-PRI	PM25-PRI	SO_2	VOC
Connecticut	274,387.6	16.6	17,897.0	1,712.9	1,577.6	1,376.6	33,519.0
Delaware	65,954.1	4.9	5,798.3	570.4	525.1	513.0	7,530.5
District of Columbia	18,774.9	2.4	3,066.4	298.4	287.8	341.3	2,052.9
Maine	148,555.3	11.4	8,228.9	1,204.2	1,135.1	771.8	30,741.0
Maryland	424,776.8	28.2	27,789.1	3,118.7	2,870.4	2,569.2	53,035.0
Massachusetts	448,398.7	28.2	30,046.7	2,887.2	2,658.8	2,428.1	54,835.8
New Hampshire	128,571.5	9.1	8,149.5	946.8	871.7	672.7	22,237.8
New Jersey	692,547.9	43.0	43,515.2	4,285.4	3,950.5	3,524.9	81,900.4
New York	1,219,308.7	79.3	78,648.3	8,338.9	7,677.1	6,966.3	155,475.1
Pennsylvania	903,167.7	55.0	62,265.2	6,281.5	5,784.3	5,292.4	99,240.9
Rhode Island	71,573.1	4.1	4,563.9	402.8	371.1	335.5	7,698.7
Vermont	61,732.1	4.5	4,169.9	517.6	476.6	367.6	10,520.4
Total MANE-VU	**4,457,748.6**	**286.6**	**294,138.2**	**30,564.8**	**28,186.1**	**25,159.4**	**558,787.4**

Table IV-6. Annual 2002 Aircraft, Commercial Marine, and Locomotive Emissions by MANE-VU State (Tons/Year)

State	CO	NH_3	NO_x	PM10-PRI	PM25-PRI	SO_2	VOC
Connecticut	2,385.4	0.0	7,563.2	239.2	216.4	710.8	361.2
Delaware	2,827.9	0.3	10,428.2	451.1	400.5	3,470.3	479.6
District of Columbia	69.7	0.0	505.0	11.8	10.9	34.1	19.7
Maine	4,868.3	0.0	1,591.5	232.6	194.3	145.0	403.1
Maryland	12,623.5	0.0	9,683.2	1,817.3	1,486.7	5,372.3	3,295.4
Massachusetts	13,115.6	0.0	12,721.7	644.0	567.6	1,363.1	1,912.7
New Hampshire	2,210.7	0.0	1,762.5	111.0	93.7	218.3	138.6
New Jersey	11,848.5	0.0	19,963.9	1,209.7	1,046.7	12,161.1	2,018.6
New York	14,659.6	0.0	31,230.0	1,266.4	1,143.8	5,953.4	2,136.6
Pennsylvania	28,810.2	0.0	41,559.0	3,456.4	2,655.8	2,622.7	3,090.2
Rhode Island	1,439.6	0.0	437.6	97.4	72.1	41.7	81.0
Vermont	516.0	0.0	47.3	12.2	9.2	4.5	27.2
Total MANE-VU	**95,374.9**	**0.3**	**137,493.1**	**9,549.1**	**7,897.4**	**32,097.3**	**13,963.9**

B. State-Specific Methods

The following sections describe the methods used and QA issues addressed for each MANE-VU State in developing Version 3.0 of MANE-VU's nonroad sector inventory.

1. Connecticut

a. What Data Sources Were Used?

Pechan ran EPA's NMIM2005 to generate NONROAD model SCC emission estimates. Pechan incorporated Connecticut-supplied data for gasoline sulfur content and RVP into the NMIM database. Pechan used NMIM defaults for diesel sulfur content and for weight percent oxygenate values. The final input data by county and by month are summarized in Table B-1.

Aircraft and commercial marine vessel emissions are based on the preliminary 2002 nonroad NEI. In March 2006, Connecticut provided county-level emission estimates for VOC, NO_x, and CO for all line-haul and switchyard locomotive SCCs.

b. What QA Issues were Identified and Addressed?

For commercial aircraft (SCC 2275020000), PM10-PRI and PM25-PRI were not reported in the EPA's NEI. For completeness, Pechan estimated PM10-PRI emissions by applying an average PM10-PRI/NO_x emission ratio of 0.058 to available NO_x emissions. Commercial aircraft PM25-PRI emissions were estimated by multiplying PM10-PRI emissions by a particle size multiplier of 0.976 (ERG, 2004).

c. What Issues Need to be Addressed in Future Versions?

Because EPA's NEI does not include locomotive category emission estimates for Connecticut, and since Connecticut only provided emission estimates for VOC, NO_x, and CO, estimates are still missing for PM10-PRI, PM25-PRI, and SO_2.

2. Delaware

a. What Data Sources Were Used?

Pechan used NMIM2005 to generate NONROAD model SCC emission estimates. Delaware approved of the fuel inputs used in NMIM2005. The final fuel input data by county and by month are summarized in Table B-1. Delaware provided updated files listed in Table IV-7 to replace the default files used in NMIM. These included county allocation files for five nonroad categories, and a revised equipment population file with updated populations for specific SCCs.

Table IV-7. Delaware NONROAD External Data Files

County NR File Name	File Type
10000air.alo	County allocation for airport GSE
10000gc.alo	County allocation for golf carts
10000hou.alo	County allocation for lawn & garden
10000log.alo	County allocation for logging
10000rvp.alo	County allocation for land-based recreational
10000.pop	Equipment population

Pechan used Delaware's June 2004 CERR submittal as the basis for aircraft, locomotive and commercial marine vessel category estimates in the 2002 MANE-VU inventory.

i. What Revisions Were Requested by State?

In September 2004, Delaware provided corrections to the general aviation emissions (SCC 227505000) for all pollutants for Kent County to add in general aviation activity at Dover Air Force Base.

b. What QA Issues were Identified and Addressed?

Pechan performed QA of the file, and revised the file to address QA issues as approved by Delaware. Commercial aircraft (SCC 2275020000) included emission estimates for all pollutants except PM25-PRI. Pechan calculated commercial aircraft PM25-PRI emissions using the assumption that 97.6% of PM10-PRI is PM25-PRI (ERG, 2004).

c. What Issues Need to be Addressed in Future Versions?

None identified by the State.

3. District of Columbia

a. What Data Sources Were Used?

Pechan developed NONROAD Model SCC emissions for District of Columbia using NONROAD2005. NONROAD2005 was used directly instead of NMIM2005 to incorporate State-supplied weight percent oxygen data. The District of Columbia also requested changes to the default NMIM RVP and gasoline values for some months. The final fuel input data by county and by month are summarized in Table B-1.

The 2002 minimum, maximum, and average hourly temperatures included in NMIM were used to calculate average monthly temperature inputs to NONROAD. Pechan developed monthly NONROAD2005 option files for the District of Columbia. Pechan ran the option files through NONROAD2005 to generate monthly emissions that were then summed to develop an annual 2002 inventory. Pechan performed additional calculations using NMIM emission factors and NONROAD2005 fuel consumption to calculate NH_3, since NONROAD does not calculate NH_3 emissions. NMIM reports NH_3 emission factors of 116 grams NH_3 per gallon gasoline for gasoline engines, and 83 grams NH_3 per gallon fuel for diesel engines.

The District of Columbia provided locomotive emissions for their nonroad sector June 2004 CERR submittal.

b. What QA Issues were Identified and Addressed?

Pechan performed QA of the file, and revised the file to address QA issues as approved by the District of Columbia. PM emissions in the inventory were not identified as either PM_{10} or $PM_{2.5}$, nor were the emissions identified as primary or filterable. The District of Columbia authorized Pechan to change PM to PM10-PRI. Locomotive PM25-PRI emissions were estimated using the assumption that 90 percent of PM_{10} is $PM_{2.5}$ (EPA, 2003b). Hydrocarbon (HC) pollutant emissions were also removed from the inventory, as this is not a valid pollutant code in NIF3.0.

Pechan added commercial marine vessel emissions from the preliminary 2002 Nonroad NEI. There are no aircraft emission estimates in the NEI for the District of Columbia, since there are not airports located in the District of Columbia.

c. What Issues Need to be Addressed in Future Versions?

None identified by the State.

4. Maine

a. What Data Sources Were Used?

Pechan developed NONROAD model SCC emissions using NONROAD2005. For Maine, weight percent oxygen values were submitted based on actual fuel survey results by county and by month, but Maine had not tracked the corresponding oxygenate volume percent and market share. As such, Pechan used NONROAD2005 so that Maine's values for weight percent oxygen could be reflected. Maine also provided revisions to the RVP and gasoline sulfur values reported in NMIM2005. Pechan developed NONROAD2005 monthly option files for two county groups in Maine that shared values for all three fuel inputs (see Appendix C, Table C-1). The 2002 minimum, maximum, and average hourly temperatures included in NMIM were used to calculate average monthly temperature inputs to NONROAD. Pechan ran the option files through NONROAD2005 to generate monthly emissions that were then summed to develop an annual 2002 inventory. Pechan performed additional calculations using NMIM emission factors and fuel consumption to calculate NH_3, since NONROAD does not calculate NH_3 emissions. NMIM reports NH_3 emission factors of 116 grams NH_3 per gallon gasoline for gasoline engines, and 83 grams NH_3 per gallon fuel for diesel engines.

i. What Revisions Were Requested by State?

In October 2004, Maine provided aircraft, commercial marine vessel, and locomotive SCC emissions to be added to their inventory. Commercial marine emissions submitted by Maine only represented in-port emissions. Diesel and residual commercial marine underway emissions (SCCs 2280002200 and 2280003200) were based on EPA's 2002 preliminary NEI.

b. What QA Issues were Identified and Addressed?

PM25-PRI estimates were missing from all aircraft SCC records provided by Maine. Pechan estimated general aviation, military aircraft, and air taxi PM25-PRI emissions by multiplying PM10-PRI emissions by a particle size multiplier of 0.69 (EPA, 2003b). Commercial aircraft PM25-PRI emissions were estimated by multiplying PM10-PRI emissions by a particle size multiplier of 0.976 (ERG, 2004). In-port commercial marine emissions (SCC 2280002100) were missing estimates for PM10-PRI and PM25-PRI. Pechan estimated PM10-PRI emissions by applying a PM10-PRI/NO_x emission ratio of 0.042 to available NO_x emissions. PM25-PRI emissions were estimated by multiplying PM10-PRI emissions by a particle size multiplier of 0.92 (EPA, 2003b).

c. What Issues Need to be Addressed in Future Versions?

None identified by the State.

5. Maryland

a. What Data Sources Were Used?

Pechan used NMIM2005 to prepare NONROAD model SCC emission estimates. Maryland reviewed the default NMIM inputs and provided revisions to the input values for RVP and weight percent oxygen for all months. Maryland requested that a value of 2.1 percent oxygen be used for all counties and months. This weight percent value was then converted to a volume percent of 11.8 percent for use in NMIM, assuming MTBE was the only oxygenate. In addition, gasoline sulfur content revisions were incorporated into NMIM for select counties for the months of April through September. The final fuel input data by county and by month are summarized in Table B-1.

Maryland also provided updated files listed in Table IV-8 to replace the default files used in NMIM. These included county allocation files for several nonroad categories.

Table IV-8. Maryland NONROAD External Data Files

County NR File Name	File Type
24000pop.alo	County allocation for several nonroad categories (population)
24000con.alo	County allocation for construction
24000hou.alo	County allocation for lawn & garden

Pechan used Maryland's nonroad sector CERR submittal as the basis for the MANE-VU inventory for the aircraft, locomotive and commercial marine vessel categories.

i. What Revisions Were Requested by State?

In September 2004, Maryland provided revised aircraft and commercial marine vessel emission estimates. Pechan replaced the aircraft and commercial marine vessel emissions from their CERR submittal with the revised emissions.

b. What QA Issues were Identified and Addressed?

Pechan performed QA of the file, and revised the file to address QA issues as approved by Maryland. Maryland did not provide PM25-PRI aircraft emissions in their inventory. Pechan estimated general aviation, military aircraft, and air taxi PM25-PRI emissions by multiplying PM10-PRI emissions by a particle size multiplier of 0.69 (EPA, 2003b). Commercial aircraft PM25-PRI emissions were estimated by multiplying PM10-PRI emissions by a particle size multiplier of 0.976 (ERG, 2004).

c. What Issues Need to be Addressed in Future Versions?

None identified by the State.

6. Massachusetts

a. What Data Sources Were Used?

Pechan used NMIM2005 to generate NONROAD model SCC emission estimates. Massachusetts reviewed the NMIM inputs and approved of the fuel input values for RVP and gasoline sulfur content. NMIM2005 reported a weight percent oxygen of 2.1 percent for all months for all counties in Massachusetts, and the State requested a value of 1.5 percent be used for all counties from October through April. This weight percent value was then converted to a volume percent of 8.4 percent for use in NMIM, given that MTBE was the only oxygenate. Final fuel input data by county and by month are presented in Table B-1.

Massachusetts provided annual emissions for aircraft, locomotive and commercial marine vessel categories for their nonroad sector CERR submittal. These inventories included all CAP.

i. What Revisions Were Requested by State?

Massachusetts requested that Pechan incorporate revisions supplied for annual emissions for in-port diesel commercial marine (SCC 2280002010) for Dukes County (25007).

b. *What QA Issues were Identified and Addressed?*

Pechan changed the aircraft SCC "2275050000" to "2275000000," since Massachusetts verified that this emission record represents all aircraft types, not just general aviation.

c. *What Issues Need to be Addressed in Future Versions?*

None identified by the State.

7. New Hampshire

a. *What Data Sources Were Used?*

Pechan used NMIM2005 to generate NONROAD model SCC emission estimates. New Hampshire reviewed and approved of the fuel inputs used in NMIM2005. See Table B-1 for a summary of the final fuel input data by county and month.

Pechan used New Hampshire's nonroad sector CERR submittal as the basis for the MANE-VU aircraft and locomotive inventory. Pechan added commercial marine vessel emissions from the preliminary 2002 Nonroad NEI.

b. *What QA Issues were Identified and Addressed?*

Pechan performed QA of the file, and revised the file to address QA issues as approved by New Hampshire. New Hampshire did not provide PM_{10} and $PM_{2.5}$ aircraft emissions in their inventory. New Hampshire authorized Pechan to develop aircraft PM_{10} emissions for all aircraft types by applying an average PM10/NO_x emission ratio to the aircraft NO_x emissions in their inventory. The PM_{10}/NO_x ratios used were 3.819 for military and air taxi, 3.642 for general aviation, and 0.058 for commercial aircraft. Pechan estimated general aviation, military aircraft, and air taxi PM25-PRI emissions by multiplying PM10-PRI emissions by a particle size multiplier of 0.69 (EPA, 2003b). For commercial aircraft, Pechan estimated PM25-PRI emissions using the assumption that 97.6% of PM_{10} is $PM_{2.5}$ (ERG, 2004).

c. *What Issues Need to be Addressed in Future Versions?*

None identified by the State.

8. New Jersey

a. *What Data Sources Were Used?*

Pechan used NMIM2005 to generate NONROAD model SCC emission estimates. New Jersey approved of the default fuel inputs used in NMIM2005. See Table B-1 for a summary of the final fuel input data by county and month. New Jersey provided an updated data input file containing revised equipment populations (34000.pop) for specific SCCs for the NMIM model runs.

Pechan used New Jersey's nonroad sector CERR submittal as the basis for the aircraft, locomotive and commercial marine vessel categories. These inventories included all CAPs.

b. *What QA Issues were Identified and Addressed?*

Pechan performed QA of the file, and revised the file to address QA issues as approved by New Jersey. The only QA issue identified was the inclusion of carbon dioxide (CO_2) in the inventory, which is not a valid pollutant code in NIF3.0, so these records were removed.

c. *What Issues Need to be Addressed in Future Versions?*

None identified by the State.

9. New York

a. *What Data Sources Were Used?*

Pechan used NMIM2005 to generate NONROAD model SCC emission estimates. New York reviewed the default NMIM inputs and provided revisions to the input values for RVP and gasoline sulfur for all months. New York also requested revisions to weight percent oxygen values for all counties and months. These weight percent values were then converted to a volume percent for use in NMIM, based on MTBE as the only oxygenate for all counties, with the exception of four counties. These included Cattaraugus, Chautauqua, Erie, and Niagara counties, which use ETOH as the oxygenate. The final fuel input data by county and by month are summarized in Table B-1.

For the aircraft and locomotive categories, Pechan used emissions reported in the preliminary 2002 Nonroad NEI.

i. *What Revisions Were Requested by State?*

In October 2004, New York provided commercial marine vessel emissions to be added to their inventory. New York did not provide PM-2.5 commercial marine vessel emissions for some counties in their inventory. Pechan estimated the commercial marine vessel PM25-PRI emissions from PM10-PRI using the assumption that 92% of PM_{10} is $PM_{2.5}$ (EPA, 2003b).

b. What QA Issues were Identified and Addressed?

Commercial aircraft (SCC 2275020000) emissions for PM10-PRI and PM25-PRI were not reported in the EPA's preliminary 2002 NEI. Pechan estimated PM10-PRI emissions by applying a PM10-PRI/NO_x emission ratio of 0.058 to available NO_x emissions for this SCC. Commercial aircraft PM25-PRI emissions were estimated by multiplying PM10-PRI emissions by a particle size multiplier of 0.976 (ERG, 2004).

c. What Issues Need to be Addressed in Future Versions?

None identified by the State.

10. Pennsylvania

a. What Data Sources Were Used?

Pechan used NMIM2005 to generate NONROAD model SCC emission estimates. Pennsylvania approved of the fuel inputs provided, which were based on the onroad MOBILE6 inputs. Since these differed from the values in NMIM2005, Pechan updated the NMIM profiles accordingly. See Table B-1 for a summary of the final fuel input data by county and month. Pennsylvania provided one county allocation file for the lawn and garden category (42000hou.alo) to replace the default file used in NMIM.

Pennsylvania submitted an aircraft, locomotive, and commercial marine vessel emissions inventory to MANE-VU after the CERR submittal date.

i. What Revisions Were Requested by State?

In August 2005, Pennsylvania provided Pechan with county-level updates to SCC 2285002006 (Line Haul Locomotives: Class I Operations) emissions for all pollutants. Pechan updated all emission records for this SCC in Pennsylvania's inventory.

b. What QA Issues were Identified and Addressed?

Pennsylvania authorized Pechan to remove the CO_2 emission records from their inventory. In addition, the following data augmentation was performed to add missing SCCs and pollutants. Pennsylvania did not provide commercial aircraft emissions in their inventory. Pechan added commercial aircraft emissions from the 2002 preliminary NEI to Pennsylvania's inventory. Pennsylvania did not provide PM10-PRI and PM25-PRI aircraft emissions in their inventory. Pechan developed aircraft PM_{10} emissions for all aircraft types by applying an average PM_{10}/ NO_x emission ratio to Pennsylvania's available aircraft NO_x emissions. The PM_{10}/NO_x ratios used were 3.819 for military and air taxi, 3.642 for general aviation, and 0.058 for commercial aircraft. Pechan estimated general aviation, military aircraft, and air taxi PM25-PRI emissions by multiplying PM10-PRI emissions by a particle size multiplier of 0.69 (EPA, 2003b). For commercial aircraft, Pechan estimated PM25-PRI emissions using the assumption that 97.6% of PM_{10} is $PM_{2.5}$ (ERG, 2004).

Pennsylvania also did not provide SO_2 general aviation and air taxi emissions in the inventory. Pechan estimated the SO_2 emissions by applying a SO_2/NO_x emission ratio to the general aviation and air taxi NO_x emissions, using ratios of 0.154 and 0.095, respectively.

c. What Issues Need to be Addressed in Future Versions?

None identified by the State.

11. Rhode Island

a. What Data Sources Were Used?

Pechan used NMIM2005 to generate NONROAD model SCC emission estimates. Rhode Island approved of the fuel inputs used in NMIM2005. See Table B-1 for a summary of the final fuel input data by county and month. Rhode Island provided a revised equipment population file (44000.pop) with updated populations for specific SCCs to replace the default file used in NMIM.

Rhode Island provided emissions for aircraft, locomotive and commercial marine vessel categories for their nonroad sector CERR submittal.

i. What Revisions Were Requested by State?

Rhode Island provided updates in September 2004 to their county-level railroad equipment emissions. The new emissions fall under SCC 2285002005 and replace all line haul locomotive emissions provided in their CERR submittal. Emission estimates for yard locomotives were also provided (SCC 2285002010).

b. What QA Issues were Identified and Addressed?

Pechan performed QA of the file, and revised the file to address QA issues as approved by Rhode Island.

PM_{10} was not identified as either primary or filterable. Rhode Island authorized Pechan to change it to PM10-PRI. To avoid double counting, Pechan removed the following SCCs from Rhode Island's inventory: 2275000000, 2280002000, 2280002020, 2280003000, and 2280003020. These emissions are accounted for under more specific SCCs for aircraft, and more aggregate SCCs for commercial marine.

Rhode Island did not provide PM10-PRI and PM25-PRI aircraft emissions in their inventory. Pechan developed aircraft PM_{10} emissions for all aircraft types by applying an average PM_{10}/NO_x emission ratio to the aircraft NO_x emissions in their inventory. The PM_{10}/NO_x ratios used were 3.819 for military and air taxi, 3.642 for general aviation, and 0.058 for commercial aircraft. Pechan estimated general aviation, military aircraft, and air taxi PM25-PRI emissions by multiplying PM10-PRI emissions by a particle size multiplier of 0.69 (EPA, 2003b). For commercial aircraft, Pechan estimated PM25-PRI emissions using the assumption that 97.6% of PM_{10} is $PM_{2.5}$ (ERG, 2004).

Rhode Island did not provide yard locomotive, and commercial marine vessel PM25-PRI emissions in their inventory. Pechan estimated the yard locomotive PM25-PRI emissions from PM10-PRI using the assumption that 90% of PM_{10} is PM25 (EPA, 2003b). Pechan estimated the commercial marine vessel PM25-PRI emissions from PM10-PRI using the assumption that 92% of PM_{10} is $PM_{2.5}$ (EPA, 2003b).

c. *What Issues Need to be Addressed in Future Versions?*

None identified by the State.

12. Vermont

a. *What Data Sources Were Used?*

Pechan developed NONROAD model SCC emissions for Vermont using NMIM2005. Vermont approved of the default fuel input values used in NMIM2005 for weight percent oxygen, but requested that the RVP and gasoline sulfur values reflect values used for onroad mobile source emissions.

Pechan added aircraft emissions for Vermont from the preliminary 2002 Nonroad NEI.

b. *What QA Issues were Identified and Addressed?*

Commercial aircraft (SCC 2275020000) emissions for PM10-PRI and PM25-PRI were not reported in the EPA's preliminary 2002 NEI. Pechan estimated PM10-PRI emissions by applying an average PM10-PRI/NO_x emission ratio of 0.058 to available NO_x emissions. Commercial aircraft PM25-PRI emissions were estimated by multiplying PM10-PRI emissions by a particle size multiplier of 0.976 (ERG, 2004).

c. *What Issues Need to be Addressed in Future Versions?*

Note that there are no locomotive or commercial marine vessel emissions in the NEI for Vermont. Where activity for any of these SCCs occurs in Vermont, these categories are not represented in the State's inventory.

CHAPTER V – ONROAD SOURCES

A. General Methods for All States

This section provides an overview of the data sources and QA steps used in preparing the 2002 onroad sector inventory for the MANE-VU States and in preparing the corresponding modeling inputs for the MANE-VU Version 3 modeling inventory. The onroad sector is comprised of all motorized vehicles that travel on the public highways including passenger cars, light-duty trucks, minivans, sport utility vehicles, heavy-duty trucks, and buses. It should be noted that, unlike the other emission sectors, the modeling inventory inputs for the onroad sector do not include any emissions data. The primary modeling inputs for the onroad sector instead are the activity inputs (vehicle miles traveled (VMT)) and SMOKE-formatted MOBILE6 input files. The SMOKE model then generates full MOBILE6 input files using the MOBILE6 inputs, speed inputs, and meteorological inputs for the episode(s) to be modeled, runs the MOBILE6 emission factor model to calculate the appropriate emission factors, and calculates emissions using the supplied VMT and additional temporal allocation factors for the VMT.

1. Data Sources

a. Source of default model data

The MANE-VU 2002 onroad emissions inventory was compiled from data supplied by the MANE-VU State agencies in the form of onroad emissions input data or emissions inventories either directly to MANE-VU or to EPA through their CERR submittal. States provided information in one or more of the following ways: (1) an onroad emission inventory submittal to EPA, (2) MOBILE6 inputs and VMT data in NMIM format to EPA, (3) portions of MOBILE6 inputs or full MOBILE6 input files and supporting files plus VMT to EPA, or (4) portions of MOBILE6 inputs or full MOBILE6 input files and supporting files plus VMT to MANE-VU. Different procedures were followed in developing the MANE-VU 2002 onroad emission inventory depending upon how the data were submitted.

As discussed above, the primary data needed in preparing the inputs for the onroad modeling files were the VMT data and MOBILE6 input files. All of the MANE-VU States provided VMT data, which were incorporated in the SMOKE modeling. The level of detail of the supplied VMT data and any additional processing of the VMT data are discussed individually by State, below, in Section B: State-Specific Methods. Therefore, no default data were needed for the VMT inputs. Default model inputs for the SMOKE MOBILE6 input files were needed in some cases. The source of default information to be included in these input files was the NMIM national county database, as this was also the default source of data for EPA in preparing the 2002 NEI. This database includes information on monthly fuel data by county, control program information by county, such as inspection and maintenance (I/M) program inputs, and other fleet information, such as vehicle registration distributions, that may have been supplied by the States. Additionally, vehicle speed information is needed in the SMOKE modeling files. Some States supplied this information. In cases where no speed data were supplied, the default speeds used by EPA in calculating the NEI were used. These speeds differ by road class group and by vehicle class group.

For the SMOKE modeling, Pechan did not provide any ambient data such as temperature or humidity. Instead, the SMOKE model needs meteorological input data specific to the episode(s) being modeled. Thus, although the SMOKE MOBILE6 input files do include temperature data and in some cases humidity data, these inputs will be replaced by the SMOKE model with the appropriate episode-specific data.

b. Model inputs and revisions provided by States

The model inputs and revisions provided by the States are discussed in detail in Section B, below. These inputs include VMT data, VMT temporal data, vehicle speeds, I/M program inputs, registrations distributions, and other MOBILE6 input data.

c. Model inputs provided vs. model inputs used

Pechan prepared the following model input files for Version 3 of the MANE-VU modeling inventory:

- MANEVU_2002_mbinv_02022006.txt—contains VMT and speeds by county and SCC;
- MANEVU_2002_mtpro_02022006.txt—contains VMT temporal profiles;
- MANEVU_2002_mtref_02022006.txt—contains cross references between temporal profiles and county/SCC;
- MANEVU_2002_vmtmix_02022006.txt—contains VMT vehicle mix fractions;
- MANEVU_2002_mcref_02022006.txt—contains cross reference between MANE-VU counties and the SMOKE MOBILE6 input files;
- MANEVU_2002_mvref_02022006.txt—contains general county-level information for SMOKE;
- MANEVU_2002_spdpro.txt—contains hourly speed profiles (SPDPRO);
- MANEVU_2002_spdref.txt—contains cross references between speed profiles and MANE-VU county/SCC;
- MANEVU_2002_mcodes.txt—contains information on SCCs used in MBINV file;
- MANEVU_SMOKE_M6Inputs_MA_NJ_02022006.zip—contains monthly SMOKE-formatted MOBILE6 input files for Massachusetts and New Jersey, updated for Version 3;
- MANEVU_2002_SMOKE_M6_InputFiles032004.zip—contains monthly SMOKE-formatted MOBILE6 input files for all MANE-VU States. Files for Massachusetts and New Jersey from this zip file should be replaced by the Version 3 files dated 02/02/2006.
- MANEVU_2002_SMOKE_M6_ExternalFiles.zip—contains external data files called by the SMOKE MOBILE6 input files.

2. What Quality Assurance Steps were Performed?

This section provides a brief summary of the QA steps and processes that were performed in the development of the onroad sector modeling inputs for MANE-VU. The initial QA procedures were performed on the emissions and input data used to calculate the MANE-VU 2002 onroad emission inventory. Some of these QA procedures are also relevant here to the modeling inventory as many of the inputs are either the same or start with common information.

For States submitting onroad emission inventories to EPA, Pechan performed QA checks on the State-provided emission inventory data to ensure completeness, referential integrity, and correct formatting of the data. Where necessary as a result of these QA checks, and with the approval of the affected State, Pechan revised the inventories to meet the necessary inventory standards. For the modeling inventory, the VMT checks included in these QA checks are relevant. Note that a Quality Assurance Plan was prepared prior to initiating work on Version 1 (MANE-VU, 2003). This plan was applied during development of all three versions of the MANE-VU inventory.

a. Data input summary spreadsheets for State review

In reviewing the data submitted for both the annual onroad inventory and the onroad modeling files, Pechan prepared a State QA report for each State. These reports were in the form of Excel spreadsheets. In each of the State QA reports, a page was included that summarized the modeling inputs. This included MOBILE6 input parameters, such as I/M data, registration data, and fuel data. Columns were included indicating the data file name, data coverage (e.g., statewide or for specific counties), data source, any comments regarding the data, an indication of whether any guidance was requested from the State agency before proceeding, and columns for State agency approval of the listed inputs. These reports were provided to each State agency and the State could either approve the inputs summarized or provide an alternate data source or calculation method. For States that had submitted emission inventories in NIF format, results of the NIF QA checks were also included in these State QA reports for the states to review and approve and provide alternate data or methods. This table also include information on the VMT data source and any proposed methodologies needed for processing the VMT.

b. Responses from State Agencies

The appropriate State agency staff reviewed the State QA reports and provided direction for correcting QA issues either in the QA Summary Report Excel file or via e-mail. The modeling inputs were then revised to incorporate responses from the agencies.

3. Version 3 Emission Summaries

Table V-1 presents a summary of the annual 2002 Version 3 MANE-VU onroad sector pollutant emissions for each MANE-VU State, as well as a regional total. Differences between these Version 3 annual emission totals and the Version 2 totals documented in the January 2005 MANE-VU mobile sources inventory report are the result of updated data provided by New Jersey and Massachusetts. Emissions for the remaining states have not changed. It should be noted that these emission results are from the annual inventory modeling. These will differ from the results obtained by the SMOKE onroad modeling. Additionally, the emissions in this table do not reflect VMT updates from Vermont that were provided after the Version 2 MANE-VU annual inventory had been calculated, but were included in the SMOKE Version 2 and Version 3 modeling inputs.

Table V-1. Annual 2002 Onroad Sector Emissions by MANE-VU State (Tons/Year)

State	VOC	NO_x	CO	SO_2	PM10-PRI	PM25-PRI	NH_3
Connecticut	31,755.3	68,816.2	562,124.0	1,666.9	1,580.0	1,041.6	3,293.9
Delaware	10,563.8	21,340.5	160,760.4	583.9	581.1	414.9	902.8
District of Columbia	4,895.3	8,902.0	66,017.6	271.1	222.0	153.0	397.8
Maine	23,037.4	54,686.8	410,957.8	1,803.9	1,239.1	934.4	1,467.5
Maryland	61,846.7	122,210.0	1,000,762.8	4,057.6	3,168.3	2,200.4	5,594.3
Massachusetts	57,185.5	143,367.6	1,039,100.1	4,398.8	3,407.5	2,409.9	5,499.1
New Hampshire	16,762.3	33,283.0	306,792.5	776.9	814.3	561.8	1,447.0
New Jersey	89,752.9	152,076.1	1,273,513.1	3,648.6	3,725.3	2,469.0	7,382.0
New York	287,845.2	319,732.5	3,711,149.6	10,639.5	8,457.5	5,897.7	14,680.9
Pennsylvania	176,090.3	346,471.5	2,784,196.5	10,924.1	7,351.5	5,331.2	10,532.3
Rhode Island	12,537.8	16,677.2	186,196.8	425.3	345.1	210.5	852.6
Vermont	17,287.8	20,669.9	248,247.6	893.8	669.6	482.8	934.1
Total MANE-VU	**789,560.3**	**1,308,233.3**	**11,749,818.8**	**40,090.5**	**31,561.3**	**22,107.2**	**52,984.3**

B. State-Specific Methods

The following sections describe what modeling inputs were used for each State and how these inputs were developed.

1. Connecticut

a. What Data Sources Were Used?

Table V-2 summarizes the onroad SMOKE input files that were prepared containing information for the State of Connecticut. This table notes the level of detail of the data included as well as the source of the original information used to create these data files.

The VMT inputs provided by Connecticut were in the form of three sets of data. This included a file with VMT by county and four road types (Expressway, Arterial/Collector, Local, and Ramp), a set of Statewide VMT mixes at the 16 vehicle type-level for each of the four Connecticut road types, and a Statewide hourly VMT distribution file. Additional data provided by Connecticut showing the correspondence between the four Connecticut road types and the 12 Highway Performance Monitoring System (HPMS) road types were used to first distribute the county VMT to the 12 road types. Average daily miles were converted to annual miles by multiplying the average daily miles by 365. Pechan then developed a simple MOBILE6 input file that used the Connecticut registration distribution and with a separate scenario for each of the VMT mixes provided at the 16 vehicle type level. Pechan used the resulting MOBILE6 output file to extract the 28 vehicle type VMT mix corresponding to each of the four Connecticut road types. The VMT data by county and 12 road types were then multiplied by the 28 vehicle type VMT fractions to obtain a VMT file at the 28 vehicle type level and 12 road type level by county (for use in calculating the annual emission inventory). VMT from these 28 vehicle types were then aggregated to the 12 vehicle types needed for the SMOKE MBINV input file. The VMT mix fractions by vehicle type for each county and road type were also calculated for inclusion in the SMOKE VMTMIX file.

Table V-2. Connecticut Onroad Data in SMOKE Input Files

	Final MANE-VU Version 3 SMOKE Input File	Level of Detail	Data Source
VMT	MANEVU_2002_mbinv_02022006.txt	County/SCC	CT
Speeds	MANEVU_2002_mbinv_02022006.txt	Road type/3 vehicle groups	Default NEI
Speed profiles	MANEVU_2002_spdpro.txt and MANEVU_2002_spdref.txt	County/hour/road type	CT
VMT mix	MANEVU_2002_vmtmix_02022006.txt	Statewide/road type	CT
SMOKE MOBILE6 file listing	MANEVU_2002_mcref_02022006.txt	County	
SMOKE MOBILE6 file listing	MANEVU_2002_mvref_02022006.txt	County	

For Connecticut, speed information is contained in both the MBINV SMOKE file as well as in the SMOKE speed profile (SPDPRO) and speed cross reference file (SPDREF) files. The speed information contained in the MBINV file is simply the default NEI speed data. The actual speed data to be used in the modeling inventory for Connecticut are contained in the SMOKE SPDPRO and SPDREF. The speed data from these two files should overwrite the default speed information contained in the MBINV file during the SMOKE modeling. The data used to develop the speed profiles were provided by Connecticut in the form of NMIM speed input files with the fraction of VMT occurring within each of 14 speed bins. These speed distributions differ by hour of day and by freeways versus arterials and collectors. Separate speed distribution files were provided by Connecticut for each county. Pechan then converted these speed data into the speed profile format needed for SMOKE—hourly average speeds by county and the two specified road types.

Connecticut provided the following data that were incorporated into the monthly MOBILE6 input files for the SMOKE modeling:

- Statewide registration distribution;
- Hourly VMT distributions;
- Statewide I/M program inputs and Anaerobic Thermal Processor (ATP); and
- RVP and fuel program data.

The data submitted by Connecticut indicated that Federal Northern reformulated gasoline is in place in the State, with an ozone season RVP of 6.8 pounds per square inch (psi). Based on the NMIM modeling that was performed for the annual emission inventory, the reformulated gasoline program was modeled in the SMOKE MOBILE6 input files using the combination of the FUEL PROGRAM: 4 command (indicating user-supplied gasoline sulfur inputs), RVP command, and the OXYGENATED FUELS command. The monthly oxygenated fuel and gasoline sulfur inputs, and the non-ozone season monthly RVP values were obtained from the

NMIM national county database for Connecticut. During the ozone season months, the RVP value submitted by Connecticut of 6.8 psi was modeled. The fuel data obtained from NMIM are the same for all counties in Connecticut, except Fairfield, which shows different fuel properties, but all represent reformulated gasoline. These values for both Fairfield and the remaining counties differed by season (i.e., the ozone season from May through September, transition months of March, April, October, and November, and the winter months of December, January, and February). Statewide diesel sulfur values modeled from NMIM were 367 ppm sulfur in the summer months (June, July, and August), 340 ppm sulfur in the winter months (December, January, and February), and 353 ppm sulfur in the spring and fall months.

Data provided by Connecticut indicated that the State follows the OTC low emission vehicle (LEV) program vehicle implementation schedule. Therefore, the OTC-LEV program LEV implementation schedule was included in the MOBILE6 SMOKE input files, starting implementation in the 1999 model year followed by a full implementation of the National LEV program in the 2001 model year.

b. What QA Issues were Identified and Addressed?

No QA issues were identified for Connecticut.

c. What Issues Need to be Addressed in Future Versions?

None identified by the State.

2. Delaware

a. What Data Sources Were Used?

Table V-3 summarizes the onroad SMOKE input files that were prepared containing information for the State of Delaware. This table notes the level of detail of the data included as well as the source of the original information used to create these data files.

Delaware provided VMT data in the form of the NEI NIF PE table as well as in the NMIM BaseYearVMT table format. Additionally, Delaware provided monthly VMT fractions developed from VMT counts on a variety of road types. These monthly VMT fractions were provided for each of the Delaware counties. Since the data in the NEI NIF PE table were at the level of detail needed for the SMOKE MBINV file, the format of the VMT data was simply converted from the NIF format to the SMOKE MBINV format. Similarly, the monthly VMT fractions were converted to the profile format needed in the SMOKE MTPRO file, with the appropriate cross references in the MTREF file. The average speeds provided by Delaware at the county/road type level were included in the SMOKE MBINV file.

Table V-3. Delaware Onroad Data in SMOKE Input Files

	Final MANE-VU Version 3 SMOKE Input File	Level of Detail	Data Source
VMT	MANEVU_2002_mbinv_02022006.txt	County/SCC	DE
Speeds	MANEVU_2002_mbinv_02022006.txt	County/road type	DE
VMT mix	MANEVU_2002_vmtmix_02022006.txt	County/road type	
Temporal profiles	MANEVU_2002_mtpro_02022006.txt and MANEVU_2002_mtref_02022006.txt	Monthly by county/road type	DE
SMOKE MOBILE6 file listing	MANEVU_2002_mcref_02022006.txt	County	
SMOKE MOBILE6 file listing	MANEVU_2002_mvref_02022006.txt	County	

The fuel data submitted by Delaware was based on the NMIM defaults with the NMIM October data replaced by the NMIM November data. The reformulated gas fuel parameters were modeled in the SMOKE MOBILE6 input files by using the combination of the OXYGENATED FUELS, FUEL RVP, and FUEL PROGRAM (for gasoline sulfur contents) commands for each month. Statewide diesel sulfur values modeled from NMIM were 300 ppm sulfur in the summer months (June, July, and August), 280 ppm sulfur in the winter months (December, January, and February), and 290 ppm sulfur in the spring and fall months.

Data provided by Delaware indicated that the State follows the OTC-LEV program vehicle implementation schedule. Therefore, the OTC-LEV program LEV implementation schedule was included in the MOBILE6 SMOKE input files, starting implementation in the 1999 model year followed by a full implementation of the National LEV program in the 2001 model year.

b. What QA Issues were Identified and Addressed?

No QA issues were identified for Delaware.

c. What Issues Need to be Addressed in Future Versions?

None identified by the State.

3. District of Columbia

a. What Data Sources Were Used?

Table V-4 summarizes the onroad SMOKE input files that were prepared containing information for the District of Columbia. This table notes the level of detail of the data included as well as the source of the original information used to create these data files.

Table V-4. District of Columbia Onroad Data in SMOKE Input Files

	Final MANE-VU Version 3 SMOKE Input File	Level of Detail	Data Source
VMT	MANEVU_2002_mbinv_02022006.txt	County/SCC	DC
Speeds	MANEVU_2002_mbinv_02022006.txt	Road type	DC
VMT mix	MANEVU_2002_vmtmix_02022006.txt	Road type	DC
SMOKE MOBILE6 file listing	MANEVU_2002_mcref_02022006.txt	County	
SMOKE MOBILE6 file listing	MANEVU_2002_mvref_02022006.txt	County	

The District of Columbia provided 2002 VMT data in the form of the NMIM BaseYearVMT table. This table included VMT at the 28 vehicle type level for each of the six urban road types in the District of Columbia. VMT from these 28 vehicle types were then aggregated to the 12 vehicle types needed for the SMOKE MBINV input file. The VMT mix fractions by vehicle type for each county and road type were also calculated for inclusion in the SMOKE VMTMIX file. The District also provided a spreadsheet including the daily average weighted speed by roadway class. These speeds were incorporated in the SMOKE MBINV file. The District of Columbia provided the following data that were incorporated into the monthly MOBILE6 input files for the SMOKE modeling:

- District-wide registration distribution;
- I/M program and ATP inputs; and
- Weekday trip length distribution file.

The District of Columbia specified that the NMIM fuel program default data for the District should be used for the MANE-VU modeling. This included reformulated gasoline district wide, modeled using the FUEL RVP, and FUEL PROGRAM (for gasoline sulfur contents) commands for each month. Statewide diesel sulfur values modeled from NMIM were 329 ppm sulfur in the summer months (June, July, and August), 324 ppm sulfur in the winter months (December, January, and February), and 326 ppm sulfur in the spring and fall months.

Data provided by the District of Columbia indicated that the District follows the OTC-LEV program vehicle implementation schedule. Therefore, the OTC-LEV program LEV implementation schedule was included in the MOBILE6 SMOKE input files, starting implementation in the 1999 model year followed by a full implementation of the National LEV program in the 2001 model year.

b. What QA Issues were Identified and Addressed?

No QA issues were identified for the District of Columbia.

c. What Issues Need to be Addressed in Future Versions?

The SMOKE MOBILE6 files for the District of Columbia should include the OXYGENATED FUELS command to fully model reformulated gasoline in the District of Columbia. This command was inadvertently left out of the SMOKE MOBILE6 files.

4. Maine

a. What Data Sources Were Used?

Table V-5 summarizes the onroad SMOKE input files that were prepared containing information for the State of Maine. This table notes the level of detail of the data included as well as the source of the original information used to create these data files.

Table V-5. Maine Onroad Data in SMOKE Input Files

	Final MANE-VU Version 3 SMOKE Input File	Level of Detail	Data Source
VMT	MANEVU_2002_mbinv_02022006.txt	County/SCC	ME
Speeds	MANEVU_2002_mbinv_02022006.txt	County/road type	ME
VMT mix	MANEVU_2002_vmtmix_02022006.txt	Statewide/road type	Default
SMOKE MOBILE6 file listing	MANEVU_2002_mcref_02022006.txt	County	
SMOKE MOBILE6 file listing	MANEVU_2002_mvref_02022006.txt	County	

Maine provided 2002 average daily VMT by county and 12 roadway types. Maine had no information available on the distribution of VMT among vehicle types. Therefore, Pechan developed the VMT by county, roadway type, and vehicle type by using the default MOBILE6 2002 VMT mix by vehicle type. These VMT data were converted to annual VMT by multiplying the average daily VMT by 365. The MOBILE6 VMT default mix fractions by vehicle type for 2002 were included for Maine in the SMOKE VMTMIX file. Maine also provided average speed data by county and roadway type. These data were included in the SMOKE MBINV file.

Maine provided the following data that were incorporated into the monthly MOBILE6 input files for the SMOKE modeling:

- I/M program inputs and ATP inputs for Cumberland County only; and
- Monthly average RVP data.

Statewide diesel sulfur values were obtained from the NMIM defaults for Maine. A diesel sulfur value of 390 ppm sulfur was modeled in the summer months (June, July, and August), 338 ppm sulfur in the winter months (December, January, and February), and 364 ppm sulfur in the spring and fall months.

Data provided by Maine indicated that the State follows the OTC-LEV program vehicle implementation schedule. Therefore, the OTC-LEV program LEV implementation schedule was included in the MOBILE6 SMOKE input files, starting implementation in the 1999 model year followed by a full implementation of the National LEV program in the 2001 model year.

b. What QA Issues were Identified and Addressed?

No QA issues were identified for Maine.

c. What Issues Need to be Addressed in Future Versions?

None identified by the State.

5. Maryland

a. What Data Sources Were Used?

Table V-6 summarizes the onroad SMOKE input files that were prepared containing information for the State of Maryland. This table notes the level of detail of the data included as well as the source of the original information used to create these data files.

Maryland submitted annual VMT data in the form of a NIF tblMobilePE table. This included VMT by county, 12 vehicle types, and 12 road types. These VMT data were then converted to the format needed for the SMOKE MBINV file. Pechan calculated VMT mix fractions from the VMT data supplied by Maryland to obtain the VMT mixes by county and road type contained in the SMOKE VMTMIX file. In addition, Maryland provided monthly VMT distribution data by road type. Pechan converted these data to the format needed for the SMOKE MTPRO and MTREF files. The same set of monthly temporal profiles were applied to all counties in Maryland. Maryland also provided a spreadsheet showing the average speed Statewide for each of the 12 roadway types. These speed data were included in the SMOKE MBINV file.

Maryland provided the following data that were incorporated into the monthly MOBILE6 input files for the SMOKE modeling:

- County-specific registration distribution;
- County-specific diesel sales fractions;
- I/M program inputs and ATP inputs to be applied in the 14 I/M counties; and
- Statewide monthly diesel sulfur content data.

Maryland indicated that the NMIM default fuel parameters for Maryland should be used in the MANE-VU modeling. This fuel data includes reformulated gasoline in 14 of the Maryland counties. The reformulated gasoline program was modeled using the FUEL RVP, and FUEL PROGRAM (for gasoline sulfur contents) commands for each month. Maryland provided monthly Statewide diesel sulfur values. These values ranged from 455 ppm sulfur to 500 ppm sulfur. These values were included in the corresponding monthly SMOKE MOBILE6 input files.

Table V-6. Maryland Onroad Data in SMOKE Input Files

	Final MANE-VU Version 3 SMOKE Input File	Level of Detail	Data Source
VMT	MANEVU_2002_mbinv_02022006.txt	County/SCC	MD
Speeds	MANEVU_2002_mbinv_02022006.txt	County/road type	MD
VMT mix	MANEVU_2002_vmtmix_02022006.txt	County/road type	MD
Temporal profiles	MANEVU_2002_mtpro_02022006.txt and MANEVU_2002_mtref_02022006.txt	Statewide monthly by road type	MD
SMOKE MOBILE6 file listing	MANEVU_2002_mcref_02022006.txt	County	
SMOKE MOBILE6 file listing	MANEVU_2002_mvref_02022006.txt	County	

Data provided by Maryland indicated that the State follows the OTC-LEV program vehicle implementation schedule. Therefore, the OTC-LEV program LEV implementation schedule was included in the MOBILE6 SMOKE input files, starting implementation in the 1999 model year followed by a full implementation of the National LEV program in the 2001 model year.

b. What QA Issues were Identified and Addressed?

No QA issues were identified for Maryland affecting the modeling inventory files.

c. What Issues Need to be Addressed in Future Versions?

The SMOKE MOBILE6 files for Maryland should include the OXYGENATED FUELS command to fully model reformulated gasoline in the Maryland counties that implement the reformulated gasoline program. This command was inadvertently left out of the Maryland SMOKE MOBILE6 files.

6. Massachusetts

a. What Data Sources Were Used?

Table V-7 summarizes the onroad SMOKE input files that were prepared containing information for the State of Massachusetts. This table notes the level of detail of the data included as well as the source of the original information used to create these data files.

Table V-7. Massachusetts Onroad Data in SMOKE Input Files

	Final MANE-VU Version 3 SMOKE Input File	Level of Detail	Data Source
VMT	MANEVU_2002_mbinv_02022006.txt	County/SCC	MA
Speeds	MANEVU_2002_mbinv_02022006.txt	County/road type	MA
VMT mix	MANEVU_2002_vmtmix_02022006.txt	County/road type	Default
Temporal profiles	MANEVU_2002_mtpro_02022006.txt and MANEVU_2002_mtref_02022006.txt	Monthly by county	MA
SMOKE MOBILE6 file listing	MANEVU_2002_mcref_02022006.txt	County	
SMOKE MOBILE6 file listing	MANEVU_2002_mvref_02022006.txt	County	

The Version 3 MANE-VU onroad modeling for Massachusetts differed from the Version 2 modeling, based on updates provided by Massachusetts in December 2005. The primary changes for Massachusetts from Version 3 is the use of updated 2002 VMT data and vehicle speed date. Massachusetts provided a spreadsheet containing revised VMT values and vehicle speeds for 2002 by county and SCC. Pechan prepared the revised Massachusetts VMT data and the speed data in the format of the SMOKE MBINV file. Using the revised VMT data by SCC, Pechan calculated the updated VMT mixes by vehicle type for each county and road type in Massachusetts and formatted the resulting data to be included in the SMOKE VMTMIX file.

The original VMT data submitted by Massachusetts included VMT for each of the four seasons. Pechan used these data to develop monthly VMT temporal profiles. Seasonal VMT was assigned to the months in that season based on the ratio of the number of days in a specific month to the number of days in the season. Pechan then formatted the monthly temporal VMT allocation factors for inclusion in the SMOKE MTPRO and MTREF files.

Massachusetts provided the following data that were incorporated into the monthly MOBILE6 input files for the SMOKE modeling:

- Statewide registration distribution;
- Statewide I/M program inputs and ATP inputs;
- RVP and fuel program data;
- Diesel sulfur content of 350 ppm sulfur year-round and statewide; and
- Massachusetts-specific LEV and Tier 2 implementation files.

Northern reformulated gasoline was modeled statewide throughout the State, with a RVP value of 6.7 psi during the ozone season and 13.5 psi during the remaining months, based on inputs provided by Massachusetts. The section below on QA issues for Massachusetts discusses the fuel inputs modeled in the Version 3 SMOKE MOBILE6 input files in more detail. Massachusetts provided the necessary inputs to model the State's LEV implementation schedule and Tier 2 data, which differ from the OTC-LEV program and from the default MOBILE6 Tier 2 data.

b. What QA Issues were Identified and Addressed?

In addition to the VMT updates, Pechan revised the SMOKE MOBILE6 input files for Massachusetts for Version 3. This was done because Version 2 of the MANE-VU modeling inventory was prepared using the default setting of MOBILE6 to model reformulated gasoline (i.e., using the command line "FUEL PROGRAM : 2 N"). Since the time that the Version 2 inventory was created, EPA found a bug with the sulfur content values used when the default reformulated gasoline command is used. To eliminate this problem, Pechan created revised SMOKE MOBILE6 input files for Massachusetts that model reformulated gasoline by explicitly setting the RVP, gasoline sulfur contents, and gasoline oxygen contents. The gasoline sulfur contents and gasoline oxygen contents were set according to the default parameters laid out in the MOBILE6 user's guide. The summer (May through September) sulfur content is 129 ppm in 2002 and the winter sulfur content is 279 ppm in 2002. The summer gasoline contains 2.1 percent oxygen, with MTBE as the oxygenate. The winter gasoline contains 1.5 percent oxygen in 70 percent of the fuel having MTBE as the oxygenate, and 3.5 percent oxygen in 30 percent of the fuel having ETOH as the oxygenate. The RVP values were not changed from those modeled in Version 2 (6.7 psi in the summer and 13.5 psi in the winter).

c. What Issues Need to be Addressed in Future Versions?

None identified by the State.

7. New Hampshire

a. What Data Sources Were Used?

Table V-8 summarizes the onroad SMOKE input files that were prepared containing information for the State of New Hampshire. This table notes the level of detail of the data included as well as the source of the original information used to create these data files.

Table V-8. New Hampshire Onroad Data in SMOKE Input Files

	Final MANE-VU Version 3 SMOKE Input File	Level of Detail	Data Source
VMT	MANEVU_2002_mbinv_02022006.txt	County/SCC	NH
Speeds	MANEVU_2002_mbinv_02022006.txt	County/road type	NH
VMT mix	MANEVU_2002_vmtmix_02022006.txt	Statewide	NH
SMOKE MOBILE6 file listing	MANEVU_2002_mcref_02022006.txt	County	
SMOKE MOBILE6 file listing	MANEVU_2002_mvref_02022006.txt	County	

The VMT inputs provided by New Hampshire were in the form of summer day VMT by county or nonattainment area and roadway type. In addition, New Hampshire provided a Statewide VMT mix distribution by 16 vehicle types in the MOBILE6 files provided by the State. Pechan then developed a simple MOBILE6 input file that used the New Hampshire Statewide registration distribution and the Statewide VMT mix by vehicle type. Pechan used the resulting MOBILE6 output file to extract the 28 vehicle type VMT mix to be applied Statewide to the county/roadway type VMT data. Summer day miles were converted to annual miles by using national data from the Federal Highway Administration's Travel Volume Trends which provides 2002 monthly VMT for groups of road categories. Additionally, the VMT data from the three New Hampshire nonattainment areas represented four counties. To allocate these VMT by county, Pechan first totaled the VMT data from these three nonattainment areas by roadway type. Then, using ratios developed from the preliminary 2002 NEI VMT, Pechan allocated the grouped VMT by county and roadway type. With VMT for the entire State at the county/roadway type level of detail, Pechan then multiplied the VMT data by the 28 vehicle type VMT fractions to obtain a VMT file at the 28 vehicle type level and 12 roadway type level by county for use in preparing the annual onroad emission inventory. VMT from these 28 vehicle types were then aggregated to the 12 vehicle types needed for the SMOKE MBINV input file. The VMT mix fractions by vehicle type for each county and road type were also calculated for inclusion in the SMOKE VMTMIX file. New Hampshire also provided a spreadsheet including the average speed by roadway class for each county or county group. These speeds were incorporated in the SMOKE MBINV file.

New Hampshire provided the following data that were incorporated into the monthly MOBILE6 input files for the SMOKE modeling:

- Statewide registration distribution; and
- Statewide ATP inputs.

New Hampshire specified that the NMIM fuel program default data for New Hampshire should be used for the MANE-VU modeling. This included reformulated gasoline in four counties, modeled using the FUEL RVP, and FUEL PROGRAM (for gasoline sulfur contents) commands for each month. Statewide diesel sulfur values modeled from NMIM were 400 ppm sulfur in the summer months (June, July, and August), 340 ppm sulfur in the winter months (December, January, and February), and 370 ppm sulfur in the spring and fall months.

Data provided by New Hampshire indicated that the State follows the OTC-LEV program vehicle implementation schedule. Therefore, the OTC-LEV program LEV implementation schedule was included in the MOBILE6 SMOKE input files, starting implementation in the 1999 model year followed by a full implementation of the National LEV program in the 2001 model year.

b. What QA Issues were Identified and Addressed?

Through the State QA report process, New Hampshire provided updated inputs for VMT and speeds that were incorporated in the modeling inventory inputs.

c. What Issues Need to be Addressed in Future Versions?

The SMOKE MOBILE6 files for the four New Hampshire that implement reformulated gasoline should include the OXYGENATED FUELS command to fully model the benefits reformulated gasoline. This command was inadvertently left out of the SMOKE MOBILE6 files.

8. New Jersey

a. What Data Sources Were Used?

Table V-9 summarizes the onroad SMOKE input files that were prepared containing information for the State of New Jersey. This table notes the level of detail of the data included as well as the source of the original information used to create these data files.

Table V-9. New Jersey Onroad Data in SMOKE Input Files

	Final MANE-VU Version 3 SMOKE Input File	Level of Detail	Data Source
VMT	MANEVU_2002_mbinv_02022006.txt	County/SCC	NJ
Speeds	MANEVU_2002_mbinv_02022006.txt	Road type/3 vehicle groups	Default NEI
VMT mix	MANEVU_2002_vmtmix_02022006.txt	County/road type	NJ
Temporal profiles	MANEVU_2002_mtpro_02022006.txt and MANEVU_2002_mtref_02022006.txt	Monthly by 3 county groups and weekday/weekend	NJ
SMOKE MOBILE6 file listing	MANEVU_2002_mcref_02022006.txt	County	
SMOKE MOBILE6 file listing	MANEVU_2002_mvref_02022006.txt	County	

Updates were made to the Version 2 MOBILE6 SMOKE inputs for New Jersey in December 2005 to create Version 3, based on revised data provided by the State. New Jersey provided the following files:

- a set of SMOKE MOBILE6 input files by county and month;
- NJ_2002_mbinv.txt file that contained revised VMT and speeds by county and SCC, generated by NJDEP in August 2005, in SMOKE format;
- amptref.m3.manevu.vistascem.032805_NJVMT.txt—a SMOKE-formatted file containing county/SCC-level temporal profile cross-references;
- amptro.m3.manevu.vistascem.032805_NJVMT.txt—a SMOKE-formatted file containing county-specific VMT temporal profiles prepared by NJDEP in August 2005; and
- zip files containing external files needed to run the SMOKE MOBILE6 files.

After an initial review of these files, Pechan did not note any differences in the SMOKE MOBILE6 files from the Version 2 files. Pechan then confirmed with New Jersey that the only changes from the Version 2 date were in the VMT data. The VMT and speed data by county and SCC in the MBINV file provided by New Jersey were copied to the MANE-VU SMOKE MBINV file, replacing the VMT and speed data from the Version 2 SMOKE MBINV file for New Jersey. The speed data included by New Jersey are the default NEI speeds by road type and vehicle type. Using the new VMT data provided by New Jersey, Pechan calculated a revised set of VMT mix fractions by vehicle type and included these in the Version 3 SMOKE VMTMIX file. Pechan pasted the temporal profiles provided for New Jersey into the SMOKE MTPRO file. This included monthly temporal profiles and diurnal temporal profiles. The diurnal temporal profiles were applied to both weekdays and weekends. Similarly the temporal cross reference data included in the file provided by New Jersey was pasted into the SMOKE MTREF file for MANE-VU Version 3.

The following New Jersey-provided were included in the monthly MOBILE6 input files for the SMOKE modeling:

- Statewide registration distribution;
- Statewide diesel sales fractions;
- Statewide I/M program and ATP inputs; and
- Diesel sulfur content data (340 ppm statewide).

Northern reformulated gasoline was modeled statewide throughout the State, using NMIM fuel program input defaults for New Jersey. The section below on QA issues for New Jersey discusses the fuel inputs modeled in the Version 3 SMOKE MOBILE6 input files in more detail.

Data provided by New Jersey indicated that the State follows the OTC-LEV program vehicle implementation schedule. Therefore, the OTC-LEV program LEV implementation schedule was included in the MOBILE6 SMOKE input files, starting implementation in the 1999 model year followed by a full implementation of the National LEV program in the 2001 model year.

b. *What QA Issues were Identified and Addressed?*

As discussed above for New Jersey, the Version 2 New Jersey SMOKE MOBILE6 input files modeled reformulated gasoline using the command line "FUEL PROGRAM : 2 N", which is the default method for modeling reformulated gasoline with MOBILE6. To eliminate the effects of the MOBILE6 reformulated gasoline bug from the SMOKE MOBILE6 inputs, Pechan explicitly modeled the reformulated gasoline program in the New Jersey MOBILE6 input files by explicitly modeling the appropriate settings of the RVP, oxygenated fuel content commands, and gasoline sulfur commands. The values for oxygenated fuel settings and gasoline sulfur contents by month were extracted from the NMIM county-level database used in developing the annual emissions inventory for the MANE-VU Version 2 onroad emissions inventory.

c. *What Issues Need to be Addressed in Future Versions?*

None identified by the State.

9. New York

a. *What Data Sources Were Used?*

Table V-10 summarizes the onroad SMOKE input files that were prepared containing information for the State of New York. This table notes the level of detail of the data included as well as the source of the original information used to create these data files.

Table V-10. New York Onroad Data in SMOKE Input Files

	Final MANE-VU Version 3 SMOKE Input File	Level of Detail	Data Source
VMT	MANEVU_2002_mbinv_02022006.txt	County/SCC	NY
Speeds	MANEVU_2002_mbinv_02022006.txt	Road type/3 vehicle groups	Default NEI
Speed profiles	MANEVU_2002_spdpro.txt and MANEVU_2002_spdref.txt	County/hour/road type	NY
VMT mix	MANEVU_2002_vmtmix_02022006.txt	County/road type	NY
Temporal profiles	MANEVU_2002_mtpro_02022006.txt and MANEVU_2002_mtref_02022006.txt	Monthly by 3 county groups	NY
SMOKE MOBILE6 file listing	MANEVU_2002_mcref_02022006.txt	County	
SMOKE MOBILE6 file listing	MANEVU_2002_mvref_02022006.txt	County	

VMT for New York was provided in the form of a NIF PE table. These VMT data were extracted and included in the SMOKE MBINV file. VMT mix fractions by vehicle type were calculated from these VMT data and included in the SMOKE VMTMIX file.

New York provided a spreadsheet with average speeds in each of four daily time periods by county and road type. Pechan converted these speed data to the SMOKE SPDPRO format, assigning the speed for a given time period to all hours included in that time period. Pechan also prepared the SMOKE SPDREF file to appropriately cross reference each county and road type to the corresponding hourly speed profile. Because these more detailed speed files were provided for New York, the average speed by road type and county in the MBINV file was populated with default NEI speeds.

New York also provided spreadsheets showing monthly VMT by county and roadtype. After processing these VMT values to develop monthly temporal factors, Pechan observed that there were only three unique monthly profiles in this data set. These three profiles were then added to the SMOKE MTPRO file. Pechan then matched each county and road type in the State to the corresponding monthly VMT profile in the SMOKE MTREF file.

New York provided the following data that were incorporated into the monthly MOBILE6 input files for the SMOKE modeling:

- Registration distributions—one for the New York metropolitan area and one for the rest of the State;
- Diesel sales fractions—one for the New York metropolitan area and one for the rest of the State;
- Statewide mileage accumulation rate input;
- Monthly RVP data—one set for the New York metropolitan area and one for the rest of the State;
- Reformulated gasoline program inputs for affected counties modeled with MOBILE6 defaults (i.e., "FUEL PROGRAM : 2 N");
- I/M program inputs for affected counties;
- Statewide ATP inputs;
- Hourly VMT distributions by county group;
- Start distributions by county;
- Diesel sulfur content data (400 ppm statewide).

New York also provided the necessary input files to model the State's LEV program implementation schedule, which differs from the OTC LEV program. New York also provided MOBILE6 Tier 2 modeling files to be used along with the New York LEV program inputs. These inputs were included in the SMOKE MOBILE6 modeling.

b. What QA Issues were Identified and Addressed?

No QA issues were identified for New York affecting the modeling inventory files.

c. What Issues Need to be Addressed in Future Versions?

None identified by the State.

10. Pennsylvania

a. What Data Sources Were Used?

Table V-11 summarizes the onroad SMOKE input files that were prepared containing information for the State of Pennsylvania. This table notes the level of detail of the data included as well as the source of the original information used to create these data files.

Table V-11. Pennsylvania Onroad Data in SMOKE Input Files

	Final MANE-VU Version 3 SMOKE Input File	Level of Detail	Data Source
VMT	MANEVU_2002_mbinv_02022006.txt	County/SCC	PA
Speeds	MANEVU_2002_mbinv_02022006.txt	County/road type	PA
VMT mix	MANEVU_2002_vmtmix_02022006.txt	County/road type	PA
Temporal profiles	MANEVU_2002_mtpro_02022006.txt and MANEVU_2002_mtref_02022006.txt	Monthly by county	PA
SMOKE MOBILE6 file listing	MANEVU_2002_mcref_02022006.txt	County	
SMOKE MOBILE6 file listing	MANEVU_2002_mvref_02022006.txt	County	

Pennsylvania provided a database file (NEIANN02.dbf) that contained the VMT and speed data by county, roadway type, and vehicle type. This included the same VMT used in the calculation of the annual onroad inventory submitted by Pennsylvania for MANE-VU. Pechan converted the data from this database file into VMT and speed data in the format of the SMOKE MBINV file. From the VMT data, Pechan calculated VMT fractions by vehicle type by county and road type for inclusion in the SMOKE VMTMIX file. Pennsylvania also provided estimates of VMT by month for each county. Pechan converted these data to monthly allocation factors in the format needed by the SMOKE MTPRO and MTREF files. A separate monthly profile was developed for each county, but applied to all road types within that county.

Pennsylvania provided the following data that were incorporated into the monthly MOBILE6 input files for the SMOKE modeling:

- Registration distributions for each individual county;
- I/M program and ATP inputs for affected Philadelphia and Pittsburgh area counties (inputs differ for the two areas);
- Monthly RVP data for all counties including 7.8 psi RVP program from May through September for Pittsburgh counties;
- Reformulated gasoline for the 5-county Philadelphia area modeled with MOBILE6 defaults (i.e., "FUEL PROGRAM : 2 N"); and
- Diesel sulfur content data (500 ppm statewide).

Data provided by Pennsylvania indicated that the State follows the OTC-LEV program vehicle implementation schedule. Therefore, the OTC-LEV program LEV implementation schedule was included in the MOBILE6 SMOKE input files, starting implementation in the 1999 model year followed by a full implementation of the National LEV program in the 2001 model year.

b. What QA Issues were Identified and Addressed?

No QA issues were identified for Pennsylvania affecting the modeling inventory files.

c. What Issues Need to be Addressed in Future Versions?

None identified by the State.

11. Rhode Island

a. What Data Sources Were Used?

Table V-12 summarizes the onroad SMOKE input files that were prepared containing information for the State of Rhode Island. This table notes the level of detail of the data included as well as the source of the original information used to create these data files.

Table V-12. Rhode Island Onroad Data in SMOKE Input Files

	Final MANE-VU Version 3 SMOKE Input File	Level of Detail	Data Source
VMT	MANEVU_2002_mbinv_02022006.txt	County/SCC	RI
Speeds	MANEVU_2002_mbinv_02022006.txt	County group/road type	RI
VMT mix	MANEVU_2002_vmtmix_02022006.txt	Statewide	RI
SMOKE MOBILE6 file listing	MANEVU_2002_mcref_02022006.txt	County	
SMOKE MOBILE6 file listing	MANEVU_2002_mvref_02022006.txt	County	

Rhode Island provided a spreadsheet with the 2002 VMT as well as Statewide 2002 VMT fractions by 16 vehicle types. Pechan prepared a simple MOBILE6 input file including this Rhode Island 2002 VMT mix by vehicle type and the 2002 Rhode Island registration distribution. The VMT mix in the MOBILE6 output file at the 28 vehicle type level was then used to distribute the VMT by vehicle category. The 2002 daily VMT was at the State level, broken down by the 12 roadway types. To allocate these VMT data to the county/road type level of detail, Pechan summed the VMT from the preliminary version of EPA's 2002 NEI for Rhode Island first by State and roadway type and then by county and roadway type. Pechan calculated county/roadway type VMT fractions by dividing the VMT at the county/roadway type level by the State/roadway type VMT for the same roadway type. These fractions were then multiplied by the VMT supplied by Rhode Island at the State/roadway type level of detail to obtain county/roadway type VMT data. These county/roadway type VMT data were then multiplied by the 28 vehicle type VMT fractions to obtain VMT at the level of detail needed to populate the NMIM BaseYearVMT table for calculating the annual inventory and were then summed to the 16-vehicle type level of detail for use in the SMOKE MBINV file. The data were also converted from daily VMT to annual by multiplying the average daily VMT by 365. VMT mix fractions from this final data set were then formatted in the SMOKE VMTMIX format at the State level of detail. Statewide speeds by road type, as provided by Rhode Island, were included in the SMOKE MBINV file.

Rhode Island provided the following data that were incorporated into the monthly MOBILE6 input files for the SMOKE modeling:

- Statewide registration distribution; and
- Statewide I/M program inputs.

Data for fuel parameters were obtained from the NMIM national county database for Rhode Island. This included reformulated gasoline Statewide, modeled using the FUEL RVP, and FUEL PROGRAM (for gasoline sulfur contents) commands for each month. These values differed by season, but were consistent Statewide. Statewide diesel sulfur values modeled from NMIM were 400 ppm sulfur in the summer months (June, July, and August), 340 ppm sulfur in the winter months (December, January, and February), and 370 ppm sulfur in the spring and fall months.

The NMIM default LEV program for Rhode Island was modeled, which includes the OTC-LEV program LEV implementation schedule.

b. What QA Issues were Identified and Addressed?

No QA issues were identified for Rhode Island.

c. What Issues Need to be Addressed in Future Versions?

The Rhode Island SMOKE MOBILE6 input files did not include the OXYGENATED FUELS command. This should have been used to fully characterize the parameters of reformulated gasoline that is used Statewide in Rhode Island.

12. Vermont

a. What Data Sources Were Used?

Table V-13 summarizes the onroad SMOKE input files that were prepared containing information for the State of Vermont. This table notes the level of detail of the data included as well as the source of the original information used to create these data files.

Table V-13. Vermont Onroad Data in SMOKE Input Files

	Final MANE-VU Version 3 SMOKE Input File	Level of Detail	Data Source
VMT	MANEVU_2002_mbinv_02022006.txt	County/SCC	VT
Speeds	MANEVU_2002_mbinv_02022006.txt	Road type/vehicle group (light-duty vs. heavy-duty)	VT
VMT mix	MANEVU_2002_vmtmix_02022006.txt	County/road type	VT
Temporal profiles	MANEVU_2002_mtpro_02022006.txt and MANEVU_2002_mtref_02022006.txt	Monthly statewide	
SMOKE MOBILE6 file listing	MANEVU_2002_mcref_02022006.txt	County	
SMOKE MOBILE6 file listing	MANEVU_2002_mvref_02022006.txt	County	

Vermont submitted VMT data in the format of the NIF PE table. Vermont then provided updated VMT data for three road classifications (rural minor collectors, rural local roads, and urban local roads) in December 2004, after the time that these changes could be included in the MANE-VU annual onroad emission inventory. However, the updated VMT were included in the MANE-VU Version 3 onroad SMOKE modeling files. This VMT change resulted in a Statewide decrease in VMT from about 9.5 billion miles to about 7.8 billion miles. As a result, the SMOKE modeling performed by MANE-VU will not match the MANE-VU emission inventory for Vermont. The VMT data were converted to the SMOKE MBINV file format. VMT mix fractions were calculated from the VMT data and included in the SMOKE VMTMIX file. Vermont also provided information on the temporal allocation of VMT. From these data, Pechan prepared a monthly VMT profile for Vermont and included the data in the SMOKE MTPRO and MTREF files.

Vermont provided information on Statewide speeds by roadway type. These speeds differed for light-duty vehicles and heavy-duty vehicles. Pechan incorporated this speed information into the SMOKE MBINV file.

Vermont provided the following data that were incorporated into the monthly MOBILE6 input files for the SMOKE modeling:

- Statewide registration distribution;
- Statewide I/M program inputs; and
- RVP data.

The RVP data provided by Vermont were based on data from a local gasoline tank farm and resulted in an RVP value of 8.5 psi during the ozone season months (May through September) and 9.47 psi for the remaining months. Data for fuel parameters other than RVP (e.g., diesel and gasoline fuel sulfur content) were obtained from the NMIM national county database for Vermont. These values differed by season, but were consistent Statewide. Statewide diesel sulfur values modeled from NMIM were 300 ppm sulfur in the summer months (June, July, and August), 290 ppm sulfur in the winter months (December, January, and February), and 295 ppm sulfur in the spring and fall months.

The NMIM default LEV program for Vermont was modeled, which includes Vermont's State-specific LEV implementation schedule.

b. *What QA Issues were Identified and Addressed?*

Through the State QA report process, Vermont provided a missing registration data file, RVP data and revised VMT.

c. *What Issues Need to be Addressed in Future Versions?*

None identified by the State.

CHAPTER VI – BIOGENIC SOURCES

A. General Methods for all States

1. What Data Sources Were Used?

Biogenic emissions for the time period from January 1, 2002 – December 31, 2002 were calculated by the New York State Department of Environmental Conservation (NYSDEC) for all of the MANE-VU states using the Biogenic Emissions Inventory System (BEIS) version 3.12 integrated within SMOKE2.1. The inventory was prepared at the state-level for CO, nitrous oxide (NO), and VOC.

General information about BEIS is available at http://www.epa.gov/AMD/biogen.html while documentation about biogenic emissions processing within SMOKE2.1 is available at http://cf.unc.edu/cep/empd/products/smoke/version2.1/html/ch06s10.html and http://cf.unc.edu/cep/empd/products/smoke/version2.1/html/ch06s17.html. Note that the SMOKE documentation refers to BEIS3.09 and has not yet been updated for BEIS3.12. This affects the number of species modeled as well as the use of different speciation profiles. However, the general processing approach has not changed from BEIS3.09 to BEIS3.12. In short, this processing approach is as follows and was utilized by NYSDEC for its biogenic emission processing for MANE-VU and the OTC modeling:

- **Normbeis3** reads gridded land use data and emissions factors and produces gridded normalized biogenic emissions for 34 species/compounds. The gridded land use file utilized by NYSDEC includes the fractional coverage of 230 different land use types for each of the 172 * 172 12-km grid cells in the MANE-VU/OTC modeling domain. In a separate BEIS3.12 input file, both summer and winter emissions factors for each species/compound are provided for each of the 230 land use types. On output, **Normbeis3** generates a file `B3GRD` which contains gridded summer and winter emission fluxes for the modeling domain that are normalized to 30 °C and a photosynthetic active radiation (PAR) of 1000 $\mu mol/m^2s$. In addition, gridded summer and winter leaf area indices (LAI) are also written to `B3GRD`.

- **Tmpbeis3** reads the gridded, normalized emissions file B3GRD and meteorological data from the MCIP-processed MM5 meteorological fields generated by the University of Maryland for MANE-VU/OTC modeling. Specifically, the following MM5/MCIP meteorological variables are used by **Tmpbeis3** to compute hour-specific, gridded biogenic emissions from the normalized emission fluxed contained in B3GRD: layer-1 air temperature ("TA"), layer-1 pressure ("PRES"), total incoming solar radiation at the surface ("RGRND"), and convective ("RC") and non-convective ("RN") rainfall. Additionally, the emissions for the 34 species/compounds modeled by BEIS3.12 are converted to CO, NO, and the CB-IV VOC species utilized in CMAQ via the use of the BEIS3.12-CB-IV speciation profile. Furthermore, an external file, BIOSEASON, was utilized to decide whether to use summer or winter emissions factors for any given grid cell on any given day. This file was generated by the SMOKE2.1 utility **Metscan** based on MM5 layer-1 air temperatures to determine the date of the last spring frost and first fall frost at each grid cell. Summer emission factors are used by **Tmpbeis3** for the time period between the day of the last spring frost and the day of the first fall frost at any given grid cell, and winter emission factors are used for the remaining time period. Documentation for the **Metscan** utility is available at http://cf.unc.edu/cep/empd/products/smoke/version2.1/html/ch05s07.html. An animated GIF file showing the BIOSEASON file used by NYSDEC can be found at ftp://ftp.dec.state.ny.us/dar/air_research/chogrefe/biog_reports/b3season_movie.gif.

- For reporting purposes, the hourly, speciated, gridded emissions were aggregated to the county level for each day. For any given grid cell, emissions were distributed among the counties intersecting this grid cell in proportion to the area of each of these counties within the grid cell. The area gridding surrogates needed for this aggregation are based on a file obtained from EPA via http://www.epa.gov/ttn/chief/emch/spatial/new/bgpro.2km_041604.us.gz, followed by windowing for the MANE-VU/OTC modeling domain.

2. Version 3 Emissions Summary

Table VI-1 presents a State-level summary of the annual biogenic source emissions in Version 3 of the 2002 MANE-VU inventory. The annual emissions are based on the sum of the daily emissions prepared using the modeling approach previously discussed.

Table VI-1. Version 3 2002 MANE-VU Biogenic Source Emissions by State (Tons/Year)

State	CO	NO	VOC*
Connecticut	6,889	560	64,017
Delaware	4,274	990	46,343
District of Columbia	150	30	1,726
Maine	64,936	2,018	600,205
Maryland	18,351	2,934	210,104
Massachusetts	11,594	1,257	113,958
New Hampshire	14,306	482	141,894
New Jersey	14,058	1,813	181,617
New York	63,436	8,313	492,487
Pennsylvania	59,946	8,646	585,272
Rhode Island	1,764	211	19,233
Vermont	14,745	1,142	118,377
MANE-VU	274,451	28,396	2,575,232

* VOC emissions were calculated by adding the emissions for the following pollutants: ALD2, ETH, FORM, ISOP, NR, OLE, PAR, TERB, TOL, XYL.

B. State-Specific Methods

No state-specific methods were used in Version 3 of the MANE-VU inventory for biogenic emissions.

CHAPTER VII. TEMPORAL, SPECIATION, AND SPATIAL ALLOCATION PROFILES AND PREPARATION OF SMOKE (IDA) AND RPO DATA EXCHANGE PROTOCOL (NIF 3.0) FORMATS

Table VII-1 provides a summary of the file names and documentation used for modeling inputs for Version 3 of MANE-VU's 2002 inventory for point, area, nonroad, and onroad sources. The final input files used for temporal allocation, speciation, and spatial allocation of emissions were developed for Version 1 of the 2002 inventory and delivered to MARAMA during January 2005 (MANE-VU, 2005). These files were developed starting with the latest model input files available from EPA and then revised to include updates needed for the MANE-VU region or to add SCCs and profile assignments not included in the initial EPA data sets. The files were revised between September 2004 and January 2005 to incorporate comments provided by MANE-VU. Files in Table VII-1 with a date that is later than January 2005 were prepared to support modeling for Version 3. The notes column in the table identifies the modifications made to the files if the files were changed after this date. Otherwise, files with a date later than January 2005 were either provided by a state agency or were obtained from EPA and used for modeling Version 3.

The remainder of this chapter provides a brief summary of the revisions made to the EPA data sets prepared for Version 1 of the 2002 MANE-VU inventory and subsequently carried for the modeling for Version 3. Sections A, B, and C of this chapter discuss how the temporal allocation, speciation, and spatial allocation profiles, respectively, were developed. Section D of this chapter describes how the emissions inventory data were prepared in the SMOKE (IDA) and RPO Data Exchange Protocol (NIF 3.0) Formats.

A. Temporal Profiles

1. Point and Area Sources

The most recent SMOKE temporal cross-reference files available from EPA during the summer of 2004 were used as the starting point for developing the cross-reference files for point and area sources. The following 3 classes of modifications were completed to improve the temporal allocation input files:

- Update temporal cross-reference to assign an existing profile in the default SMOKE profiles for SCCs in the MANE-VU inventory
- Create a new temporal cross-reference to an existing profile in the default SMOKE profiles for SCCs in the MANE-VU inventory; the cross-reference did not previously exist in the default SMOKE files but the profile did exist.
- Create new temporal profiles and cross-references for SCCs in the MANE-VU inventory; neither the cross-reference nor profiles for the MANE-VU SCCs previously existed in the default SMOKE files.

a. Point Sources

A total of 30 point SCCs existed in the MANE-VU point source inventory that were not in the point source cross-reference file; therefore, the SCCs were added to the cross-reference file and assigned to existing profiles based on the assignment of similar SCCs already assigned to the profiles. Table II-2 lists the SCCs along with the state and county FIPS where they occurred in the MANE-VU inventory. Temporal profiles could not be identified for the SCCs listed in Table VII-3 due to either the SCC being shorter than 8-digits or the lack of information about the source categories for identifying an appropriate profile assignment. These SCCs were assigned the default profile by SMOKE.

b. Area Sources

For area sources, the improvements to the EPA cross-reference file included updates to existing profiles in the file based on MANE-VU-specific data (see Table VII-4), addition of SCCs that were assigned to existing profiles based on the assignment of similar SCCs already assigned to the profiles (see Table VII-5), and addition of new SCCs and profiles based on MANE-VU- or RPO-specific data (see Table VII-6).

Additional cross-referencing information used to revise the temporal cross-reference file included MANE-VU county-level information for residential wood combustion, monthly temporal profiles developed for NH_3 source categories using the Carnegie Mellon University (CMU) model, and a Delaware-specific cross-reference file associated with the Delaware inventory. The additions of new SCCs and new profiles shown in Table VII-6 mostly apply to the state of Delaware (State FIPS=10). For the FIPS column, the "-9" designation means the cross-reference is applied for all counties that do not have a county or state-specific SCC cross-reference record. These changes to the temporal cross-reference file allowed for the assignment of a non-flat temporal profile (262= uniform monthly, 7=uniform weekly and 24=uniform diurnal) to 95% of the SCCs in the area inventory.

2. Nonroad Sources

Nonroad sources used the same temporal profile and cross-reference files as area sources.

3. Onroad Sources

For onroad sources, the following States provided their own data to update the default temporal profile files and the temporal cross reference files: Connecticut, Delaware, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, and Vermont. Each of these States provided VMT information that could be used to develop monthly temporal profiles. The data were provided in a variety of formats, ranging from monthly or seasonal VMT to SMOKE-formatted monthly VMT temporal profiles. Where necessary, the monthly or seasonal VMT data were converted into the SMOKE monthly temporal profile format. In addition, New Jersey provided information for diurnal temporal profiles. However, the level of detail or variability provided in these monthly profiles varied by State. Connecticut's and Delaware's profiles each varied by county and road type. Maryland's profiles applied Statewide, with variability in the profiles by road type. Massachusetts' profiles varied by county, road type, and vehicle type. Both New Jersey and New York provided information for three monthly temporal profiles, each used throughout one of the three county groups in each State. The Pennsylvania profiles varied by county, but not by road type. Vermont provided information for a single monthly temporal profile to be used throughout the State.

B. Speciation Profiles

1. Point and Area Sources

The most recent SMOKE speciation cross-reference files available from EPA during the summer of 2004 were used as the starting point for developing the cross-reference files for point and area sources. These files were revised to complete SCC assignments for the Carbon Bond IV (CB-IV) with PM mechanism for point and area sources. In addition, sulfur tagging species were added to the REMSAD7 CB-IV with PM mechanism (see Table VII-1).

a. Point Sources

Thirty-one SCCs in the MANE-VU point source inventory did not have chemical speciation profile assignments for the CB-IV with PM mechanism in the default SMOKE chemical cross-reference file. For 10 of the SCCs, assignments for VOC and $PM_{2.5}$ were added to the speciation cross-reference file based on the speciation profile codes assigned to similar SCCs. Table VII-7 shows the SCCs where an SCC speciation cross-reference record was added, the VOC and $PM_{2.5}$ speciation profile code assigned, and the method used to assign the profiles. Assignments were not completed for the remaining 21 point source SCCs because of a lack of information on the emission sources needed to complete the assignments (see Table VII-8 for the list of the SCCs).

b. Area Sources

Speciation profile assignments were completed for many area source SCCs for the CB-IV with PM mechanism and were documented in separate spreadsheet files provided to MARAMA during September 2004. Assignments for VOC and $PM_{2.5}$ were added to the speciation cross-reference file based on the speciation profile codes assigned to similar SCCs. Note that the transport fractions for fugitive dust were applied as a part of the modeling effort to adjust the mass emissions in Version 3 of the inventory.

2. Nonroad Sources

No updates to the speciation profiles or speciation assignments for nonroad sources were provided by the MANE-VU States.

3. Onroad Sources

No updates to the speciation profiles or speciation assignments for onroad sources were provided by the MANE-VU States.

C. Spatial Allocation Profiles

The most recent spatial profile data files available from EPA during the summer of 2004 were used as the starting point for developing the spatial profile file for point and area sources. A detailed description of this surrogate dataset was provided in a file named "surrogate_ documentation_workbook052804.xls" from EPA's website at: http://www.epa.gov/ttn/ chief/emch/spatial/newsurrogate.html. Many SCCs in the MANE-VU inventory did not have surrogate assignments in the default SMOKE gridding cross-reference file. About 200 SCC assignments were added to the gridding cross-reference file. The assignments were based on matching surrogate descriptions from the EPA99 surrogate data with the SCC descriptions.

No updates to the spatial allocation files for nonroad and onroad sources were provided by the MANE-VU States.

D. Preparation of SMOKE (IDA) and RPO Data Exchange Protocol (NIF 3.0) Formats

Table VII-9 identifies the mass emissions and SMOKE input files for Version 3 of the MANE-VU point, area, nonroad, and onroad inventories.

The SMOKE input file format contains one field for storing daily emissions for each pollutant. The area source inventory contains summer day, winter day, and average day emissions depending on the state and source category. Thus, two sets of SMOKE input files were prepared for the area source inventory. One file contains annual, summer day, and average day emissions and the other file contains annual, winter day, and average day emissions. If summer day and average day emissions were provided for the same process and pollutant in the inventory, the summer day value was included in the SMOKE input file. If winter day and average day emissions were provided for the same process and pollutant in the inventory, the winter day value was included in the SMOKE input file.

The point source inventory contains summer day and winter day emissions. Two sets of SMOKE input files were prepared for point sources as well (one file containing annual and summer day emissions and the other containing annual and winter day emissions).

Table VII-10 provides the unique list of the start date, end date, and emission type combinations for daily emissions in the point and area source inventories that were used to define summer, winter, and average day emissions. This table also shows the names of the SMOKE input files in which the emissions are included.

For onroad sources, daily emissions were calculated by SMOKE using the monthly MOBILE6 input files included in the SMOKE input files.

The nonroad IDA file only has annual total emissions. The values in the "typical day" column are zero. Annual total emissions were allocated for each hour using the monthly, weekly, and diurnal profiles described in Section A.2 of this chapter.

Table VII-1. Profiles, Cross-references, and Documentation for Model Inputs for Version 3 of 2002 MANE-VU Inventory

Description	File Name	Format	Date of File used for Version 3	Size (Bytes)	Notes
SCC descriptions file	scc_desc_manevu.083104.txt	SMOKE	8/31/2004	1,335,524	
Temporal Allocation Profiles					
Technical memo on profile/cross-reference review for area sources	MANE-VU_AreaEI_review_draft_090304.doc	MS Word	9/3/2004	760,320	
Technical memo on profile/cross-reference review for point sources	MANE-VU_PointEI_review_draft_090304.doc	MS Word	9/3/2004	262,144	
Temporal profile cross-reference file for point sources	amptref.m3.manevu.vistascem.032805.txt	SMOKE	3/28/2005	704,998	Based on "amptref.m3.manevu.012405.txt" prepared for Version 1, but added VISTAS BaseD cross-references to the state-specific 2002 continuous emissions monitoring (CEM)-derived point source temporal profiles generated by VISTAS for their BaseD modeling.
Temporal profiles file for point sources	amptpro.m3.us+can.manevu.vistascem.032805.txt	SMOKE	3/28/2005	178,427	Based on "amptpro.m3.us+can.manevu.030205.txt" prepared for Version 1, but added state-specific 2002 CEM-derived point source temporal profiles generated by VISTAS for their BaseD modeling.
Temporal profile cross-reference file for area sources	amptref.m3.manevu.012405.txt	SMOKE	1/24/2005	687,196	
Temporal profiles file for area sources	amptpro.m3.us+can.manevu.030205.txt	SMOKE	3/2/2005	136,131	
Temporal cross-reference file containing state-specific onroad mobile source data for Connecticut, Delaware, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, and Vermont	MANEVU_2002_mtref_02022006_addCT.txt	SMOKE	2/22/2006	2,522,013	Data for Connecticut were added to the file after the file was prepared for the other states. Hence the reason "_addCT" is included at the end of the file name.

Table VII-1 (continued)

Description	File Name	Format	Date of File used for Version 3	Size (Bytes)	Notes
Temporal profiles file containing state-specific onroad mobile source data for Connecticut, Delaware, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, and Vermont	MANEVU_2002_mtpro_02022006_addCT.txt	SMOKE	2/22/2006	23,122	Data for Connecticut were added to the file after the file was prepared for the other states. Hence the reason "_addCT" is included at the end of the file name.
Spatial/Gridding					
Spreadsheet summary generated for area source gridding review	MANE-VU_agref_review.xls		8/31/2004	1,607,680	
Spatial profile cross-reference file	amgref.m3.us+can+mex.manevu.082404.txt	SMOKE	8/31/2004	89,860	
Gridding surrogate cross-reference file	amgref_us_051704_manevu_added	SMOKE	5/17/2004	35,825	Based on the surrogate cross-reference file downloaded from the EPA/CHIEF site that corresponds to the gridding surrogates file. However, several MANE-VU-specific additions included in "amgref.m3.us+can+mex.manevu.082404.txt" for Version 1 were added to the gridding-cross reference file downloaded from EPA. These are cross-references for SCCs 2806010000, 2806015000, 2870000011, 2870000015, 2870000021, and 2870000022.
Modeling grid (12-km)	amgpro.12km_041604.otc12.us.txt	SMOKE	4/16/2004	150,689,358	Based on downloaded 12-km EPA gridding surrogates windowed for the OTC domain
Speciation Profiles					
Spreadsheet summary generated for area source speciation review	MANE-VU_asref_review.xls	Excel	8/31/2004	5,626,880	
Speciation profiles file for CB-IV	gspro.cmaq.cb4p25.txt	SMOKE		142,255	
Speciation cross-reference file for CB-IV	gsref.cmaq.cb4p25.manevu.083104.txt	SMOKE	8/31/2004	786,998	

Table VII-1 (continued)

Description	File Name	Format	Date of File used for Version 3	Size (Bytes)	Notes
Speciation profile cross-reference assignment file	gsref.cmaq.cb4p25.txt	SMOKE	2/1/2005	754,302	This file is based on the file "gsref.cmaq.cb4p25.manevu.083104.txt" prepared for version 1 of the MANE-VU inventory. The only revision was to change the PM2_5 speciation profile # from its default 99999 to 35501 for some mobile source categories. This update had been done by either CENRAP or VISTAS in the speciation profiles they provided and the update had a more recent creation date than the MANE-VU files created for Version 1, so this appeared to be a refinement.
Speciation profiles for REMSAD7	gspro.remsad7.cb4mpm.txt_tag	SMOKE	5/1/2005	532,990	Based on "gspro.remsad7.cb4mpm.txt" in the SMOKE, but added tagged species for REMSAD state-level sulfur tagging.
Speciation cross-reference for REMSAD7	gsref.remsad7.cb4mpm.txt_tag	SMOKE	5/1/2005	2,614,360	Based on "gsref.remsad7.cb4mpm.txt" in the SMOKE, but added tagged species for REMSAD state-level sulfur tagging.
Transport fractions for fugitive dust	gcntl.xportfrac.txt	SMOKE	2/1/2004	124,495	File obtained from input file EPA used to adjust for PM transport for modeling of Clean Air Interstate Rule (CAIR).

Table VII-2. Point Source Temporal Cross-reference Additions

State	FIPS	SCC	Recommended profiles			Method of assignment	SCC Description (Complete description not always available)
			Monthly	Weekly	Diurnal		
VT	50005	10200908	262	7	24	Use SCC=102009XX profiles	External Combustion Boilers;Industrial;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture)
VT	50019	10200908	262	7	24	Use SCC=102009XX profiles	External Combustion Boilers;Industrial;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture)
VT	50021	10200908	262	7	24	Use SCC=102009XX profiles	External Combustion Boilers;Industrial;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture)
VT	50017	10300908	262	7	24	Use SCC=103009XX profiles	External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture)
PA	42009	20200299	262	7	24	Use SCC=202002XX profiles	Internal Combustion Engines;Industrial;Natural Gas;Unknown
PA	42029	20200299	262	7	24	Use SCC=202002XX profiles	Internal Combustion Engines;Industrial;Natural Gas;Unknown
PA	42045	20200299	262	7	24	Use SCC=202002XX profiles	Internal Combustion Engines;Industrial;Natural Gas;Unknown
PA	42061	20200299	262	7	24	Use SCC=202002XX profiles	Internal Combustion Engines;Industrial;Natural Gas;Unknown
PA	42067	20200299	262	7	24	Use SCC=202002XX profiles	Internal Combustion Engines;Industrial;Natural Gas;Unknown
PA	42015	20300299	262	7	24	Use SCC=203002XX profiles	Internal Combustion Engines;Commercial/Institutional;Natural Gas;Unknown
PA	42029	20300299	262	7	24	Use SCC=203002XX profiles	Internal Combustion Engines;Commercial/Institutional;Natural Gas;Unknown
PA	42037	20300299	262	7	24	Use SCC=203002XX profiles	Internal Combustion Engines;Commercial/Institutional;Natural Gas;Unknown
PA	42071	20300299	262	7	24	Use SCC=203002XX profiles	Internal Combustion Engines;Commercial/Institutional;Natural Gas;Unknown
PA	42011	28888899	262	7	24	Use SCC=288888XX profiles	Internal Combustion Engines;Fugitive Emissions;Other Not Classified;Specify in Comments
PA	42123	28888899	262	7	24	Use SCC=288888XX profiles	Internal Combustion Engines;Fugitive Emissions;Other Not Classified;Specify in Comments
PA	42123	28888899	262	7	24	Use SCC=288888XX profiles	Internal Combustion Engines;Fugitive Emissions;Other Not Classified;Specify in Comments
PA	42129	28888899	262	7	24	Use SCC=288888XX profiles	Internal Combustion Engines;Fugitive Emissions;Other Not Classified;Specify in Comments
MD	24031	30500261	262	7	24	Use SCC=30500260 profile	Industrial Processes;Mineral Products;Asphalt Concrete;Drum Mix Plant: Rotary Drum Dryer/Mixer, Waste/Drain/#6 Oil-Fired

Table VII-2 (continued)

State	FIPS	SCC	Recommended profiles			Method of assignment	SCC Description (Complete description not always available)
			Monthly	Weekly	Diurnal		
NY	36055	31603001	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Substrate Preparation;Extrusion Operations
NY	36055	31603002	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Substrate Preparation;Film Support Operations
NY	36055	31604001	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Chemical Preparation;Chemical Manufacturing
NY	36055	31604002	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Chemical Preparation;Emulsion Making Operations
NY	36055	31604003	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Chemical Preparation;Chemical Mixing Operations
NY	36055	31605001	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Surface Treatments;Surface Coating Operations
NY	36055	31605002	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Surface Treatments;Grid Ionizers
NY	36055	31605003	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Surface Treatments;Corona Discharge Treatment
NY	36055	31606001	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Finishing Operations;General Film Manufacturing
NY	36055	31606002	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Finishing Operations;Cutting/Slitting Operations
PA	42101	31606002	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Finishing Operations;Cutting/Slitting Operations
NY	36055	31612001	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Support Activities - Cleaning Operations;Tank Cleaning Operations
NY	36055	31612002	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Support Activities - Cleaning Operations;General Cleaning Operations
NY	36055	31613002	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Support Activities - Storage Operations;General Storage Operations

Table VII-2 (continued)

State	FIPS	SCC	Recommended profiles			Method of assignment	SCC Description (Complete description not always available)
			Monthly	Weekly	Diurnal		
NY	36055	31614001	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Support Activities - Material Transfer Operations;Filling Operations (non petroleum)
NY	36055	31614002	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Support Activities - Material Transfer Operations;Transfer of Chemicals
NY	36055	31615001	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Support Activities - Separation Processes;Recovery Operations
NY	36055	31615003	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Support Activities - Separation Processes;Distillation Operations
NY	36055	31616002	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Support Activities - Other Operations;General Process Tank Operations
NY	36055	31616003	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Support Activities - Other Operations;Miscellaneous Manufacturing Operations
NY	36055	31616004	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Support Activities - Other Operations;Paint Spraying Operations
NY	36055	31616006	262	7	24	Use SIC=3861 and SIC=2796 as guidance and evaluate specific sources	Industrial Processes;Photographic Film Manufacturing;Support Activities - Other Operations;Chemical Weighing Operations
PA	Numerous counties	39000698	262	7	24	Use SCC=39000699 profile	Industrial Processes;In-process Fuel Use;Natural Gas;Unknown
NJ	Numerous counties	39999901	262	7	24	Use SCC=399999XX profiles	Industrial Processes;Miscellaneous Manufacturing Industries;Miscellaneous Industrial Processes;Unknown
PA	42015	40202598	266	7	16	Use SCC=40202599 profile	Petroleum and Solvent Evaporation;Surface Coating Operations;Miscellaneous Metal Parts;Unknown
PA	42017	40202598	266	7	16	Use SCC=40202599 profile	Petroleum and Solvent Evaporation;Surface Coating Operations;Miscellaneous Metal Parts;Unknown
PA	42091	40202598	266	7	16	Use SCC=40202599 profile	Petroleum and Solvent Evaporation;Surface Coating Operations;Miscellaneous Metal Parts;Unknown
PA	42095	40202598	266	7	16	Use SCC=40202599 profile	Petroleum and Solvent Evaporation;Surface Coating Operations;Miscellaneous Metal Parts;Unknown
PA	42097	40202598	266	7	16	Use SCC=40202599 profile	Petroleum and Solvent Evaporation;Surface Coating Operations;Miscellaneous Metal Parts;Unknown
PA	42013	40400299	262	7	24	Use SCC=404002XX profiles	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Unknown
PA	42041	40400299	262	7	24	Use SCC=404002XX profiles	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Unknown

Table VII-2 (continued)

State	FIPS	SCC	Recommended profiles			Method of assignment	SCC Description (Complete description not always available)
			Monthly	Weekly	Diurnal		
PA	42045	40400299	262	7	24	Use SCC=404002XX profiles	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Unknown
PA	42071	40400299	262	7	24	Use SCC=404002XX profiles	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Unknown

Table VII-3. Unknown SCCs in the MANE-VU Point Source Inventory

State	FIPS	SCC	Description
PA	42101	24950002	Need more info: Unknown SCC
PA	42061	40500299	Need more info:Printing/Publishing; General
PA	42091	40500299	Need more info:Printing/Publishing; General
PA	42133	40500299	Need more info:Printing/Publishing; General

Table VII-4. Area Source Temporal Cross-Reference Updates

SCC	SCC description	SMOKE Default profile			New MANE-VU profile		
		Monthly	Weekly	Diurnal	Monthly	Weekly	Diurnal
30502713	Industrial Processes;Mineral Products;Industrial Sand and Gravel;Screening: Size Classification	262	7	24	262	5	12
30502760	Industrial Processes;Mineral Products;Industrial Sand and Gravel;Sand Handling, Transfer, and Storage	262	7	24	262	5	12
2302000000	Industrial Processes;Food and Kindred Products: SIC 20;All Processes;Total	262	7	26	262	7	250
2302050000	Industrial Processes;Food and Kindred Products: SIC 20;Bakery Products;Total	262	7	26	262	5	26
2305000000	Industrial Processes;Mineral Processes: SIC 32;All Processes;Total	262	7	26	262	5	10
2309100010	Industrial Processes;Fabricated Metals: SIC 34;Coating, Engraving, and Allied Services;Electroplating	262	7	26	262	5	10
2311010000	Industrial Processes;Construction: SIC 15 - 17;General Building Construction;Total	262	7	26	262	5	12
2311020000	Industrial Processes;Construction: SIC 15 - 17;Heavy Construction;Total	262	7	26	262	5	12
2311030000	Industrial Processes;Construction: SIC 15 - 17;Road Construction;Total	262	7	26	262	5	12
2325000000	Industrial Processes;Mining and Quarrying: SIC 14;All Processes;Total	262	7	26	262	5	10
2399000000	Industrial Processes;Industrial Processes: NEC;Industrial Processes: NEC;Total	262	7	26	262	5	10
2399010000	Industrial Processes; Industrial Refrigeration; Refrigerant Losses; All Processes	262	7	26	262	5	10
2401015000	Solvent Utilization;Surface Coating;Factory Finished Wood: SIC 2426 thru 242;Total: All Solvent Types	173	7	26	173	5	26
2401020000	Solvent Utilization;Surface Coating;Wood Furniture: SIC 25;Total: All Solvent Types	287	7	26	287	5	26
2401025000	Solvent Utilization;Surface Coating;Metal Furniture: SIC 25;Total: All Solvent Types	287	7	26	287	5	26
2401030000	Solvent Utilization;Surface Coating;Paper: SIC 26;Total: All Solvent Types	257	7	26	257	5	26
2401040000	Solvent Utilization;Surface Coating;Metal Cans: SIC 341;Total: All Solvent Types	253	7	26	253	5	26
2401045000	Solvent Utilization;Surface Coating;Metal Coils: SIC 3498;Total: All Solvent Types	253	7	26	253	5	26
2401050000	Solvent Utilization;Surface Coating;Miscellaneous Finished Metals: SIC 34 - (341 + 3498);Total: All Solvent Types	253	7	26	253	5	26

Table VII-4 (continued)

SCC	SCC description	SMOKE Default profile			New MANE-VU profile		
		Monthly	Weekly	Diurnal	Monthly	Weekly	Diurnal
2401055000	Solvent Utilization;Surface Coating;Machinery and Equipment: SIC 35;Total: All Solvent Types	253	7	26	253	5	26
2401060000	Solvent Utilization;Surface Coating;Large Appliances: SIC 363;Total: All Solvent Types	262	7	26	262	5	26
2401065000	Solvent Utilization;Surface Coating;Electronic and Other Electrical: SIC 36 - 363;Total: All Solvent Types	253	7	26	253	5	26
2401070000	Solvent Utilization;Surface Coating;Motor Vehicles: SIC 371;Total: All Solvent Types	140	7	26	140	5	26
2401075000	Solvent Utilization;Surface Coating;Aircraft: SIC 372;Total: All Solvent Types	169	7	26	169	5	26
2401080000	Solvent Utilization;Surface Coating;Marine: SIC 373;Total: All Solvent Types	266	7	26	266	5	26
2401085000	Solvent Utilization;Surface Coating;Railroad: SIC 374;Total: All Solvent Types	169	7	26	169	5	26
2401090000	Solvent Utilization;Surface Coating;Miscellaneous Manufacturing;Total: All Solvent Types	260	7	26	260	5	26
2401090999	Solvent Utilization;Surface Coating;Miscellaneous Manufacturing;Solvents: NEC	260	7	26	260	5	26
2401200000	Solvent Utilization;Surface Coating;Other Special Purpose Coatings;Total: All Solvent Types	260	7	26	260	5	26
2401990000	Solvent Utilization;Surface Coating;All Surface Coating Categories;Total: All Solvent Types	260	7	26	260	5	26
2401990999	Solvent Utilization;Surface Coating;All Surface Coating Categories;Solvents: NEC	260	7	26	260	5	26
2415000000	Solvent Utilization;Degreasing;All Processes/All Industries;Total: All Solvent Types	253	7	26	253	5	26
2415020000	Solvent Utilization;Degreasing;Fabricated Metal Products (SIC 34): All Processes;Total: All Solvent Types	253	7	26	253	5	12
2415025000	Solvent Utilization;Degreasing;Industrial Machinery and Equipment (SIC 35): All Processes;Total: All Solvent Types	253	7	26	253	5	12
2415030000	Solvent Utilization;Degreasing;Electronic and Other Elec. (SIC 36): All Processes;Total: All Solvent Types	253	7	26	253	5	12
2415035000	Solvent Utilization;Degreasing;Transportation Equipment (SIC 37): All Processes;Total: All Solvent Types	253	7	26	253	5	12
2415045000	Solvent Utilization;Degreasing;Miscellaneous Manufacturing (SIC 39): All Processes;Total: All Solvent Types	253	7	26	253	5	12
2415055000	Solvent Utilization;Degreasing;Automotive Dealers (SIC 55): All Processes;Total: All Solvent Types	253	7	26	253	5	12
2415060000	Solvent Utilization;Degreasing;Miscellaneous Repair Services (SIC 76): All Processes;Total: All Solvent Types	253	7	26	253	5	12

Table VII-4 (continued)

SCC	SCC description	SMOKE Default profile			New MANE-VU profile		
		Monthly	Weekly	Diurnal	Monthly	Weekly	Diurnal
2415065000	Solvent Utilization;Degreasing;Auto Repair Services (SIC 75): All Processes;Total: All Solvent Types	253	7	26	253	6	12
2415100000	Solvent Utilization;Degreasing;All Industries: Open Top Degreasing;Total: All Solvent Types	253	7	26	253	5	12
2415105000	Solvent Utilization;Degreasing;Furniture and Fixtures (SIC 25): Open Top Degreasing;Total: All Solvent Types	253	7	26	253	5	12
2415110000	Solvent Utilization;Degreasing;Primary Metal Industries (SIC 33): Open Top Degreasing;Total: All Solvent Types	253	7	26	253	5	12
2415120000	Solvent Utilization;Degreasing;Fabricated Metal Products (SIC 34): Open Top Degreasing;Total: All Solvent Types	253	7	26	253	5	12
2415125000	Solvent Utilization;Degreasing;Industrial Machinery and Equipment (SIC 35): Open Top Degreasing;Total: All Solvent Types	253	7	26	253	5	12
2415130000	Solvent Utilization;Degreasing;Electronic and Other Elec. (SIC 36): Open Top Degreasing;Total: All Solvent Types	253	7	26	253	5	12
2415135000	Solvent Utilization;Degreasing;Transportation Equipment (SIC 37): Open Top Degreasing;Total: All Solvent Types	253	7	26	253	5	12
2415140000	Solvent Utilization;Degreasing;Instruments and Related Products (SIC 38): Open Top Degreasing;Total: All Solvent Types	253	7	26	253	5	12
2415145000	Solvent Utilization;Degreasing;Miscellaneous Manufacturing (SIC 39): Open Top Degreasing;Total: All Solvent Types	253	7	26	253	5	12
2415200000	Solvent Utilization;Degreasing;All Industries: Conveyerized Degreasing;Total: All Solvent Types	253	7	26	253	5	12
2415230000	Solvent Utilization;Degreasing;Electronic and Other Elec. (SIC 36): Conveyerized Degreasing;Total: All Solvent Types	253	7	26	253	5	12
2415300000	Solvent Utilization;Degreasing;All Industries: Cold Cleaning;Total: All Solvent Types	253	7	26	253	5	12
2415305000	Solvent Utilization;Degreasing;Furniture and Fixtures (SIC 25): Cold Cleaning;Total: All Solvent Types	253	7	26	253	5	12
2415310000	Solvent Utilization;Degreasing;Primary Metal Industries (SIC 33): Cold Cleaning;Total: All Solvent Types	253	7	26	253	5	12
2415320000	Solvent Utilization;Degreasing;Fabricated Metal Products (SIC 34): Cold Cleaning;Total: All Solvent Types	253	7	26	253	5	12
2415325000	Solvent Utilization;Degreasing;Industrial Machinery and Equipment (SIC 35): Cold Cleaning;Total: All Solvent Types	253	7	26	253	5	12
2415330000	Solvent Utilization;Degreasing;Electronic and Other Elec. (SIC 36): Cold Cleaning;Total: All Solvent Types	253	7	26	253	5	12

Table VII-4 (continued)

SCC	SCC description	SMOKE Default profile			New MANE-VU profile		
		Monthly	Weekly	Diurnal	Monthly	Weekly	Diurnal
2415335000	Solvent Utilization;Degreasing;Transportation Equipment (SIC 37): Cold Cleaning;Total: All Solvent Types	253	7	26	253	5	12
2415340000	Solvent Utilization;Degreasing;Instruments and Related Products (SIC 38): Cold Cleaning;Total: All Solvent Types	253	7	26	253	5	12
2415345000	Solvent Utilization;Degreasing;Miscellaneous Manufacturing (SIC 39): Cold Cleaning;Total: All Solvent Types	253	7	26	253	5	12
2415355000	Solvent Utilization;Degreasing;Automotive Dealers (SIC 55): Cold Cleaning;Total: All Solvent Types	253	7	26	253	5	12
2415360000	Solvent Utilization;Degreasing;Auto Repair Services (SIC 75): Cold Cleaning;Total: All Solvent Types	253	7	26	253	6	12
2415365000	Solvent Utilization;Degreasing;Miscellaneous Repair Services (SIC 76): Cold Cleaning;Total: All Solvent Types	253	7	26	253	5	12
2425000000	Solvent Utilization;Graphic Arts;All Processes;Total: All Solvent Types	257	7	26	257	5	26
2425010000	Solvent Utilization;Graphic Arts;Lithography;Total: All Solvent Types	257	7	26	257	5	26
2425020000	Solvent Utilization;Graphic Arts;Letterpress;Total: All Solvent Types	257	7	26	257	5	26
2425030000	Solvent Utilization;Graphic Arts;Rotogravure;Total: All Solvent Types	262	7	26	262	5	26
2425040000	Solvent Utilization;Graphic Arts;Flexography;Total: All Solvent Types	257	7	26	257	5	26
2430000000	Solvent Utilization;Rubber/Plastics;All Processes;Total: All Solvent Types	200	7	26	200	5	26
2601010000	Waste Disposal, Treatment, and Recovery;On-site Incineration;Industrial;Total	262	7	26	262	5	12
2601020000	Waste Disposal, Treatment, and Recovery;On-site Incineration;Commercial/Institutional;Total	262	7	26	262	5	12
2610010000	Waste Disposal, Treatment, and Recovery;Open Burning;Industrial;Total	262	7	26	262	5	12
2610020000	Waste Disposal, Treatment, and Recovery;Open Burning;Commercial/Institutional;Total	262	7	26	262	5	12
2805020000	Miscellaneous Area Sources;Agriculture Production - Livestock;Cattle and Calves Waste Emissions;Total	489	7	26	1500	7	26
2805025000	Miscellaneous Area Sources;Agriculture Production - Livestock;Hogs and Pigs Waste Emissions;Total	489	7	26	1500	7	26
2805030000	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry Waste Emissions;Total	489	7	26	1500	7	26

Table VII-4 (continued)

SCC	SCC description	SMOKE Default profile			New MANE-VU profile		
		Monthly	Weekly	Diurnal	Monthly	Weekly	Diurnal
2805035000	Miscellaneous Area Sources;Agriculture Production - Livestock;Horses and Ponies Waste Emissions;Total	262	7	26	1500	7	26
2805040000	Miscellaneous Area Sources;Agriculture Production - Livestock;Sheep and Lambs Waste Emissions;Total	489	7	26	1500	7	26
2805045001	Miscellaneous Area Sources;Agriculture Production - Livestock;Goats Waste Emissions;Total	489	7	26	262	7	24
2810015000	Miscellaneous Area Sources;Other Combustion;Prescribed Burning for Forest Management;Total	14	7	24	3	11	13

Table VII-5. Area Source Temporal Cross-Reference Additions

SCC	Description	Month	Week	Diurnal
2104008002	Stationary Source Fuel Combustion;Residential;Wood;Fireplaces: Insert; non-EPA certified	485	7	26
2104008003	Stationary Source Fuel Combustion;Residential;Wood;Fireplaces: Insert; EPA certified; non-catalytic	485	7	26
2104008004	Stationary Source Fuel Combustion;Residential;Wood;Fireplaces: Insert; EPA certified; catalytic	485	7	26
2302002100	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Charbroiling;Conveyorized Charbroiling	262	7	26
2302002200	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Charbroiling;Under-fired Charbroiling	262	7	26
2302003000	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Deep Fat Frying;Total	262	7	26
2302003100	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Deep Fat Frying;Flat Griddle Frying	262	7	26
2302003200	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Deep Fat Frying;Clamshell Griddle Frying	262	7	26
2302080002	Industrial Processes;Food and Kindred Products: SIC 20;Miscellaneous Food and Kindred Products;Refrigeration	262	7	26
2401002000	Solvent Utilization;Surface Coating;Architectural Coatings - Solvent-based;Total: All Solvent Types	467	7	26
2401003000	Solvent Utilization;Surface Coating;Architectural Coatings - Water-based;Total: All Solvent Types	467	7	26
2401102000	Solvent Utilization;Surface Coating;Industrial Maintenance Coatings-Solvent-based;Total: All Solvent Types	500	5	26
2401103000	Solvent Utilization;Surface Coating;Industrial Maintenance Coatings-Water-based;Total: All Solvent Types	500	5	26
2415270000	Solvent Utilization;Degreasing;All Manufacturing (except SIC 36): Vapor and In-Line Cleaning;Total: All Solvent Types	253	5	12
2415280000	Solvent Utilization;Degreasing;Electronic and Other Elec. (SIC 36): Vapor and In-Line Cleaning;Total: All Solvent Types	253	5	12
2415370000	Solvent Utilization;Degreasing;Transportation Equipment Repair Services: Cold Cleaning;Total: All Solvent Types	253	5	12
2415380000	Solvent Utilization;Degreasing;All Manufacturing: Cold Cleaning;Total: All Solvent Types	253	5	12
2610000400	Waste Disposal, Treatment, and Recovery;Open Burning;All Categories;Yard Waste - Brush Species Unspecified	262	7	26
2610000500	Waste Disposal, Treatment, and Recovery;Open Burning;All Categories;Land Clearing Debris (use 28-10-005-000 for Logging Debris Burning)	262	7	26
2610040400	Waste Disposal, Treatment, and Recovery;Open Burning;Municipal (collected from residences, parks,other for central burn);Yard Waste - Total	262	7	26
2630020010	Waste Disposal, Treatment, and Recovery;Wastewater Treatment;Public Owned;Wastewater Treatment Processes Total	262	7	24

Table VII-5 (continued)

SCC	Description	Month	Week	Diurnal
2630020020	Waste Disposal, Treatment, and Recovery;Wastewater Treatment;Public Owned;Biosolids Processes Total	262	7	24
2630020030	Waste Disposal, Treatment, and Recovery;Wastewater Treatment;Public Owned;Land Application - Digested Sludge	262	7	24
2630050000	Waste Disposal, Treatment, and Recovery;Wastewater Treatment;Public Owned;Land Application - Digested Sludge	262	7	24
2680001000	Waste Disposal, Treatment, and Recovery;Composting;100% Biosolids (e.g., sewage sludge, manure, mixtures of these matls);All Processes	262	7	26
2680002000	Waste Disposal, Treatment, and Recovery;Composting;Mixed Waste (e.g., a 50:50 mixture of biosolids and green wastes);All Processes	262	7	26
2801700011	Miscellaneous Area Sources;Agriculture Production - Crops;Fertilizer Application;Calcium Ammonium Nitrate	998	7	26
2801700012	Miscellaneous Area Sources;Agriculture Production - Crops;Fertilizer Application;Potassium Nitrate	998	7	26
2801700013	Miscellaneous Area Sources;Agriculture Production - Crops;Fertilizer Application;Diammonium Phosphate	998	7	26
2801700014	Miscellaneous Area Sources;Agriculture Production - Crops;Fertilizer Application;Monoammonium Phosphate	998	7	26
2801700015	Miscellaneous Area Sources;Agriculture Production - Crops;Fertilizer Application;Liquid Ammonium Polyphosphate	998	7	26
2801700099	Miscellaneous Area Sources;Agriculture Production - Crops;Fertilizer Application;Miscellaneous Fertilizers	998	7	26
2805001100	Miscellaneous Area Sources;Agriculture Production - Livestock;Beef cattle - finishing operations on feedlots (drylots);Confinement	1500	7	26
2805001200	Miscellaneous Area Sources;Agriculture Production - Livestock;Beef cattle - finishing operations on feedlots (drylots);Manure handling and storage	1500	7	26
2805001300	Miscellaneous Area Sources;Agriculture Production - Livestock;Beef cattle - finishing operations on feedlots (drylots);Land application of manure	1500	7	26
2805002000	Miscellaneous Area Sources;Agriculture Production - Livestock;Beef Cattle Composite; Not Elsewhere Classified	1500	7	26
2805003100	Miscellaneous Area Sources;Agriculture Production - Livestock;Beef cattle - finishing operations on pasture/range;Confinement	1500	7	26
2805007100	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - layers with dry manure management systems;Confinement	1500	7	26
2805007200	Miscellaneous Area Sources;Agricultural Production - Livestock;Poultry Production - layers with dry manure management systems;Management	1500	7	26
2805007300	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - layers with dry manure management systems;Land application of manure	262	7	24
2805007330	Miscellaneous Area Sources;Agricultural Production - Livestock;Poultry Production - layers with dry manure management systems; Land application	1500	7	26
2805007340	Miscellaneous Area Sources;Agricultural Production - Livestock;Poultry Production - layers with dry manure management systems; Land application	1500	7	26

Table VII-5 (continued)

SCC	Description	Month	Week	Diurnal
2805008100	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - layers with wet manure management systems;Confinement	1500	7	26
2805008200	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - layers with wet manure management systems;Manure handling and storage	1500	7	26
2805008300	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - layers with wet manure management systems;Land application of manure	1500	7	26
2805009100	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - broilers;Confinement	1500	7	26
2805009300	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - broilers;Land application of manure	1500	7	26
2805010100	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - turkeys;Confinement	262	7	24
2805010200	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - turkeys;Manure handling and storage	262	7	24
2805010300	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - turkeys;Land application of manure	1500	7	26
2805018000	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle composite; Not Elsewhere Classified	1501	7	26
2805019100	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - flush dairy;Confinement	1500	7	26
2805019200	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - flush dairy;Manure handling and storage	1500	7	26
2805019300	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - flush dairy;Land application of manure	1500	7	26
2805020001	Miscellaneous Area Sources;Agriculture Production - Livestock;Cattle and Calves Waste Emissions;Milk Cows	1500	7	26
2805020002	Miscellaneous Area Sources;Agriculture Production - Livestock;Cattle and Calves Waste Emissions;Beef Cows	1500	7	26
2805020003	Miscellaneous Area Sources;Agriculture Production - Livestock;Cattle and Calves Waste Emissions;Heifers and Heifer Calves	1500	7	26
2805021300	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - scrape dairy;Land application of manure	1500	7	26
2805022100	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - deep pit dairy;Confinement	1500	7	26
2805022200	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - deep pit dairy;Manure handling and storage	1500	7	26
2805022300	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - deep pit dairy;Land application of manure	1500	7	26
2805023300	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - drylot/pasture dairy;Land application of manure	1500	7	26
2805030001	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry Waste Emissions;Pullet Chicks and Pullets less than 13 weeks old	1500	7	26

Table VII-5 (continued)

SCC	Description	Month	Week	Diurnal
2805030002	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry Waste Emissions;Pullets 13 weeks old and older but less than 20 weeks	1500	7	26
2805030003	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry Waste Emissions;Layers	1500	7	26
2805030004	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry Waste Emissions;Broilers	1500	7	26
2805030008	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry Waste Emissions;Geese	1500	7	26
2805039100	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - operations with lagoons;Confinement	1500	7	26
2805039200	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - operations with lagoons;Manure handling and storage	1500	7	26
2805039300	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - operations with lagoons;Land application of manure	1500	7	26
2805045000	Miscellaneous Area Sources;Agriculture Production - Livestock;Goats Waste Emissions;Not Elsewhere Classified	1500	7	26
2805045002	Miscellaneous Area Sources;Agriculture Production - Livestock;Goats Waste Emissions;Angora Goats	1500	7	26
2805045003	Miscellaneous Area Sources;Agriculture Production - Livestock;Goats Waste Emissions;Milk Goats	1500	7	26
2805047100	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - deep-pit house operations;Confinement	1500	7	26
2805047300	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - deep-pit house operations;Land application of manure	1500	7	26
2805053100	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - outdoor operations; Confinement	1500	7	26
2805054000	Miscellaneous Area Sources;Agricultural Production - Livestock;"Mules; Donkeys; and Burros Waste Emissions";Not Elsewhere Classified	262	7	24
2806010000	Miscellaneous Area Sources;Domestic Animals Waste Emissions;Cats;Total	262	7	24
2806015000	Miscellaneous Area Sources;Domestic Animals Waste Emissions;Dogs;Total	262	7	24
2807020001	Miscellaneous Area Sources;Wild Animals Waste Emissions;Bears;Black Bears	262	7	26
2807020002	Miscellaneous Area Sources;Wild Animals Waste Emissions;Bears;Grizzly Bears	262	7	26
2807025000	Miscellaneous Area Sources;Wild Animals Waste Emissions;Elk;Total	262	7	26
2807030000	Miscellaneous Area Sources;Wild Animals Waste Emissions;Deer;Total	262	7	26
2807040000	Miscellaneous Area Sources;Wild Animals Waste Emissions;Birds;Total	262	7	26
2810060100	Miscellaneous Area Sources;Other Combustion;Cremation;Humans	262	7	24
2870000001	Miscellaneous Area Sources;Humans;Respiration and Perspiration;Total	262	7	24
2870000002	Miscellaneous Area Sources;Humans;Infant Diapered Waste;Total	262	7	24
2870000011	Miscellaneous Area Sources;Domestic Activity;Household Products;Total	262	7	24

Table VII-5 (continued)

SCC	Description	Month	Week	Diurnal
2870000015	Miscellaneous Area Sources;Domestic Activity;Non-agricultural Fertilizers;Total	3	7	24
2870000021	Miscellaneous Area Sources;Domestic Animals;Dogs;Total	262	7	24
2870000022	Miscellaneous Area Sources;Domestic Animals;Cats;Total	262	7	24
2870000031	Miscellaneous Area Sources;Wild Animals;Deer;Total	262	7	24

Table VII-6. Area Source Temporal Cross-Reference and Profile Additions for the MANE-VU Inventory

SCC	Description	Month	Week	Diurnal	FIPS
2102002000	Stationary Source Fuel Combustion;Industrial;Bituminous/Subbituminous Coal;Total: All Boiler Types	1726	8	26	10000
2102006000	Stationary Source Fuel Combustion;Industrial;Natural Gas;Total: Boilers and IC Engines	1727	8	26	10000
2102007000	Stationary Source Fuel Combustion;Industrial;Liquified Petroleum Gas (LPG);Total: All Boiler Types	1727	8	26	10000
2103001000	Stationary Source Fuel Combustion;Commercial/Institutional;Anthracite Coal;Total: All Boiler Types	1720	8	26	10000
2103004000	Stationary Source Fuel Combustion;Commercial/Institutional;Distillate Oil;Total: Boilers and IC Engines	1721	8	26	10000
2103006000	Stationary Source Fuel Combustion;Commercial/Institutional;Natural Gas;Total: Boilers and IC Engines	1722	8	26	10000
2103007000	Stationary Source Fuel Combustion;Commercial/Institutional;Liquified Petroleum Gas (LPG);Total: All Combustor Types	1723	8	26	10000
2104002000	Stationary Source Fuel Combustion;Residential;Bituminous/Subbituminous Coal;Total: All Combustor Types	1732	7	26	10000
2104004000	Stationary Source Fuel Combustion;Residential;Distillate Oil;Total: All Combustor Types	1733	7	26	10000
2104006000	Stationary Source Fuel Combustion;Residential;Natural Gas;Total: All Combustor Types	1734	7	26	10000
2104007000	Stationary Source Fuel Combustion;Residential;Liquified Petroleum Gas (LPG);Total: All Combustor Types	1735	7	26	10000
2104008000	Stationary Source Fuel Combustion;Residential;Wood;Total: Woodstoves and Fireplaces	1740	2007	2014	10001
2104008000	Stationary Source Fuel Combustion;Residential;Wood;Total: Woodstoves and Fireplaces	1741	2008	2015	10003
2104008000	Stationary Source Fuel Combustion;Residential;Wood;Total: Woodstoves and Fireplaces	1742	2009	2016	10005
2104008000	Stationary Source Fuel Combustion;Residential;Wood;Total: Woodstoves and Fireplaces	1742	2009	2016	10005
2104008070	Stationary Source Fuel Combustion;Residential;Wood;Outdoor Wood Burning Equipment;	1743	2010	2017	10001
2104008070	Stationary Source Fuel Combustion;Residential;Wood;Outdoor Wood Burning Equipment;	1744	2011	2017	10003
2104008070	Stationary Source Fuel Combustion;Residential;Wood;Outdoor Wood Burning Equipment;	1745	2012	2017	10005
2104011000	Stationary Source Fuel Combustion;Residential;Kerosene;Total: All Heater Types	1736	7	26	10000
2294000000	Mobile Sources;Paved Roads;All Paved Roads;Total: Fugitives	1729	7	26	10000
2302002100	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Charbroiling;Conveyorized Charbroiling	262	7	26	10000
2302002100	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Charbroiling;Conveyorized Charbroiling	262	7	26	10000
2302002200	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Charbroiling;Under-fired Charbroiling	262	7	26	10000

Table VII-6 (continued)

SCC	Description	Month	Week	Diurnal	FIPS
2302002200	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Charbroiling;Under-fired Charbroiling	262	7	26	10000
2302003000	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Deep Fat Frying;Total	262	7	26	10000
2302003000	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Deep Fat Frying;Total	262	7	26	10000
2302003100	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Deep Fat Frying;Flat Griddle Frying	262	7	26	10000
2302003100	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Deep Fat Frying;Flat Griddle Frying	262	7	26	10000
2302003200	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Deep Fat Frying;Clamshell Griddle Frying	262	7	26	10000
2302003200	Industrial Processes;Food and Kindred Products: SIC 20;Commercial Deep Fat Frying;Clamshell Griddle Frying	262	7	26	10000
2311030000	Industrial Processes;Construction: SIC 15 - 17;Road Construction;Total	262	7	9	10000
2401002000	Solvent Utilization;Surface Coating;Architectural Coatings - Solvent-based;Total: All Solvent Types	467	7	26	-9
2401002000	Solvent Utilization;Surface Coating;Architectural Coatings - Solvent-based;Total: All Solvent Types	500	20	27	10000
2401003000	Solvent Utilization;Surface Coating;Architectural Coatings - Water-based;Total: All Solvent Types	467	7	26	-9
2401003000	Solvent Utilization;Surface Coating;Architectural Coatings - Water-based;Total: All Solvent Types	500	20	27	10000
2401005000	Solvent Utilization;Surface Coating;Auto Refinishing: SIC 7532;Total: All Solvent Types	1702	5	27	10000
2401005500	Solvent Utilization;Surface Coating;Auto Refinishing: SIC 7532;Surface Preparation Solvents	1702	5	27	10000
2401005600	Solvent Utilization;Surface Coating;Auto Refinishing: SIC 7532;Primers	1702	5	27	10000
2401005700	Solvent Utilization;Surface Coating;Auto Refinishing: SIC 7532;Top Coats	1702	5	27	10000
2401005800	Solvent Utilization;Surface Coating;Auto Refinishing: SIC 7532;Clean-up Solvents	1702	5	27	10000
2401005800	Solvent Utilization;Surface Coating;Auto Refinishing: SIC 7532;Clean-up Solvents	1702	5	27	10001
2401008000	Solvent Utilization;Surface Coating;Traffic Markings;Total: All Solvent Types	1700	7	26	-9
2401008000	Solvent Utilization;Surface Coating;Traffic Markings;Total: All Solvent Types	1700	5	26	10000
2401008999	Solvent Utilization;Surface Coating;Traffic Markings;Solvents: NEC	1700	7	26	-9
2401102000	Solvent Utilization;Surface Coating;Industrial Maintenance Coatings-Solvent-based;Total: All Solvent Types	500	5	26	10000
2401103000	Solvent Utilization;Surface Coating;Industrial Maintenance Coatings-Water-based;Total: All Solvent Types	500	5	26	10000
2415100000	Solvent Utilization;Degreasing;All Industries: Open Top Degreasing;Total: All Solvent Types	262	6	5	10000
2415130000	Solvent Utilization;Degreasing;Electronic and Other Elec. (SIC 36): Open Top Degreasing;Total: All Solvent Types	262	6	5	10000
2415300000	Solvent Utilization;Degreasing;All Industries: Cold Cleaning;Total: All Solvent Types	262	6	5	10000
2415360000	Solvent Utilization;Degreasing;Auto Repair Services (SIC 75): Cold Cleaning;Total: All Solvent Types	262	5	5	10000
2461021000	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Cutback Asphalt;Total: All Solvent Types	1712	7	26	10001
2461021000	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Cutback Asphalt;Total: All Solvent Types	1714	7	26	10001
2461021000	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Cutback Asphalt;Total: All Solvent Types	1713	7	26	10003

Table VII-6 (continued)

SCC	Description	Month	Week	Diurnal	FIPS
2461021000	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Cutback Asphalt;Total: All Solvent Types	1712	7	26	10003
2461021000	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Cutback Asphalt;Total: All Solvent Types	1714	7	26	10005
2461021000	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Cutback Asphalt;Total: All Solvent Types	1713	7	26	10005
2461022000	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Emulsified Asphalt;Total: All Solvent Types	1709	7	26	10001
2461022000	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Emulsified Asphalt;Total: All Solvent Types	1711	7	26	10001
2461022000	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Emulsified Asphalt;Total: All Solvent Types	1710	7	26	10003
2461022000	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Emulsified Asphalt;Total: All Solvent Types	1709	7	26	10003
2461022000	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Emulsified Asphalt;Total: All Solvent Types	1711	7	26	10005
2461022000	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Emulsified Asphalt;Total: All Solvent Types	1710	7	26	10005
2461850001	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Pesticide Application: Agricultural;Herbicides, Corn	536	7	26	10000
2461850005	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Pesticide Application: Agricultural;Herbicides, Soy Beans	536	7	26	10000
2461850006	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Pesticide Application: Agricultural;Herbicides, Hay & Grains	536	7	26	10000
2461850051	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Pesticide Application: Agricultural;Other Pesticides, Corn	536	7	26	10000
2461850055	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Pesticide Application: Agricultural;Other Pesticides, Soy Beans	536	7	26	10000
2461850056	Solvent Utilization;Miscellaneous Non-industrial: Commercial;Pesticide Application: Agricultural;Other Pesticides, Hay & Grains	536	7	26	10000
2501011010	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Residential;Vapor Losses	1701	7	26	10000
2501011010	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Residential;Vapor Losses	1701	7	26	10000
2501011011	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Residential;Permeation	1701	7	26	10000
2501011011	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Residential;Permeation	1701	7	26	10000
2501011012	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Residential;Diurnal	1701	7	26	10000
2501011012	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Residential;Diurnal	1701	7	26	10000
2501011015	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Residential;Spillage	1701	7	26	10000
2501011015	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Residential;Spillage	1701	7	26	10000
2501011016	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Residential;Transport	1701	7	26	10000
2501011016	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Residential;Transport	1701	7	26	10000
2501012010	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Commercial;Vapor Losses	1701	7	26	10000
2501012010	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Commercial;Vapor Losses	1701	7	26	10000

Table VII-6 (continued)

SCC	Description	Month	Week	Diurnal	FIPS
2501012011	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Commercial;Permeation	1701	7	26	10000
2501012011	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Commercial;Permeation	1701	7	26	10000
2501012012	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Commercial;Diurnal	1701	7	26	10000
2501012012	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Commercial;Diurnal	1701	7	26	10000
2501012015	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Commercial;Spillage	1701	7	26	10000
2501012015	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Commercial;Spillage	1701	7	26	10000
2501012016	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Commercial;Transport	1701	7	26	10000
2501012016	Storage and Transport;Petroleum and Petroleum Product Storage;Portable Containers: Commercial;Transport	1701	7	26	10000
2501060000	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Total: All Gasoline/All Processes	1701	7	26	-9
2501060050	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 1: Total	1701	7	26	-9
2501060051	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 1: Submerged Filling	1701	7	26	-9
2501060052	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 1: Splash Filling	1701	7	26	-9
2501060053	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 1: Balanced Submerged Filling	1701	7	26	-9
2501060100	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 2: Total	1701	7	26	-9
2501060100	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 2: Total	1724	7	26	10000
2501060101	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 2: Displacement Loss/Uncontrolled	1701	7	26	-9
2501060102	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 2: Displacement Loss/Controlled	1701	7	26	-9
2501060103	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 2: Spillage	1701	7	26	-9
2501060201	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Underground Tank: Breathing and Emptying	1701	7	26	-9
2501060204	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 2: Off-Highway Equipment Displacement Loss/Controlled	1701	7	26	10000
2501060205	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 2: Off-Highway Equipment Spillage	1701	7	26	10000
2501080050	Storage and Transport;Petroleum and Petroleum Product Storage;Airports : Aviation Gasoline;Stage 1: Total	1701	7	26	10000
2501080102	Storage and Transport;Petroleum and Petroleum Product Storage;Airports: Aviation Gasoline;Stage 2: Displacement Loss	1701	7	26	10000
2501080103	Storage and Transport;Petroleum and Petroleum Product Storage;Airports: Aviation Gasoline;Stage 2: Spillage	1701	7	26	10000
2501080201	Storage and Transport;Petroleum and Petroleum Product Storage;Airports: Aviation Gasoline;Underground Tank: Breathing and Emptying	1701	7	26	10000

Table VII-6 (continued)

SCC	Description	Month	Week	Diurnal	FIPS
2501090050	Storage and Transport;Petroleum and Petroleum Product Storage;Airports: Jet A or JP-8;Stage 1: Total	1701	7	26	10000
2501090060	Storage and Transport;Petroleum and Petroleum Product Storage;Airports: Jet A or JP-8;Stage 2: Total	1701	7	26	10000
2501090070	Storage and Transport;Petroleum and Petroleum Product Storage;Airports: Jet Naphtha or JP-4;Stage 1: Total	1701	7	26	10000
2501090080	Storage and Transport;Petroleum and Petroleum Product Storage;Airports: Jet Naphtha or JP-4;Stage 2: Total	1701	7	26	10000
2501090101	Storage and Transport;Petroleum and Petroleum Product Storage;Airports: Jet A or JP-8;Stage 2: Total	1701	7	26	10000
2501090102	Storage and Transport;Petroleum and Petroleum Product Storage;Marinas: Gasoline;Stage 2: Displacement Loss	1701	7	26	10000
2501090103	Storage and Transport;Petroleum and Petroleum Product Storage;Marinas: Gasoline;Stage 2: Spillage	1701	7	26	10000
2501090201	Storage and Transport;Petroleum and Petroleum Product Storage;Marinas: Gasoline;Underground Tank: Emptying and Breathing	1701	7	26	10000
2505000000	Storage and Transport;Petroleum and Petroleum Product Transport;All Transport Types;Total: All Products	1701	7	26	-9
2610010000	Waste Disposal, Treatment, and Recovery;Open Burning;Industrial;Total	262	9	2013	10000
2630020000	Waste Disposal, Treatment, and Recovery;Wastewater Treatment;Public Owned;Total Processed	262	7	24	10000
2630020010	Waste Disposal, Treatment, and Recovery;Wastewater Treatment;Public Owned;Wastewater Treatment Processes Total	262	7	24	10000
2630020020	Waste Disposal, Treatment, and Recovery;Wastewater Treatment;Public Owned;Biosolids Processes Total	262	7	24	10000
2630020030	Waste Disposal, Treatment, and Recovery;Wastewater Treatment;Public Owned;Land Application - Digested Sludge	262	7	24	10000
2630050000	Waste Disposal, Treatment, and Recovery;Wastewater Treatment;Public Owned;Land Application - Digested Sludge	262	7	24	10000
2680001000	Waste Disposal, Treatment, and Recovery;Composting;100% Biosolids (e.g., sewage sludge, manure, mixtures of these matls);All Processes	262	7	26	10000
2730100000	Natural Sources;Geogenic;Wind Erosion;Total	1704	7	26	10000
2801001001	Miscellaneous Area Sources;Agriculture Production - Crops;Corn;Land preparation and cultivation	1703	20	132	10000
2801001005	Miscellaneous Area Sources;Agriculture Production - Crops;Wheat;Land preparation and cultivation	1703	20	132	10000
2801001009	Miscellaneous Area Sources;Agriculture Production - Crops;Barley;Land preparation and cultivation	1703	20	132	10000
2801001013	Miscellaneous Area Sources;Agriculture Production - Crops;Soybeans;Land preparation and cultivation	1703	20	132	10000
2801001017	Miscellaneous Area Sources;Agriculture Production - Crops;Hay/Alfalfa;Land preparation and cultivation	1703	20	132	10000
2801001021	Miscellaneous Area Sources;Agriculture Production - Crops;Vegetables;Land preparation and cultivation	1703	20	132	10000
2801002001	Miscellaneous Area Sources;Agriculture Production - Crops;Corn;Harvesting	1703	20	132	10000
2801002002	Miscellaneous Area Sources;Agriculture Production - Crops;Wheat;Harvesting	1703	20	132	10000
2801002003	Miscellaneous Area Sources;Agriculture Production - Crops;Barley;Harvesting	1703	20	132	10000
2801002004	Miscellaneous Area Sources;Agriculture Production - Crops;Soybeans;Harvesting	1703	20	132	10000
2801002005	Miscellaneous Area Sources;Agriculture Production - Crops;Hay/Alfalfa;Harvesting	1703	20	132	10000
2801002006	Miscellaneous Area Sources;Agriculture Production - Crops;Vegetables;Harvesting	1703	20	132	10000

Table VII-6 (continued)

SCC	Description	Month	Week	Diurnal	FIPS
2801700020	Miscellaneous Area Sources;Agricultural Production - Crops;Fertilizer Application;Corn	1705	7	26	10000
2801700021	Miscellaneous Area Sources;Agricultural Production - Crops;Fertilizer Application;Sorghum	1705	7	26	10000
2801700022	Miscellaneous Area Sources;Agricultural Production - Crops;Fertilizer Application;Wheat	1705	7	26	10000
2801700023	Miscellaneous Area Sources;Agricultural Production - Crops;Fertilizer Application;Barley	1705	7	26	10000
2801700024	Miscellaneous Area Sources;Agricultural Production - Crops;Fertilizer Application;Soybeans	1705	7	26	10000
2801700025	Miscellaneous Area Sources;Agricultural Production - Crops;Fertilizer Application;Hay/Alfalfa	1705	7	26	10000
2801700026	Miscellaneous Area Sources;Agricultural Production - Crops;Fertilizer Application;Vegetables	1705	7	26	10000
2805001100	Miscellaneous Area Sources;Agriculture Production - Livestock;Beef cattle - finishing operations on feedlots (drylots);Confinement	1706	7	24	10000
2805001200	Miscellaneous Area Sources;Agriculture Production - Livestock;Beef cattle - finishing operations on feedlots (drylots);Manure handling	1706	7	24	10000
2805001300	Miscellaneous Area Sources;Agriculture Production - Livestock;Beef cattle - finishing operations on feedlots (drylots);Land application of	1706	7	24	10000
2805001310	Miscellaneous Area Sources;Agricultural Production - Livestock;Beef Cattle - finishing operations on feedlots (drylots);Land Appl	1706	7	24	10000
2805001320	Miscellaneous Area Sources;Agricultural Production - Livestock;Beef Cattle - finishing operations on feedlots (drylots);Land Appl	1706	7	24	10000
2805001330	Miscellaneous Area Sources;Agricultural Production - Livestock;Beef Cattle - finishing operations on feedlots (drylots);Land Appl	1706	7	24	10000
2805001340	Miscellaneous Area Sources;Agricultural Production - Livestock;Beef Cattle - finishing operations on feedlots (drylots);Land Appl	1706	7	24	10000
2805002000	Miscellaneous Area Sources;Agriculture Production - Livestock;Beef Cattle Composite; Total	1706	7	24	10000
2805007100	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - layers with dry manure management systems;Confinement	262	7	24	10000
2805007200	Miscellaneous Area Sources;Agricultural Production - Livestock;Poultry Production - layers with dry manure management systems;Man	262	7	24	10000
2805007300	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - layers with dry manure management systems;Land applicati	262	7	24	10000
2805007340	Miscellaneous Area Sources;Agricultural Production - Livestock;Poultry Production - layers with dry manure management systems;Lan	262	7	24	10000
2805008100	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - layers with wet manure management systems;Confinement	262	7	24	10000
2805008200	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - layers with wet manure management systems;Manure handlin	262	7	24	10000
2805008310	Miscellaneous Area Sources;Agricultural Production - Livestock;Poultry Production - layers with wet manure management systems;Lan	1708	7	24	10000
2805008320	Miscellaneous Area Sources;Agricultural Production - Livestock;Poultry Production - layers with wet manure management systems;Lan	1708	7	24	10000

Table VII-6 (continued)

SCC	Description	Month	Week	Diurnal	FIPS
2805009100	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - broilers;Confinement	262	7	24	10000
2805009200	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - broilers;Manure handling and storage	262	7	24	10000
2805009330	Miscellaneous Area Sources;Agricultural Production - Livestock;Poultry Production - broilers;Land Application of solid manure wit	1708	7	24	10000
2805009340	Miscellaneous Area Sources;Agricultural Production - Livestock;Poultry Production - broilers;Land Application of solid manure wit	1708	7	24	10000
2805010100	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - turkeys;Confinement	262	7	24	10000
2805010200	Miscellaneous Area Sources;Agriculture Production - Livestock;Poultry production - turkeys;Manure handling and storage	262	7	24	10000
2805010330	Miscellaneous Area Sources;Agricultural Production - Livestock;Poultry Production - turkeys;Land Application of solid manure with	1708	7	24	10000
2805010340	Miscellaneous Area Sources;Agricultural Production - Livestock;Poultry Production - turkeys;Land Application of solid manure with	1708	7	24	10000
2805019100	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - flush dairy;Confinement	1706	7	24	10000
2805019200	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - flush dairy;Manure handling and storage	1706	7	24	10000
2805019300	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - flush dairy;Land application of manure	1706	7	24	10000
2805019310	Miscellaneous Area Sources;Agricultural Production - Livestock;Dairy Cattle - flush dairy;Land Application of liquid manure with	1706	7	24	10000
2805019320	Miscellaneous Area Sources;Agricultural Production - Livestock;Dairy Cattle - flush dairy;Land Application of liquid manure witho	1706	7	24	10000
2805019330	Miscellaneous Area Sources;Agricultural Production - Livestock;Dairy Cattle - flush dairy;Land Application of solid manure with i	1706	7	24	10000
2805019340	Miscellaneous Area Sources;Agricultural Production - Livestock;Dairy Cattle - flush dairy;Land Application of solid manure withou	1706	7	24	10000
2805021100	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - scrape dairy;Confinement	1706	7	24	10000
2805021200	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - scrape dairy;Manure handling and storage	1706	7	24	10000
2805021310	Miscellaneous Area Sources;Agricultural Production - Livestock;Dairy Cattle - scrape dairy;Land Application of liquid manure with	1706	7	24	10000
2805021320	Miscellaneous Area Sources;Agricultural Production - Livestock;Dairy Cattle - scrape dairy;Land Application of liquid manure with	1706	7	24	10000
2805021330	Miscellaneous Area Sources;Agricultural Production - Livestock;Dairy Cattle - scrape dairy;Land Application of solid manure with	1706	7	24	10000
2805021340	Miscellaneous Area Sources;Agricultural Production - Livestock;Dairy Cattle - scrape dairy;Land Application of solid manure witho	1706	7	24	10000
2805023100	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - drylot/pasture dairy;Confinement	1706	7	24	10000

Table VII-6 (continued)

SCC	Description	Month	Week	Diurnal	FIPS
2805023200	Miscellaneous Area Sources;Agriculture Production - Livestock;Dairy cattle - drylot/pasture dairy;Manure handling and storage	1706	7	24	10000
2805023310	Miscellaneous Area Sources;Agricultural Production - Livestock;Dairy Cattle - drylot/pasture dairy;Land Application of liquid man	1706	7	24	10000
2805023320	Miscellaneous Area Sources;Agricultural Production - Livestock;Dairy Cattle - drylot/pasture dairy;Land Application of liquid man	1706	7	24	10000
2805023330	Miscellaneous Area Sources;Agricultural Production - Livestock;Dairy Cattle - drylot/pasture dairy;Land Application of solid manu	1706	7	24	10000
2805023340	Miscellaneous Area Sources;Agricultural Production - Livestock;Dairy Cattle - drylot/pasture dairy;Land Application of solid manu	1706	7	24	10000
2805035000	Miscellaneous Area Sources;Agriculture Production - Livestock;Horses and Ponies Waste Emissions;Total	262	7	24	10000
2805038100	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - operations with lagoons (unspecified animal age);Confineme	1707	7	24	10000
2805038200	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - operations with lagoons (unspecified animal age);Manure ha	1707	7	24	10000
2805038300	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - operations with lagoons (unspecified animal age);Land appl	1707	7	24	10000
2805039100	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - operations with lagoons;Confinement	1707	7	24	10000
2805039200	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - operations with lagoons;Manure handling and storage	1707	7	24	10000
2805039310	Miscellaneous Area Sources;Agricultural Production - Livestock;Swine Production - operations with lagoon (unspecified animal age)	1707	7	24	10000
2805039320	Miscellaneous Area Sources;Agricultural Production - Livestock;Swine Production - operations with lagoon (unspecified animal age)	1707	7	24	10000
2805039330	Miscellaneous Area Sources;Agricultural Production - Livestock;Swine Production - operations with lagoon (unspecified animal age)	1707	7	24	10000
2805039340	Miscellaneous Area Sources;Agricultural Production - Livestock;Swine Production - operations with lagoon (unspecified animal age)	1707	7	24	10000
2805040000	Miscellaneous Area Sources;Agriculture Production - Livestock;Sheep and Lambs Waste Emissions;Total	262	7	24	10000
2805045001	Miscellaneous Area Sources;Agriculture Production - Livestock;Goats Waste Emissions;Total	262	7	24	10000
2805046100	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - deep-pit house operations (unspecified animal age);Confine	1707	7	24	10000
2805046300	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - deep-pit house operations (unspecified animal age);Land ap	1707	7	24	10000
2805047100	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - deep-pit house operations;Confinement	1707	7	24	10000
2805047200	Miscellaneous Area Sources;Agricultural Production - Livestock;Swine Production - deep pit house operations (unspecified animal a	1707	7	24	10000

Table VII-6 (continued)

SCC	Description	Month	Week	Diurnal	FIPS
2805047310	Miscellaneous Area Sources;Agricultural Production - Livestock;Swine Production - deep pit house operations (unspecified animal a	1707	7	24	10000
2805047320	Miscellaneous Area Sources;Agricultural Production - Livestock;Swine Production - deep pit house operations (unspecified animal a	1707	7	24	10000
2805047330	Miscellaneous Area Sources;Agricultural Production - Livestock;Swine Production - deep pit house operations (unspecified animal a	1707	7	24	10000
2805047340	Miscellaneous Area Sources;Agricultural Production - Livestock;Swine Production - deep pit house operations (unspecified animal a	1707	7	24	10000
2805052100	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - outdoor operations (unspecified animal age);Confinement	1707	7	24	10000
2805053100	Miscellaneous Area Sources;Agriculture Production - Livestock;Swine production - outdoor operations; Confinement	1707	7	24	10000
2805053200	Miscellaneous Area Sources;Agricultural Production - Livestock;Swine Production - outdoor operations (unspecified animal age);Man	1707	7	24	10000
2805053310	Miscellaneous Area Sources;Agricultural Production - Livestock;Swine Production - outdoor operations (unspecified animal age);Lan	1707	7	24	10000
2805053320	Miscellaneous Area Sources;Agricultural Production - Livestock;Swine Production - outdoor operations (unspecified animal age);Lan	1707	7	24	10000
2805053330	Miscellaneous Area Sources;Agricultural Production - Livestock;Swine Production - outdoor operations (unspecified animal age);Lan	1707	7	24	10000
2805053340	Miscellaneous Area Sources;Agricultural Production - Livestock;Swine Production - outdoor operations (unspecified animal age);Lan	1707	7	24	10000
2805054000	Miscellaneous Area Sources;Agricultural Production - Livestock;"Mules; Donkeys; and Burros Waste Emissions";Not Elsewhere Classif	262	7	24	10000
2806010000	Miscellaneous Area Sources;Domestic Animals Waste Emissions;Cats;Total	262	7	24	10000
2806015000	Miscellaneous Area Sources;Domestic Animals Waste Emissions;Dogs;Total	262	7	24	10000
2807030000	Miscellaneous Area Sources;Wild Animals Waste Emissions;Deer;Total	262	7	24	10000
2807040000	Miscellaneous Area Sources;Wild Animals Waste Emissions;Birds;Total	262	7	24	10000
2810010000	Miscellaneous Area Sources;Other Combustion;Human Perspiration and Respiration;Total	1739	2006	24	10000
2810015000	Miscellaneous Area Sources;Other Combustion;Prescribed Burning for Forest Management;Total	1731	7	24	10000
2810030000	Miscellaneous Area Sources;Other Combustion;Structure Fires;Total	1715	7	24	10000
2810035000	Miscellaneous Area Sources;Other Combustion;Firefighting Training;Total	1716	2004	24	10000
2870000001	Miscellaneous Area Sources;Humans;Respiration and Perspiration;Total	262	7	24	10000
2870000002	Miscellaneous Area Sources;Humans;Infant Diapered Waste;Total	262	7	24	10000
2870000011	Miscellaneous Area Sources;Domestic Activity;Household Products;Total	262	7	24	10000
2870000015	Miscellaneous Area Sources;Domestic Activity;Non-agricultural Fertilizers;Total	3	7	24	10000

Table VII-6 (continued)

SCC	Description	Month	Week	Diurnal	FIPS
2870000021	Miscellaneous Area Sources;Domestic Animals;Dogs;Total	262	7	24	10000
2870000022	Miscellaneous Area Sources;Domestic Animals;Cats;Total	262	7	24	10000
2870000031	Miscellaneous Area Sources;Wild Animals;Deer;Total	262	7	24	10000
2870000032	Miscellaneous Area Sources;Wild Animals;Birds;Total	1728	7	24	10000

Table VII-7. Point Source Speciation Profiles Added to Speciation Cross-reference File for CB-IV with PM Mechanism

State	FIPS	SCC	Recommended Profiles VOC	Recommended Profiles $PM_{2.5}$	Method of Assignment	SCC Description (Complete description not always available)
VT	50005	10200908	1084	NWWAS	Use SCC=102009XX profiles	External Combustion Boilers;Industrial;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture)
VT	50019	10200908	1084	NWWAS	Use SCC=102009XX profiles	External Combustion Boilers;Industrial;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture)
VT	50021	10200908	1084	NWWAS	Use SCC=102009XX profiles	External Combustion Boilers;Industrial;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture)
VT	50017	10300908	1084	NWWAS	Use SCC=103009XX profiles	External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture)
PA	42009	20200299	0007	22004	Use SCC=202002XX profiles	Internal Combustion Engines;Industrial;Natural Gas;Unknown
PA	42029	20200299	0007	22004	Use SCC=202002XX profiles	Internal Combustion Engines;Industrial;Natural Gas;Unknown
PA	42045	20200299	0007	22004	Use SCC=202002XX profiles	Internal Combustion Engines;Industrial;Natural Gas;Unknown
PA	42061	20200299	0007	22004	Use SCC=202002XX profiles	Internal Combustion Engines;Industrial;Natural Gas;Unknown
PA	42067	20200299	0007	22004	Use SCC=202002XX profiles	Internal Combustion Engines;Industrial;Natural Gas;Unknown
PA	42015	20300299	0007	22004	Use SCC=203002XX profiles	Internal Combustion Engines;Commercial/Institutional;Natural Gas;Unknown
PA	42029	20300299	0007	22004	Use SCC=203002XX profiles	Internal Combustion Engines;Commercial/Institutional;Natural Gas;Unknown
PA	42037	20300299	0007	22004	Use SCC=203002XX profiles	Internal Combustion Engines;Commercial/Institutional;Natural Gas;Unknown
PA	42071	20300299	0007	22004	Use SCC=203002XX profiles	Internal Combustion Engines;Commercial/Institutional;Natural Gas;Unknown
PA	42011	28888899	9002	35602	Use SCC=288888XX profiles	Internal Combustion Engines;Fugitive Emissions;Other Not Classified;Specify in Comments
PA	42123	28888899	9002	35602	Use SCC=288888XX profiles	Internal Combustion Engines;Fugitive Emissions;Other Not Classified;Specify in Comments
PA	42123	28888899	9002	35602	Use SCC=288888XX profiles	Internal Combustion Engines;Fugitive Emissions;Other Not Classified;Specify in Comments
PA	42129	28888899	9002	35602	Use SCC=288888XX profiles	Internal Combustion Engines;Fugitive Emissions;Other Not Classified;Specify in Comments
MD	24031	30500261	0025	22035	Use SCC=30500260 profile	Industrial Processes;Mineral Products;Asphalt Concrete;Drum Mix Plant: Rotary Drum Dryer/Mixer, Waste/Drain/#6 Oil-Fired
PA	Numerous counties	39000698	0000	22004	Use SCC=39000699 profile	Industrial Processes;In-process Fuel Use;Natural Gas;Unknown
NJ	Numerous counties	39999901	9003	22054	Use SCC=399999XX profiles	Industrial Processes;Miscellaneous Manufacturing Industries;Miscellaneous Industrial Processes;Unknown
PA	42015	40202598	1003	99999	Use SCC=40202599 profile	Petroleum and Solvent Evaporation;Surface Coating Operations;Miscellaneous Metal Parts;Unknown
PA	42017	40202598	1003	99999	Use SCC=40202599 profile	Petroleum and Solvent Evaporation;Surface Coating Operations;Miscellaneous Metal Parts;Unknown
PA	42091	40202598	1003	99999	Use SCC=40202599 profile	Petroleum and Solvent Evaporation;Surface Coating Operations;Miscellaneous Metal Parts;Unknown
PA	42095	40202598	1003	99999	Use SCC=40202599 profile	Petroleum and Solvent Evaporation;Surface Coating Operations;Miscellaneous Metal Parts;Unknown
PA	42097	40202598	1003	99999	Use SCC=40202599 profile	Petroleum and Solvent Evaporation;Surface Coating Operations;Miscellaneous Metal Parts;Unknown
PA	42013	40400299	1014	22042	Use SCC=404002XX profiles	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Unknown
PA	42041	40400299	1014	22042	Use SCC=404002XX profiles	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Unknown
PA	42045	40400299	1014	22042	Use SCC=404002XX profiles	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Unknown
PA	42071	40400299	1014	22042	Use SCC=404002XX profiles	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Unknown

Table VII-8. Point Source SCCs Lacking Speciation Profile Assignments for CB-IV with PM Mechanism

State	FIPS	SCC	Description
NY	36055	31603001	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Substrate Preparation;Extrusion Operations
NY	36055	31603002	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Substrate Preparation;Film Support Operations
NY	36055	31604001	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Chemical Preparation;Chemical Manufacturing
NY	36055	31604002	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Chemical Preparation;Emulsion Making Operations
NY	36055	31604003	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Chemical Preparation;Chemical Mixing Operations
NY	36055	31605001	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Surface Treatments;Surface Coating Operations
NY	36055	31605002	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Surface Treatments;Grid Ionizers
NY	36055	31605003	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Surface Treatments;Corona Discharge Treatment
NY	36055	31606001	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Finishing Operations;General Film Manufacturing
NY	36055	31606002	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Finishing Operations;Cutting/Slitting Operations
PA	42101	31606002	Industrial Processes;Photographic Film Manufacturing;Product Manufacturing - Finishing Operations;Cutting/Slitting Operations
NY	36055	31612001	Industrial Processes;Photographic Film Manufacturing;Support Activities - Cleaning Operations;Tank Cleaning Operations
NY	36055	31612002	Industrial Processes;Photographic Film Manufacturing;Support Activities - Cleaning Operations;General Cleaning Operations
NY	36055	31613002	Industrial Processes;Photographic Film Manufacturing;Support Activities - Storage Operations;General Storage Operations
NY	36055	31614001	Industrial Processes;Photographic Film Manufacturing;Support Activities - Material Transfer Operations;Filling Operations (non petroleum)
NY	36055	31614002	Industrial Processes;Photographic Film Manufacturing;Support Activities - Material Transfer Operations;Transfer of Chemicals
NY	36055	31615001	Industrial Processes;Photographic Film Manufacturing;Support Activities - Separation Processes;Recovery Operations
NY	36055	31615003	Industrial Processes;Photographic Film Manufacturing;Support Activities - Separation Processes;Distillation Operations
NY	36055	31616002	Industrial Processes;Photographic Film Manufacturing;Support Activities - Other Operations;General Process Tank Operations
NY	36055	31616003	Industrial Processes;Photographic Film Manufacturing;Support Activities - Other Operations;Miscellaneous Manufacturing Operations
NY	36055	31616004	Industrial Processes;Photographic Film Manufacturing;Support Activities - Other Operations;Paint Spraying Operations
NY	36055	31616006	Industrial Processes;Photographic Film Manufacturing;Support Activities - Other Operations;Chemical Weighing Operations

Table VII-9. Summary of Version 3 Mass Emissions and SMOKE Input Files

S/L Agencies Included in Files	NIF 3.0 File Name Containing Mass Emissions Inventory (Access 2000 Database Files)	Temporal Period of Mass Emissions Inventory	SMOKE Input File Name	Temporal Period of Emissions in SMOKE/IDA File
Point Source Inventory				
CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA (state and Philadelphia, and Allegheny Counties), RI, VT	MANEVU_2002_Pt_Version 3_040706.mdb	Annual, Summer Day, and Winter Day	MANEVU_Point_SMOKE_INPUT_ANNUAL_SUMMERDAY_042706.txt	Annual and Summer Day
"	"	"	MANEVU_Point_SMOKE_INPUT_ANNUAL_WINTERDAY_042706.txt	Annual and Winter Day
Area Source Inventory				
CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT	MANEVU_2002_Area_040606.mdb	Annual, Summer Day, Winter Day, and Average Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_SUMMERDAY_040606.txt	Annual, Summer Day, and Average Day
"	"	"	MANEVU_AREA_SMOKE_INPUT_ANNUAL_WINTERDAY_040606.txt	Annual, Winter Day, and Average Day
Nonroad Source Inventory				
CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT	MANEVU_NRD2002_NIF_030306.mdb	Annual	MANEVU_NRD2002_SMOKE_030306.ida	Annual
Onroad Source Inventory				
CT	CT2002MANEVUORCAP_122004.mdb	Annual		
DE	DE2002MANEVUORCAP_072004.mdb	Annual		
DC	DC2002MANEVUORCAP_072004.mdb	Annual		
ME	ME2002MANEVUORCAP_072004.mdb	Annual		
MD	MD2002MANEVUORCAP_072004.mdb	Annual		
MA	MA2002MANEVUORCAP_022006_Access2000.mdb MA2002MANEVUORCAP_022006_Access97.mdb	Annual		
NH	NH2002MANEVUORCAP_072004.mdb	Annual		
NJ	NJ2002MANEVUORCAP_022006_Access2000.mdb NJ2002MANEVUORCAP_022006_Access97.mdb	Annual		
NY	NY2002MANEVUORCAP_072004.mdb	Annual		
PA	PA2002MANEVUORCAP_072004.mdb	Annual		
RI	DRI2002MANEVUORCAP_072004.mdb	Annual		
VT	VT2002MANEVUORCAP_122004.mdb	Annual		
CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT			MANEVU_2002_mbinv_02022006.txt	
CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT			MANEVU_2002_mcref_02022006.txt	

S/L Agencies Included in Files	NIF 3.0 File Name Containing Mass Emissions Inventory (Access 2000 Database Files)	Temporal Period of Mass Emissions Inventory	SMOKE Input File Name	Temporal Period of Emissions in SMOKE/IDA File
DE, MA, MD, NJ, NY, PA, VT			MANEVU_2002_mtpro_02022006.txt	
DE, MA, MD, NJ, NY, PA, VT			MANEVU_2002_mtref_02022006.txt	
CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT			MANEVU_2002_mvref_02022006.txt	
CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT			MANEVU_2002_vmtmix_02022006.txt	
			MANEVU_2002_mcodes.txt	
CT, NY			MANEVU_2002_spdpro.txt	
CT, NY			MANEVU_2002_spdref.txt	
CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT			SMOKE MOBILE6 input files—too numerous to list individually	

Table VII-10. Unique List of Start Date, End Date, and Emission Type Combinations for Daily Emissions in the MANE-VU 2002 Point and Area Source Inventories, Version 3

Start Date	End Date	Emission Type	Emission Type Period	Season Designation	SMOKE File
Point Source Inventory					
20011201	20020228	27	NONANNUAL	Winter	MANEVU_Point_SMOKE_INPUT_ANNUAL_WINTERDAY_042706.txt
20011201	20020228	29	NONANNUAL	Winter	MANEVU_Point_SMOKE_INPUT_ANNUAL_WINTERDAY_042706.txt
20020101	20020331	27	NONANNUAL	Winter	MANEVU_Point_SMOKE_INPUT_ANNUAL_WINTERDAY_042706.txt
20020101	20021231	29	NONANNUAL	MD-Winter	MANEVU_Point_SMOKE_INPUT_ANNUAL_WINTERDAY_042706.txt
				VT-Summer	MANEVU_Point_SMOKE_INPUT_ANNUAL_SUMMERDAY_042706.txt
20020501	20020930	29	NONANNUAL	Summer	MANEVU_Point_SMOKE_INPUT_ANNUAL_SUMMERDAY_042706.txt
20020601	20020831	27	NONANNUAL	Summer	MANEVU_Point_SMOKE_INPUT_ANNUAL_SUMMERDAY_042706.txt
20020601	20020831	29	NONANNUAL	Summer	MANEVU_Point_SMOKE_INPUT_ANNUAL_SUMMERDAY_042706.txt
20020601	20020831	30	NONANNUAL	Summer	MANEVU_Point_SMOKE_INPUT_ANNUAL_SUMMERDAY_042706.txt
Area Source Inventory					
20020101	20020831	27	Daily	Average Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_SUMMERDAY_040606.txt and MANEVU_AREA_SMOKE_INPUT_ANNUAL_WINTERDAY_040606.txt
20020101	20021231	29	Daily	Average Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_SUMMERDAY_040606.txt and MANEVU_AREA_SMOKE_INPUT_ANNUAL_WINTERDAY_040606.txt
20020401	20020930	29	Daily	Summer Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_SUMMERDAY_040606.txt
20020401	20021031	29	Daily	Summer Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_SUMMERDAY_040606.txt
20020512	20020512	27	Daily	Summer Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_SUMMERDAY_040606.txt
20020601	20020831	27	Daily	Summer Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_SUMMERDAY_040606.txt
20020601	20020831	29	Daily	Summer Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_SUMMERDAY_040606.txt
20020601	20020929	29	Daily	Summer Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_SUMMERDAY_040606.txt
20020629	20020629	27	Daily	Summer Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_SUMMERDAY_040606.txt
20011201	20020228	27	Daily	Winter Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_WINTERDAY_040606.txt
20011201	20020228	29	Daily	Winter Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_WINTERDAY_040606.txt
20021029	20021029	27	Daily	Winter Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_WINTERDAY_040606.txt
20021104	20021104	27	Daily	Winter Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_WINTERDAY_040606.txt
20021205	20021205	27	Daily	Winter Day	MANEVU_AREA_SMOKE_INPUT_ANNUAL_WINTERDAY_040606.txt

CHAPTER VIII. METHODS FOR AREAS OUTSIDE OF THE MANE-VU REGION

Figure VIII-1 shows the geographic area for which the 12-kilometer (km) CMAQ modeling domain was used to support air quality modeling for the MANE-VU region. The 36-km domain definition was used for geographical areas outside of the area shown in Figure VIII-1. Table VIII-1 identifies the geographic region as well as the types of emissions inventory and ancillary data used to in modeling for the MANE-VU region. The geographic areas for which data were obtained include the Visibility Improvement State and Tribal Association of the Southeast (VISTAS), Central Regional Air Planning Organization (CENRAP), and WRAP RPOs, the Midwest RPO, Canada, and Mexico.

Figure VIII-1. MANE-VU 12-Kilometer CMAQ Modeling Domain

Table VIII-1. Description of Non-MANE-VU Region Inventory Data Used for MANE-VU BaseB Modeling

Geographical Region/RPO	Raw Data	Time Period and Version Number	Raw Data Format	Source of Data	Source of Ancillary Data	Date Data and Summaries Obtained by MANE-VU Modelers
VISTAS	Point, area, nonroad, and mobile	2002 BaseG	SMOKE IDA	Gregory Stella, Alpine Geophysics	Gregory Stella, Alpine Geophysics	June/July 2006
MRPO	Point, area, nonroad, and mobile	2002 BaseK	SMOKE IDA	NIF files provided by Mark Janssen, MRPO, and converted to IDA format by Gregory Stella, Alpine Geophysics	Part of VISTAS 2002 BaseD provided by Gregory Stella, Alpine Geophysics	May 2006
CENRAP	Point, area, nonroad, and mobile	2002 BaseB	SMOKE IDA	CENRAP ftp site Lee Warden, Oklahoma DEQ	CENRAP ftp site Lee Warden, Oklahoma DEQ	March 2006
WRAP *	Point, area, nonroad, and mobile	Part of VISTAS 2002 BaseD	SMOKE IDA	Part of VISTAS 2002 BaseD provided by Gregory Stella, Alpine Geophysics	Part of VISTAS 2002 BaseD provided by Gregory Stella, Alpine Geophysics	January 2005
Canada	Area, nonroad and mobile	2000	SMOKE IDA	ftp://ftp.epa.gov/EmisInventory/canada_2000inventory	SMOKE 2.1 defaults	February 2005
	Point	2002	SMOKE IDA created by NYSDEC from Canadian NPRI database	http://www.ec.gc.ca/pdb/npri/npri_home_e.cfm	SMOKE 2.1 defaults	May 2005
Mexico *	Point, area, nonroad and mobile	1999	SMOKE IDA	EPA CAIR NODA	SMOKE 2.1 defaults	February 2005

* Only utilized for 2002 BaseA 36-km modeling to generate boundary conditions for BaseA/BaseA1/BaseB current and future year 12-km modeling.

CHAPTER IX. REFERENCES

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APPENDIX A

POINT SOURCE INVENTORY, VERSION 3: DATA SOURCES BY SCC, EMISSION TYPE PERIOD, AND POLLUTANT

[NOTE: The Appendix A table for each State is provided in a separate MS Word file because of the large size of each table. The Word files are provided in the zip file named "Appendix A.zip"; this zip file also includes an Excel Workbook file that contains the spreadsheet from which the Word file was created for each State.]

APPENDIX B

AREA SOURCE INVENTORY, VERSION 3: DATA SOURCES BY SCC, EMISSION TYPE PERIOD, AND POLLUTANT

[NOTE: The Appendix B table for each State is provided in a separate MS Word file because of the large size of each table. The Word files are provided in the zip file named "Appendix B.zip"; this zip file also includes an Excel Workbook file that contains the spreadsheet from which the Word file was created for each State.]

APPENDIX C

NONROAD SOURCE INVENTORY, VERSION 3: FINAL COUNTY, MONTHLY NATIONAL MOBILE INVENTORY MODEL (NMIM) INPUTS

CONTENTS

Table C-1. MANE-VU County, Monthly NMIM/NONROAD Inputs

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
09	**CONNECTICUT**														
RVP, psi															
		001	Fairfield County	12.5	12.5	10.1	10.1	6.8	6.8	6.8	6.8	6.8	10.1	10.1	12.5
		003	Hartford County	12.3	12.3	10.0	10.0	6.9	6.9	6.9	6.9	6.9	10.0	10.0	12.3
		005	Litchfield County	12.3	12.3	10.0	10.0	6.9	6.9	6.9	6.9	6.9	10.0	10.0	12.3
		007	Middlesex County	12.3	12.3	10.0	10.0	6.9	6.9	6.9	6.9	6.9	10.0	10.0	12.3
		009	New Haven County	12.3	12.3	10.0	10.0	6.9	6.9	6.9	6.9	6.9	10.0	10.0	12.3
		011	New London County	12.3	12.3	10.0	10.0	6.9	6.9	6.9	6.9	6.9	10.0	10.0	12.3
		013	Tolland County	12.3	12.3	10.0	10.0	6.9	6.9	6.9	6.9	6.9	10.0	10.0	12.3
		015	Windham County	12.3	12.3	10.0	10.0	6.9	6.9	6.9	6.9	6.9	10.0	10.0	12.3
Oxygen Weight Percent															
		001	Fairfield County	1.7172	1.7172	1.7660	1.7660	1.8234	1.8234	1.8234	1.8234	1.8234	1.7660	1.7660	1.7172
		003	Hartford County	1.5667	1.5667	1.6068	1.6068	1.6596	1.6596	1.6596	1.6596	1.6596	1.6068	1.6068	1.5667
		005	Litchfield County	1.5667	1.5667	1.6068	1.6068	1.6596	1.6596	1.6596	1.6596	1.6596	1.6068	1.6068	1.5667
		007	Middlesex County	1.5667	1.5667	1.6068	1.6068	1.6596	1.6596	1.6596	1.6596	1.6596	1.6068	1.6068	1.5667
		009	New Haven County	1.5667	1.5667	1.6068	1.6068	1.6596	1.6596	1.6596	1.6596	1.6596	1.6068	1.6068	1.5667
		011	New London County	1.5667	1.5667	1.6068	1.6068	1.6596	1.6596	1.6596	1.6596	1.6596	1.6068	1.6068	1.5667
		013	Tolland County	1.5667	1.5667	1.6068	1.6068	1.6596	1.6596	1.6596	1.6596	1.6596	1.6068	1.6068	1.5667
		015	Windham County	1.5667	1.5667	1.6068	1.6068	1.6596	1.6596	1.6596	1.6596	1.6596	1.6068	1.6068	1.5667
Gasoline Sulfur, ppm															
		001	Fairfield County	135.0	135.0	135.0	135.0	106.0	106.0	106.0	106.0	106.0	135.0	135.0	135.0
		003	Hartford County	135.0	135.0	135.0	135.0	106.0	106.0	106.0	106.0	106.0	135.0	135.0	135.0
		005	Litchfield County	135.0	135.0	135.0	135.0	106.0	106.0	106.0	106.0	106.0	135.0	135.0	135.0
		007	Middlesex County	135.0	135.0	135.0	135.0	106.0	106.0	106.0	106.0	106.0	135.0	135.0	135.0
		009	New Haven County	135.0	135.0	135.0	135.0	106.0	106.0	106.0	106.0	106.0	135.0	135.0	135.0
		011	New London County	135.0	135.0	135.0	135.0	106.0	106.0	106.0	106.0	106.0	135.0	135.0	135.0
		013	Tolland County	135.0	135.0	135.0	135.0	106.0	106.0	106.0	106.0	106.0	135.0	135.0	135.0
		015	Windham County	135.0	135.0	135.0	135.0	106.0	106.0	106.0	106.0	106.0	135.0	135.0	135.0
10	**DELAWARE**														
RVP, psi															
		001	Kent County	13.4	13.4	10.6	10.6	6.8	6.8	6.8	6.8	6.8	10.6	10.6	13.4
		003	New Castle County	13.4	13.4	10.6	10.6	6.8	6.8	6.8	6.8	6.8	10.6	10.6	13.4
		005	Sussex County	13.4	13.4	10.4	10.4	6.4	6.4	6.4	6.4	6.4	10.4	10.4	13.4
Oxygen Weight Percent															
		001	Kent County	1.8442	1.8442	1.9457	1.9457	2.0896	2.0896	2.0896	2.0896	2.0896	1.9457	1.9457	1.8442
		003	New Castle County	1.8442	1.8442	1.9457	1.9457	2.0896	2.0896	2.0896	2.0896	2.0896	1.9457	1.9457	1.8442
		005	Sussex County	1.4645	1.4645	1.5538	1.5538	1.6431	1.6431	1.6431	1.6431	1.6431	1.5538	1.5538	1.4645
Gasoline Sulfur, ppm															
		001	Kent County	174.0	174.0	155.1	155.1	130.0	130.0	130.0	130.0	130.0	155.1	155.1	174.0
		003	New Castle County	174.0	174.0	155.1	155.1	130.0	130.0	130.0	130.0	130.0	155.1	155.1	174.0
		005	Sussex County	225.0	225.0	186.0	186.0	134.0	134.0	134.0	134.0	134.0	186.0	186.0	225.0

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
11	DISTRICT OF COLUMBIA														
RVP, psi															
		001	District of Columbia	13.1	13.1	10.4	10.4	6.8	6.8	6.8	6.8	6.8	6.8	10.4	13.1
Oxygen Weight Percent															
		001	District of Columbia	1.7681	1.7681	1.8217	1.8217	1.8932	1.8932	1.8932	1.8932	1.8932	1.8932	1.8217	1.7681
Gasoline Sulfur, ppm															
		001	District of Columbia	230.0	230.0	199.6	199.6	159.0	159.0	159.0	159.0	159.0	159.0	199.6	230.0
23	MAINE														
RVP, psi															
		001	Androscoggin County	12.3	11.1	11.2	8.4	7.5	7.5	7.7	7.3	9.7	10.7	10.3	11.6
		003	Aroostook County	12.3	11.1	11.2	8.4	8.6	8.6	8.4	8.4	9.7	10.7	10.3	11.6
		005	Cumberland County	12.3	11.1	11.2	8.4	7.5	7.5	7.7	7.3	9.7	10.7	10.3	11.6
		007	Franklin County	12.3	11.1	11.2	8.4	8.6	8.6	8.4	8.4	9.7	10.7	10.3	11.6
		009	Hancock County	12.3	11.1	11.2	8.4	8.6	8.6	8.4	8.4	9.7	10.7	10.3	11.6
		011	Kennebec County	12.3	11.1	11.2	8.4	7.5	7.5	7.7	7.3	9.7	10.7	10.3	11.6
		013	Knox County	12.3	11.1	11.2	8.4	7.5	7.5	7.7	7.3	9.7	10.7	10.3	11.6
		015	Lincoln County	12.3	11.1	11.2	8.4	7.5	7.5	7.7	7.3	9.7	10.7	10.3	11.6
		017	Oxford County	12.3	11.1	11.2	8.4	8.6	8.6	8.4	8.4	9.7	10.7	10.3	11.6
		019	Penobscot County	12.3	11.1	11.2	8.4	8.6	8.6	8.4	8.4	9.7	10.7	10.3	11.6
		021	Piscataquis County	12.3	11.1	11.2	8.4	8.6	8.6	8.4	8.4	9.7	10.7	10.3	11.6
		023	Sagadahoc County	12.3	11.1	11.2	8.4	7.5	7.5	7.7	7.3	9.7	10.7	10.3	11.6
		025	Somerset County	12.3	11.1	11.2	8.4	8.6	8.6	8.4	8.4	9.7	10.7	10.3	11.6
		027	Waldo County	12.3	11.1	11.2	8.4	8.6	8.6	8.4	8.4	9.7	10.7	10.3	11.6
		029	Washington County	12.3	11.1	11.2	8.4	8.6	8.6	8.4	8.4	9.7	10.7	10.3	11.6
		031	York County	12.3	11.1	11.2	8.4	7.5	7.5	7.7	7.3	9.7	10.7	10.3	11.6
Oxygen Weight Percent															
		001	Androscoggin County	0.4334	0.6510	0.5390	0.3235	0.2420	0.1753	0.7061	0.6868	0.5895	0.6930	0.3560	0.2080
		003	Aroostook County	0.4334	0.6510	0.5390	0.3235	0.3786	0.5845	0.8545	0.5448	0.5895	0.6930	0.3560	0.2080
		005	Cumberland County	0.4334	0.6510	0.5390	0.3235	0.2420	0.1753	0.7061	0.6868	0.5895	0.6930	0.3560	0.2080
		007	Franklin County	0.4334	0.6510	0.5390	0.3235	0.3786	0.5845	0.8545	0.5448	0.5895	0.6930	0.3560	0.2080
		009	Hancock County	0.4334	0.6510	0.5390	0.3235	0.3786	0.5845	0.8545	0.5448	0.5895	0.6930	0.3560	0.2080
		011	Kennebec County	0.4334	0.6510	0.5390	0.3235	0.2420	0.1753	0.7061	0.6868	0.5895	0.6930	0.3560	0.2080
		013	Knox County	0.4334	0.6510	0.5390	0.3235	0.2420	0.1753	0.7061	0.6868	0.5895	0.6930	0.3560	0.2080
		015	Lincoln County	0.4334	0.6510	0.5390	0.3235	0.2420	0.1753	0.7061	0.6868	0.5895	0.6930	0.3560	0.2080
		017	Oxford County	0.4334	0.6510	0.5390	0.3235	0.3786	0.5845	0.8545	0.5448	0.5895	0.6930	0.3560	0.2080
		019	Penobscot County	0.4334	0.6510	0.5390	0.3235	0.3786	0.5845	0.8545	0.5448	0.5895	0.6930	0.3560	0.2080
		021	Piscataquis County	0.4334	0.6510	0.5390	0.3235	0.3786	0.5845	0.8545	0.5448	0.5895	0.6930	0.3560	0.2080
		023	Sagadahoc County	0.4334	0.6510	0.5390	0.3235	0.2420	0.1753	0.7061	0.6868	0.5895	0.6930	0.3560	0.2080
		025	Somerset County	0.4334	0.6510	0.5390	0.3235	0.3786	0.5845	0.8545	0.5448	0.5895	0.6930	0.3560	0.2080
		027	Waldo County	0.4334	0.6510	0.5390	0.3235	0.3786	0.5845	0.8545	0.5448	0.5895	0.6930	0.3560	0.2080
		029	Washington County	0.4334	0.6510	0.5390	0.3235	0.3786	0.5845	0.8545	0.5448	0.5895	0.6930	0.3560	0.2080
		031	York County	0.4334	0.6510	0.5390	0.3235	0.2420	0.1753	0.7061	0.6868	0.5895	0.6930	0.3560	0.2080
Gasoline Sulfur, ppm															
		001	Androscoggin County	151.5	236.1	221.1	145.4	319.7	268.1	101.1	83.4	159.9	279.8	190.9	171.0
		003	Aroostook County	151.5	236.1	221.1	145.4	170.1	290.9	128.6	299.4	159.9	279.8	190.9	171.0
		005	Cumberland County	151.5	236.1	221.1	145.4	319.7	268.1	101.1	83.4	159.9	279.8	190.9	171.0
		007	Franklin County	151.5	236.1	221.1	145.4	170.1	290.9	128.6	299.4	159.9	279.8	190.9	171.0

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
		009	Hancock County	151.5	236.1	221.1	145.4	170.1	290.9	128.6	299.4	159.9	279.8	190.9	171.0
23	***MAINE (cont'd)***	011	Kennebec County	151.5	236.1	221.1	145.4	319.7	268.1	101.1	83.4	159.9	279.8	190.9	171.0
		013	Knox County	151.5	236.1	221.1	145.4	319.7	268.1	101.1	83.4	159.9	279.8	190.9	171.0
		015	Lincoln County	151.5	236.1	221.1	145.4	319.7	268.1	101.1	83.4	159.9	279.8	190.9	171.0
		017	Oxford County	151.5	236.1	221.1	145.4	170.1	290.9	128.6	299.4	159.9	279.8	190.9	171.0
		019	Penobscot County	151.5	236.1	221.1	145.4	170.1	290.9	128.6	299.4	159.9	279.8	190.9	171.0
		021	Piscataquis County	151.5	236.1	221.1	145.4	170.1	290.9	128.6	299.4	159.9	279.8	190.9	171.0
		023	Sagadahoc County	151.5	236.1	221.1	145.4	319.7	268.1	101.1	83.4	159.9	279.8	190.9	171.0
		025	Somerset County	151.5	236.1	221.1	145.4	170.1	290.9	128.6	299.4	159.9	279.8	190.9	171.0
		027	Waldo County	151.5	236.1	221.1	145.4	170.1	290.9	128.6	299.4	159.9	279.8	190.9	171.0
		029	Washington County	151.5	236.1	221.1	145.4	170.1	290.9	128.6	299.4	159.9	279.8	190.9	171.0
		031	York County	151.5	236.1	221.1	145.4	319.7	268.1	101.1	83.4	159.9	279.8	190.9	171.0
24	**MARYLAND**														
RVP, psi															
		003	Anne Arundel County	12.6	12.6	9.6	9.6	9.6	6.6	6.6	6.6	9.3	9.3	9.3	12.6
		005	Baltimore County	12.6	12.6	9.6	9.6	9.6	6.6	6.6	6.6	9.3	9.3	9.3	12.6
		009	Calvert County	12.6	12.6	9.6	9.6	9.6	6.6	6.6	6.6	9.3	9.3	9.3	12.6
		011	Caroline County	12.6	12.6	9.6	9.6	9.6	8.2	8.2	8.2	9.3	9.3	9.3	12.6
		013	Carroll County	12.6	12.6	9.6	9.6	9.6	6.6	6.6	6.6	9.3	9.3	9.3	12.6
		015	Cecil County	12.6	12.6	9.6	9.6	9.6	6.6	6.6	6.6	9.3	9.3	9.3	12.6
		017	Charles County	12.6	12.6	9.6	9.6	9.6	6.6	6.6	6.6	9.3	9.3	9.3	12.6
		019	Dorchester County	12.6	12.6	9.6	9.6	9.6	8.2	8.2	8.2	9.3	9.3	9.3	12.6
		021	Frederick County	12.6	12.6	9.6	9.6	9.6	6.6	6.6	6.6	9.3	9.3	9.3	12.6
		023	Garrett County	12.6	12.6	9.6	9.6	9.6	8.2	8.2	8.2	9.3	9.3	9.3	12.6
		025	Harford County	12.6	12.6	9.6	9.6	9.6	6.6	6.6	6.6	9.3	9.3	9.3	12.6
		027	Howard County	12.6	12.6	9.6	9.6	9.6	6.6	6.6	6.6	9.3	9.3	9.3	12.6
		029	Kent County	12.6	12.6	9.6	9.6	9.6	6.6	6.6	6.6	9.3	9.3	9.3	12.6
		031	Montgomery County	12.6	12.6	9.6	9.6	9.6	6.6	6.6	6.6	9.3	9.3	9.3	12.6
		033	Prince George's County	12.6	12.6	9.6	9.6	9.6	6.6	6.6	6.6	9.3	9.3	9.3	12.6
		035	Queen Anne's County	12.6	12.6	9.6	9.6	9.6	6.6	6.6	6.6	9.3	9.3	9.3	12.6
		037	St. Mary's County	12.6	12.6	9.6	9.6	9.6	8.2	8.2	8.2	9.3	9.3	9.3	12.6
		039	Somerset County	12.6	12.6	9.6	9.6	9.6	8.2	8.2	8.2	9.3	9.3	9.3	12.6
		041	Talbot County	12.6	12.6	9.6	9.6	9.6	8.2	8.2	8.2	9.3	9.3	9.3	12.6
		043	Washington County	12.6	12.6	9.6	9.6	9.6	8.2	8.2	8.2	9.3	9.3	9.3	12.6
		045	Wicomico County	12.6	12.6	9.6	9.6	9.6	8.2	8.2	8.2	9.3	9.3	9.3	12.6
		047	Worcester County	12.6	12.6	9.6	9.6	9.6	8.2	8.2	8.2	9.3	9.3	9.3	12.6
		510	Baltimore city	12.6	12.6	9.6	9.6	9.6	6.6	6.6	6.6	9.3	9.3	9.3	12.6
Oxygen Weight Percent															
		001	Allegany County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		003	Anne Arundel County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		005	Baltimore County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		009	Calvert County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		011	Caroline County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		013	Carroll County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		015	Cecil County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		017	Charles County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		019	Dorchester County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		021	Frederick County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
		023	Garrett County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
24	***MARYLAND (cont'd)***	025	Harford County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		027	Howard County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		029	Kent County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		031	Montgomery County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		033	Prince George's County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		035	Queen Anne's County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		037	St. Mary's County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		039	Somerset County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		041	Talbot County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		043	Washington County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		045	Wicomico County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		047	Worcester County	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
		510	Baltimore city	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075	2.1075
Gasoline Sulfur, ppm															
		001	Allegany County	207.9	207.9	191.9	191.9	170.5	170.5	170.5	170.5	170.5	170.5	191.9	207.9
		003	Anne Arundel County	211.0	211.0	184.0	129.0	129.0	129.0	129.0	129.0	129.0	148.0	184.0	211.0
		005	Baltimore County	211.0	211.0	184.0	129.0	129.0	129.0	129.0	129.0	129.0	148.0	184.0	211.0
		009	Calvert County	230.0	230.0	199.6	129.0	129.0	129.0	129.0	129.0	129.0	159.0	199.6	230.0
		011	Caroline County	207.9	207.9	191.9	191.9	170.5	170.5	170.5	170.5	170.5	170.5	191.9	207.9
		013	Carroll County	211.0	211.0	184.0	129.0	129.0	129.0	129.0	129.0	129.0	148.0	184.0	211.0
		015	Cecil County	174.0	174.0	155.1	129.0	129.0	129.0	129.0	129.0	129.0	130.0	155.1	174.0
		017	Charles County	230.0	230.0	199.6	129.0	129.0	129.0	129.0	129.0	129.0	159.0	199.6	230.0
		019	Dorchester County	207.9	207.9	191.9	191.9	170.5	170.5	170.5	170.5	170.5	170.5	191.9	207.9
		021	Frederick County	230.0	230.0	199.6	129.0	129.0	129.0	129.0	129.0	129.0	159.0	199.6	230.0
		023	Garrett County	207.9	207.9	191.9	191.9	170.5	170.5	170.5	170.5	170.5	170.5	191.9	207.9
		025	Harford County	211.0	211.0	184.0	129.0	129.0	129.0	129.0	129.0	129.0	148.0	184.0	211.0
		027	Howard County	211.0	211.0	184.0	129.0	129.0	129.0	129.0	129.0	129.0	148.0	184.0	211.0
		029	Kent County	174.0	174.0	155.1	129.0	129.0	129.0	129.0	129.0	129.0	130.0	155.1	174.0
		031	Montgomery County	230.0	230.0	199.6	129.0	129.0	129.0	129.0	129.0	129.0	159.0	199.6	230.0
		033	Prince George's County	230.0	230.0	199.6	129.0	129.0	129.0	129.0	129.0	129.0	159.0	199.6	230.0
		035	Queen Anne's County	174.0	174.0	155.1	129.0	129.0	129.0	129.0	129.0	129.0	130.0	155.1	174.0
		037	St. Mary's County	207.9	207.9	191.9	191.9	170.5	170.5	170.5	170.5	170.5	170.5	191.9	207.9
		039	Somerset County	207.9	207.9	191.9	191.9	170.5	170.5	170.5	170.5	170.5	170.5	191.9	207.9
		041	Talbot County	207.9	207.9	191.9	191.9	170.5	170.5	170.5	170.5	170.5	170.5	191.9	207.9
		043	Washington County	207.9	207.9	191.9	191.9	170.5	170.5	170.5	170.5	170.5	170.5	191.9	207.9
		045	Wicomico County	207.9	207.9	191.9	191.9	170.5	170.5	170.5	170.5	170.5	170.5	191.9	207.9
		047	Worcester County	207.9	207.9	191.9	191.9	170.5	170.5	170.5	170.5	170.5	170.5	191.9	207.9
		510	Baltimore city	211.0	211.0	184.0	129.0	129.0	129.0	129.0	129.0	129.0	148.0	184.0	211.0

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
25	MASSACHUSETTS														
RVP, psi															
		001	Barnstable County	13.5	13.5	13.5	13.5	6.7	6.7	6.7	6.7	6.7	13.5	13.5	13.5
		003	Berkshire County	13.5	13.5	13.5	13.5	6.7	6.7	6.7	6.7	6.7	13.5	13.5	13.5
		005	Bristol County	13.5	13.5	13.5	13.5	6.7	6.7	6.7	6.7	6.7	13.5	13.5	13.5
		007	Dukes County	13.5	13.5	13.5	13.5	6.7	6.7	6.7	6.7	6.7	13.5	13.5	13.5
		009	Essex County	13.5	13.5	13.5	13.5	6.7	6.7	6.7	6.7	6.7	13.5	13.5	13.5
		011	Franklin County	13.5	13.5	13.5	13.5	6.7	6.7	6.7	6.7	6.7	13.5	13.5	13.5
		013	Hampden County	13.5	13.5	13.5	13.5	6.7	6.7	6.7	6.7	6.7	13.5	13.5	13.5
		015	Hampshire County	13.5	13.5	13.5	13.5	6.7	6.7	6.7	6.7	6.7	13.5	13.5	13.5
		017	Middlesex County	13.5	13.5	13.5	13.5	6.7	6.7	6.7	6.7	6.7	13.5	13.5	13.5
		019	Nantucket County	13.5	13.5	13.5	13.5	6.7	6.7	6.7	6.7	6.7	13.5	13.5	13.5
		021	Norfolk County	13.5	13.5	13.5	13.5	6.7	6.7	6.7	6.7	6.7	13.5	13.5	13.5
		023	Plymouth County	13.5	13.5	13.5	13.5	6.7	6.7	6.7	6.7	6.7	13.5	13.5	13.5
		025	Suffolk County	13.5	13.5	13.5	13.5	6.7	6.7	6.7	6.7	6.7	13.5	13.5	13.5
		027	Worcester County	13.5	13.5	13.5	13.5	6.7	6.7	6.7	6.7	6.7	13.5	13.5	13.5
Oxygen Weight Percent															
		001	Barnstable County	1.5002	1.5002	1.5002	1.5002	2.1075	2.1075	2.1075	2.1075	2.1075	1.5002	1.5002	1.5002
		003	Berkshire County	1.5002	1.5002	1.5002	1.5002	2.1075	2.1075	2.1075	2.1075	2.1075	1.5002	1.5002	1.5002
		005	Bristol County	1.5002	1.5002	1.5002	1.5002	2.1075	2.1075	2.1075	2.1075	2.1075	1.5002	1.5002	1.5002
		007	Dukes County	1.5002	1.5002	1.5002	1.5002	2.1075	2.1075	2.1075	2.1075	2.1075	1.5002	1.5002	1.5002
		009	Essex County	1.5002	1.5002	1.5002	1.5002	2.1075	2.1075	2.1075	2.1075	2.1075	1.5002	1.5002	1.5002
		011	Franklin County	1.5002	1.5002	1.5002	1.5002	2.1075	2.1075	2.1075	2.1075	2.1075	1.5002	1.5002	1.5002
		013	Hampden County	1.5002	1.5002	1.5002	1.5002	2.1075	2.1075	2.1075	2.1075	2.1075	1.5002	1.5002	1.5002
		015	Hampshire County	1.5002	1.5002	1.5002	1.5002	2.1075	2.1075	2.1075	2.1075	2.1075	1.5002	1.5002	1.5002
		017	Middlesex County	1.5002	1.5002	1.5002	1.5002	2.1075	2.1075	2.1075	2.1075	2.1075	1.5002	1.5002	1.5002
		019	Nantucket County	1.5002	1.5002	1.5002	1.5002	2.1075	2.1075	2.1075	2.1075	2.1075	1.5002	1.5002	1.5002
		021	Norfolk County	1.5002	1.5002	1.5002	1.5002	2.1075	2.1075	2.1075	2.1075	2.1075	1.5002	1.5002	1.5002
		023	Plymouth County	1.5002	1.5002	1.5002	1.5002	2.1075	2.1075	2.1075	2.1075	2.1075	1.5002	1.5002	1.5002
		025	Suffolk County	1.5002	1.5002	1.5002	1.5002	2.1075	2.1075	2.1075	2.1075	2.1075	1.5002	1.5002	1.5002
		027	Worcester County	1.5002	1.5002	1.5002	1.5002	2.1075	2.1075	2.1075	2.1075	2.1075	1.5002	1.5002	1.5002
Gasoline Sulfur, ppm															
		001	Barnstable County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		003	Berkshire County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		005	Bristol County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		007	Dukes County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		009	Essex County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		011	Franklin County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		013	Hampden County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		015	Hampshire County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		017	Middlesex County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		019	Nantucket County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		021	Norfolk County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		023	Plymouth County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		025	Suffolk County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		027	Worcester County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
33	NEW HAMPSHIRE														
RVP, psi															
		001	Belknap County	13.6	13.6	11.2	11.2	7.9	7.9	7.9	7.9	7.9	11.2	11.2	13.6
		003	Carroll County	13.6	13.6	11.2	11.2	7.9	7.9	7.9	7.9	7.9	11.2	11.2	13.6
		005	Cheshire County	13.6	13.6	11.2	11.2	7.9	7.9	7.9	7.9	7.9	11.2	11.2	13.6
		007	Coos County	13.6	13.6	11.2	11.2	7.9	7.9	7.9	7.9	7.9	11.2	11.2	13.6
		009	Grafton County	13.6	13.6	11.2	11.2	7.9	7.9	7.9	7.9	7.9	11.2	11.2	13.6
		011	Hillsborough County	12.9	12.9	10.2	10.2	6.7	6.7	6.7	6.7	6.7	10.2	10.2	12.9
		013	Merrimack County	12.9	12.9	10.2	10.2	6.7	6.7	6.7	6.7	6.7	10.2	10.2	12.9
		015	Rockingham County	12.9	12.9	10.2	10.2	6.7	6.7	6.7	6.7	6.7	10.2	10.2	12.9
		017	Strafford County	12.9	12.9	10.2	10.2	6.7	6.7	6.7	6.7	6.7	10.2	10.2	12.9
		019	Sullivan County	13.6	13.6	11.2	11.2	7.9	7.9	7.9	7.9	7.9	11.2	11.2	13.6
Oxygen Weight Percent															
		001	Belknap County	0.1786	0.1786	0.2322	0.2322	0.2858	0.2858	0.2858	0.2858	0.2858	0.2322	0.2322	0.1786
		003	Carroll County	0.1786	0.1786	0.2322	0.2322	0.2858	0.2858	0.2858	0.2858	0.2858	0.2322	0.2322	0.1786
		005	Cheshire County	0.1786	0.1786	0.2322	0.2322	0.2858	0.2858	0.2858	0.2858	0.2858	0.2322	0.2322	0.1786
		007	Coos County	0.1786	0.1786	0.2322	0.2322	0.2858	0.2858	0.2858	0.2858	0.2858	0.2322	0.2322	0.1786
		009	Grafton County	0.1786	0.1786	0.2322	0.2322	0.2858	0.2858	0.2858	0.2858	0.2858	0.2322	0.2322	0.1786
		011	Hillsborough County	1.8217	1.8217	1.9110	1.9110	2.0182	2.0182	2.0182	2.0182	2.0182	1.9110	1.9110	1.8217
		013	Merrimack County	1.8217	1.8217	1.9110	1.9110	2.0182	2.0182	2.0182	2.0182	2.0182	1.9110	1.9110	1.8217
		015	Rockingham County	1.9825	1.9825	2.0539	2.0539	2.1432	2.1432	2.1432	2.1432	2.1432	2.0539	2.0539	1.9825
		017	Strafford County	1.9825	1.9825	2.0539	2.0539	2.1432	2.1432	2.1432	2.1432	2.1432	2.0539	2.0539	1.9825
		019	Sullivan County	0.1786	0.1786	0.2322	0.2322	0.2858	0.2858	0.2858	0.2858	0.2858	0.2322	0.2322	0.1786
Gasoline Sulfur, ppm															
		001	Belknap County	228.1	228.1	208.6	208.6	182.5	182.5	182.5	182.5	182.5	208.6	208.6	228.1
		003	Carroll County	228.1	228.1	208.6	208.6	182.5	182.5	182.5	182.5	182.5	208.6	208.6	228.1
		005	Cheshire County	228.1	228.1	208.6	208.6	182.5	182.5	182.5	182.5	182.5	208.6	208.6	228.1
		007	Coos County	228.1	228.1	208.6	208.6	182.5	182.5	182.5	182.5	182.5	208.6	208.6	228.1
		009	Grafton County	228.1	228.1	208.6	208.6	182.5	182.5	182.5	182.5	182.5	208.6	208.6	228.1
		011	Hillsborough County	121.0	121.0	101.3	101.3	75.0	75.0	75.0	75.0	75.0	101.3	101.3	121.0
		013	Merrimack County	121.0	121.0	101.3	101.3	75.0	75.0	75.0	75.0	75.0	101.3	101.3	121.0
		015	Rockingham County	148.0	148.0	121.0	121.0	85.0	85.0	85.0	85.0	85.0	121.0	121.0	148.0
		017	Strafford County	148.0	148.0	121.0	121.0	85.0	85.0	85.0	85.0	85.0	121.0	121.0	148.0
		019	Sullivan County	228.1	228.1	208.6	208.6	182.5	182.5	182.5	182.5	182.5	208.6	208.6	228.1
34	NEW JERSEY														
RVP, psi															
		001	Atlantic County	13.4	13.4	10.6	10.6	6.8	6.8	6.8	6.8	6.8	10.6	10.6	13.4
		003	Bergen County	12.5	12.5	10.1	10.1	6.8	6.8	6.8	6.8	6.8	10.1	10.1	12.5
		005	Burlington County	13.4	13.4	10.6	10.6	6.8	6.8	6.8	6.8	6.8	10.6	10.6	13.4
		007	Camden County	13.4	13.4	10.6	10.6	6.8	6.8	6.8	6.8	6.8	10.6	10.6	13.4
		009	Cape May County	13.4	13.4	10.6	10.6	6.8	6.8	6.8	6.8	6.8	10.6	10.6	13.4
		011	Cumberland County	13.4	13.4	10.6	10.6	6.8	6.8	6.8	6.8	6.8	10.6	10.6	13.4
		013	Essex County	12.5	12.5	10.1	10.1	6.8	6.8	6.8	6.8	6.8	10.1	10.1	12.5
		015	Gloucester County	13.4	13.4	10.6	10.6	6.8	6.8	6.8	6.8	6.8	10.6	10.6	13.4
		017	Hudson County	12.5	12.5	10.1	10.1	6.8	6.8	6.8	6.8	6.8	10.1	10.1	12.5
		019	Hunterdon County	12.5	12.5	10.1	10.1	6.8	6.8	6.8	6.8	6.8	10.1	10.1	12.5
		021	Mercer County	13.4	13.4	10.6	10.6	6.8	6.8	6.8	6.8	6.8	10.6	10.6	13.4
		023	Middlesex County	12.5	12.5	10.1	10.1	6.8	6.8	6.8	6.8	6.8	10.1	10.1	12.5

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
34	***NEW JERSEY***	025	Monmouth County	12.5	12.5	10.1	10.1	6.8	6.8	6.8	6.8	6.8	10.1	10.1	12.5
	(cont'd)	027	Morris County	12.5	12.5	10.1	10.1	6.8	6.8	6.8	6.8	6.8	10.1	10.1	12.5
		029	Ocean County	12.5	12.5	10.1	10.1	6.8	6.8	6.8	6.8	6.8	10.1	10.1	12.5
		031	Passaic County	12.5	12.5	10.1	10.1	6.8	6.8	6.8	6.8	6.8	10.1	10.1	12.5
		033	Salem County	13.4	13.4	10.6	10.6	6.8	6.8	6.8	6.8	6.8	10.6	10.6	13.4
		035	Somerset County	12.5	12.5	10.1	10.1	6.8	6.8	6.8	6.8	6.8	10.1	10.1	12.5
		037	Sussex County	12.5	12.5	10.1	10.1	6.8	6.8	6.8	6.8	6.8	10.1	10.1	12.5
		039	Union County	12.5	12.5	10.1	10.1	6.8	6.8	6.8	6.8	6.8	10.1	10.1	12.5
		041	Warren County	13.4	13.4	10.6	10.6	6.8	6.8	6.8	6.8	6.8	10.6	10.6	13.4
Oxygen Weight Percent															
		001	Atlantic County	1.6922	1.6922	1.8499	1.8499	2.0718	2.0718	2.0718	2.0718	2.0718	1.8499	1.8499	1.6922
		003	Bergen County	1.7172	1.7172	1.7660	1.7660	1.8234	1.8234	1.8234	1.8234	1.8234	1.7660	1.7660	1.7172
		005	Burlington County	1.8442	1.8442	1.9457	1.9457	2.0896	2.0896	2.0896	2.0896	2.0896	1.9457	1.9457	1.8442
		007	Camden County	1.8442	1.8442	1.9457	1.9457	2.0896	2.0896	2.0896	2.0896	2.0896	1.9457	1.9457	1.8442
		009	Cape May County	1.6922	1.6922	1.8499	1.8499	2.0718	2.0718	2.0718	2.0718	2.0718	1.8499	1.8499	1.6922
		011	Cumberland County	1.8442	1.8442	1.9457	1.9457	2.0896	2.0896	2.0896	2.0896	2.0896	1.9457	1.9457	1.8442
		013	Essex County	1.7172	1.7172	1.7660	1.7660	1.8234	1.8234	1.8234	1.8234	1.8234	1.7660	1.7660	1.7172
		015	Gloucester County	1.8442	1.8442	1.9457	1.9457	2.0896	2.0896	2.0896	2.0896	2.0896	1.9457	1.9457	1.8442
		017	Hudson County	1.7172	1.7172	1.7660	1.7660	1.8234	1.8234	1.8234	1.8234	1.8234	1.7660	1.7660	1.7172
		019	Hunterdon County	1.7172	1.7172	1.7660	1.7660	1.8234	1.8234	1.8234	1.8234	1.8234	1.7660	1.7660	1.7172
		021	Mercer County	1.8442	1.8442	1.9457	1.9457	2.0896	2.0896	2.0896	2.0896	2.0896	1.9457	1.9457	1.8442
		023	Middlesex County	1.7172	1.7172	1.7660	1.7660	1.8234	1.8234	1.8234	1.8234	1.8234	1.7660	1.7660	1.7172
		025	Monmouth County	1.7172	1.7172	1.7660	1.7660	1.8234	1.8234	1.8234	1.8234	1.8234	1.7660	1.7660	1.7172
		027	Morris County	1.7172	1.7172	1.7660	1.7660	1.8234	1.8234	1.8234	1.8234	1.8234	1.7660	1.7660	1.7172
		029	Ocean County	1.7172	1.7172	1.7660	1.7660	1.8234	1.8234	1.8234	1.8234	1.8234	1.7660	1.7660	1.7172
		031	Passaic County	1.7172	1.7172	1.7660	1.7660	1.8234	1.8234	1.8234	1.8234	1.8234	1.7660	1.7660	1.7172
		033	Salem County	1.8442	1.8442	1.9457	1.9457	2.0896	2.0896	2.0896	2.0896	2.0896	1.9457	1.9457	1.8442
		035	Somerset County	1.7172	1.7172	1.7660	1.7660	1.8234	1.8234	1.8234	1.8234	1.8234	1.7660	1.7660	1.7172
		037	Sussex County	1.7172	1.7172	1.7660	1.7660	1.8234	1.8234	1.8234	1.8234	1.8234	1.7660	1.7660	1.7172
		039	Union County	1.7172	1.7172	1.7660	1.7660	1.8234	1.8234	1.8234	1.8234	1.8234	1.7660	1.7660	1.7172
		041	Warren County	1.8753	1.8753	1.9110	1.9110	1.9825	1.9825	1.9825	1.9825	1.9825	1.9110	1.9110	1.8753
Gasoline Sulfur, ppm															
		001	Atlantic County	207.0	207.0	174.0	174.0	130.0	130.0	130.0	130.0	130.0	174.0	174.0	207.0
		003	Bergen County	141.0	141.0	129.4	129.4	114.0	114.0	114.0	114.0	114.0	129.4	129.4	141.0
		005	Burlington County	174.0	174.0	155.1	155.1	130.0	130.0	130.0	130.0	130.0	155.1	155.1	174.0
		007	Camden County	174.0	174.0	155.1	155.1	130.0	130.0	130.0	130.0	130.0	155.1	155.1	174.0
		009	Cape May County	207.0	207.0	174.0	174.0	130.0	130.0	130.0	130.0	130.0	174.0	174.0	207.0
		011	Cumberland County	174.0	174.0	155.1	155.1	130.0	130.0	130.0	130.0	130.0	155.1	155.1	174.0
		013	Essex County	141.0	141.0	129.4	129.4	114.0	114.0	114.0	114.0	114.0	129.4	129.4	141.0
		015	Gloucester County	174.0	174.0	155.1	155.1	130.0	130.0	130.0	130.0	130.0	155.1	155.1	174.0
		017	Hudson County	141.0	141.0	129.4	129.4	114.0	114.0	114.0	114.0	114.0	129.4	129.4	141.0
		019	Hunterdon County	141.0	141.0	129.4	129.4	114.0	114.0	114.0	114.0	114.0	129.4	129.4	141.0
		021	Mercer County	174.0	174.0	155.1	155.1	130.0	130.0	130.0	130.0	130.0	155.1	155.1	174.0
		023	Middlesex County	141.0	141.0	129.4	129.4	114.0	114.0	114.0	114.0	114.0	129.4	129.4	141.0
		025	Monmouth County	141.0	141.0	129.4	129.4	114.0	114.0	114.0	114.0	114.0	129.4	129.4	141.0
		027	Morris County	141.0	141.0	129.4	129.4	114.0	114.0	114.0	114.0	114.0	129.4	129.4	141.0
		029	Ocean County	141.0	141.0	129.4	129.4	114.0	114.0	114.0	114.0	114.0	129.4	129.4	141.0
		031	Passaic County	141.0	141.0	129.4	129.4	114.0	114.0	114.0	114.0	114.0	129.4	129.4	141.0

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
34	*NEW JERSEY*	033	Salem County	174.0	174.0	155.1	155.1	130.0	130.0	130.0	130.0	130.0	155.1	155.1	174.0
	(cont'd)	035	Somerset County	141.0	141.0	129.4	129.4	114.0	114.0	114.0	114.0	114.0	129.4	129.4	141.0
		037	Sussex County	141.0	141.0	129.4	129.4	114.0	114.0	114.0	114.0	114.0	129.4	129.4	141.0
		039	Union County	141.0	141.0	129.4	129.4	114.0	114.0	114.0	114.0	114.0	129.4	129.4	141.0
		041	Warren County	125.0	125.0	123.7	123.7	122.0	122.0	122.0	122.0	122.0	123.7	123.7	125.0
36	NEW YORK														
RVP, psi															
		001	Albany County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		003	Allegany County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		005	Bronx County	12.8	12.6	12.1	9.0	6.8	6.7	6.6	6.7	6.9	10.3	11.7	12.5
		007	Broome County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		009	Cattaraugus County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		011	Cayuga County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		013	Chautauqua County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		015	Chemung County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		017	Chenango County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		019	Clinton County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		021	Columbia County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		023	Cortland County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		025	Delaware County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		027	Dutchess County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		029	Erie County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		031	Essex County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		033	Franklin County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		035	Fulton County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		037	Genesee County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		039	Greene County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		041	Hamilton County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		043	Herkimer County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		045	Jefferson County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		047	Kings County	12.8	12.6	12.1	9.0	6.8	6.7	6.6	6.7	6.9	10.3	11.7	12.5
		049	Lewis County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		051	Livingston County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		053	Madison County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		055	Monroe County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		057	Montgomery County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		059	Nassau County	12.8	12.6	12.1	9.0	6.8	6.7	6.6	6.7	6.9	10.3	11.7	12.5
		061	New York County	12.8	12.6	12.1	9.0	6.8	6.7	6.6	6.7	6.9	10.3	11.7	12.5
		063	Niagara County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		065	Oneida County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		067	Onondaga County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		069	Ontario County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		071	Orange County	12.8	12.6	12.1	9.0	6.8	6.7	6.6	6.7	6.9	10.3	11.7	12.5
		073	Orleans County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		075	Oswego County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		077	Otsego County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		079	Putnam County	12.8	12.6	12.1	9.0	6.8	6.7	6.6	6.7	6.9	10.3	11.7	12.5
		081	Queens County	12.8	12.6	12.1	9.0	6.8	6.7	6.6	6.7	6.9	10.3	11.7	12.5

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
36	*NEW YORK (cont'd)*	083	Rensselaer County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		085	Richmond County	12.8	12.6	12.1	9.0	6.8	6.7	6.6	6.7	6.9	10.3	11.7	12.5
		087	Rockland County	12.8	12.6	12.1	9.0	6.8	6.7	6.6	6.7	6.9	10.3	11.7	12.5
		089	St. Lawrence County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		091	Saratoga County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		093	Schenectady County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		095	Schoharie County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		097	Schuyler County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		099	Seneca County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		101	Steuben County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		103	Suffolk County	12.8	12.6	12.1	9.0	6.8	6.7	6.6	6.7	6.9	10.3	11.7	12.5
		105	Sullivan County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		107	Tioga County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		109	Tompkins County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		111	Ulster County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		113	Warren County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		115	Washington County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		117	Wayne County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		119	Westchester County	12.8	12.6	12.1	9.0	6.8	6.7	6.6	6.7	6.9	10.3	11.7	12.5
		121	Wyoming County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
		123	Yates County	12.7	12.7	12.6	10.9	8.6	8.3	8.3	8.2	8.2	9.6	10.7	11.4
Oxygen Weight Percent															
		001	Albany County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		003	Allegany County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		005	Bronx County	1.8932	1.9467	1.8932	1.8753	1.9646	1.9467	1.9646	1.8217	1.9646	1.8217	1.8574	1.6431
		007	Broome County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		009	Cattaraugus County	0.8965	1.0344	0.8275	0.6551	0.8965	0.5862	0.8275	0.9654	0.6551	0.6896	0.9310	0.8965
		011	Cayuga County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		013	Chautauqua County	0.8965	1.0344	0.8275	0.6551	0.8965	0.5862	0.8275	0.9654	0.6551	0.6896	0.9310	0.8965
		015	Chemung County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		017	Chenango County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		019	Clinton County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		021	Columbia County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		023	Cortland County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		025	Delaware County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		027	Dutchess County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		029	Erie County	0.8965	1.0344	0.8275	0.6551	0.8965	0.5862	0.8275	0.9654	0.6551	0.6896	0.9310	0.8965
		031	Essex County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		033	Franklin County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		035	Fulton County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		037	Genesee County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		039	Greene County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		041	Hamilton County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		043	Herkimer County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		045	Jefferson County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		047	Kings County	1.8932	1.9467	1.8932	1.8753	1.9646	1.9467	1.9646	1.8217	1.9646	1.8217	1.8574	1.6431
		049	Lewis County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		051	Livingston County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		053	Madison County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
36	*NEW YORK*	055	Monroe County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
	(cont'd)	057	Montgomery County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		059	Nassau County	1.8932	1.9467	1.8932	1.8753	1.9646	1.9467	1.9646	1.8217	1.9646	1.8217	1.8574	1.6431
		061	New York County	1.8932	1.9467	1.8932	1.8753	1.9646	1.9467	1.9646	1.8217	1.9646	1.8217	1.8574	1.6431
		063	Niagara County	0.8965	1.0344	0.8275	0.6551	0.8965	0.5862	0.8275	0.9654	0.6551	0.6896	0.9310	0.8965
		065	Oneida County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		067	Onondaga County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		069	Ontario County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		071	Orange County	1.8932	1.9467	1.8932	1.8753	1.9646	1.9467	1.9646	1.8217	1.9646	1.8217	1.8574	1.6431
		073	Orleans County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		075	Oswego County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		077	Otsego County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		079	Putnam County	1.8932	1.9467	1.8932	1.8753	1.9646	1.9467	1.9646	1.8217	1.9646	1.8217	1.8574	1.6431
		081	Queens County	1.8932	1.9467	1.8932	1.8753	1.9646	1.9467	1.9646	1.8217	1.9646	1.8217	1.8574	1.6431
		083	Rensselaer County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		085	Richmond County	1.8932	1.9467	1.8932	1.8753	1.9646	1.9467	1.9646	1.8217	1.9646	1.8217	1.8574	1.6431
		087	Rockland County	1.8932	1.9467	1.8932	1.8753	1.9646	1.9467	1.9646	1.8217	1.9646	1.8217	1.8574	1.6431
		089	St. Lawrence County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		091	Saratoga County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		093	Schenectady County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		095	Schoharie County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		097	Schuyler County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		099	Seneca County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		101	Steuben County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		103	Suffolk County	1.8932	1.9467	1.8932	1.8753	1.9646	1.9467	1.9646	1.8217	1.9646	1.8217	1.8574	1.6431
		105	Sullivan County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		107	Tioga County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		109	Tompkins County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		111	Ulster County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		113	Warren County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		115	Washington County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		117	Wayne County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		119	Westchester County	1.8932	1.9467	1.8932	1.8753	1.9646	1.9467	1.9646	1.8217	1.9646	1.8217	1.8574	1.6431
		121	Wyoming County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
		123	Yates County	0.8751	1.0180	0.8216	0.6430	0.8930	0.5894	0.8216	0.9466	0.6787	0.6965	0.9466	0.8930
Gasoline Sulfur, ppm															
		001	Albany County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		003	Allegany County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		005	Bronx County	210.0	220.0	180.0	200.0	220.0	210.0	220.0	190.0	190.0	220.0	200.0	240.0
		007	Broome County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		009	Cattaraugus County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		011	Cayuga County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		013	Chautauqua County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		015	Chemung County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		017	Chenango County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		019	Clinton County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		021	Columbia County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		023	Cortland County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		025	Delaware County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
36	*NEW YORK*	027	Dutchess County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
	(cont'd)	029	Erie County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		031	Essex County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		033	Franklin County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		035	Fulton County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		037	Genesee County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		039	Greene County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		041	Hamilton County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		043	Herkimer County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		045	Jefferson County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		047	Kings County	210.0	220.0	180.0	200.0	220.0	210.0	220.0	190.0	190.0	220.0	200.0	240.0
		049	Lewis County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		051	Livingston County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		053	Madison County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		055	Monroe County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		057	Montgomery County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		059	Nassau County	210.0	220.0	180.0	200.0	220.0	210.0	220.0	190.0	190.0	220.0	200.0	240.0
		061	New York County	210.0	220.0	180.0	200.0	220.0	210.0	220.0	190.0	190.0	220.0	200.0	240.0
		063	Niagara County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		065	Oneida County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		067	Onondaga County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		069	Ontario County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		071	Orange County	210.0	220.0	180.0	200.0	220.0	210.0	220.0	190.0	190.0	220.0	200.0	240.0
		073	Orleans County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		075	Oswego County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		077	Otsego County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		079	Putnam County	210.0	220.0	180.0	200.0	220.0	210.0	220.0	190.0	190.0	220.0	200.0	240.0
		081	Queens County	210.0	220.0	180.0	200.0	220.0	210.0	220.0	190.0	190.0	220.0	200.0	240.0
		083	Rensselaer County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		085	Richmond County	210.0	220.0	180.0	200.0	220.0	210.0	220.0	190.0	190.0	220.0	200.0	240.0
		087	Rockland County	210.0	220.0	180.0	200.0	220.0	210.0	220.0	190.0	190.0	220.0	200.0	240.0
		089	St. Lawrence County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		091	Saratoga County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		093	Schenectady County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		095	Schoharie County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		097	Schuyler County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		099	Seneca County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		101	Steuben County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		103	Suffolk County	210.0	220.0	180.0	200.0	220.0	210.0	220.0	190.0	190.0	220.0	200.0	240.0
		105	Sullivan County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		107	Tioga County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		109	Tompkins County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		111	Ulster County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		113	Warren County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		115	Washington County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		117	Wayne County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		119	Westchester County	210.0	220.0	180.0	200.0	220.0	210.0	220.0	190.0	190.0	220.0	200.0	240.0
		121	Wyoming County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0
		123	Yates County	260.0	250.0	250.0	230.0	310.0	320.0	340.0	290.0	270.0	250.0	250.0	210.0

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
42	PENNSYLVANIA														
RVP, psi															
		001	Adams County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		003	Allegheny County	13.5	13.5	11.0	11.0	7.8	7.8	7.8	7.8	7.8	11.0	11.0	13.5
		005	Armstrong County	13.5	13.5	11.0	11.0	7.8	7.8	7.8	7.8	7.8	11.0	11.0	13.5
		007	Beaver County	13.5	13.5	11.0	11.0	7.8	7.8	7.8	7.8	7.8	11.0	11.0	13.5
		009	Bedford County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		011	Berks County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		013	Blair County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		015	Bradford County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		017	Bucks County	13.5	13.5	10.6	10.6	6.7	6.7	6.7	6.7	6.7	10.6	10.6	13.5
		019	Butler County	13.5	13.5	11.0	11.0	7.8	7.8	7.8	7.8	7.8	11.0	11.0	13.5
		021	Cambria County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		023	Cameron County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		025	Carbon County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		027	Centre County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		029	Chester County	13.5	13.5	10.6	10.6	6.7	6.7	6.7	6.7	6.7	10.6	10.6	13.5
		031	Clarion County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		033	Clearfield County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		035	Clinton County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		037	Columbia County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		039	Crawford County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		041	Cumberland County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		043	Dauphin County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		045	Delaware County	13.5	13.5	10.6	10.6	6.7	6.7	6.7	6.7	6.7	10.6	10.6	13.5
		047	Elk County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		049	Erie County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		051	Fayette County	13.5	13.5	11.0	11.0	7.8	7.8	7.8	7.8	7.8	11.0	11.0	13.5
		053	Forest County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		055	Franklin County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		057	Fulton County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		059	Greene County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		061	Huntingdon County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		063	Indiana County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		065	Jefferson County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		067	Juniata County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		069	Lackawanna County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		071	Lancaster County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		073	Lawrence County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		075	Lebanon County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		077	Lehigh County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		079	Luzerne County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		081	Lycoming County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		083	McKean County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		085	Mercer County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		087	Mifflin County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		089	Monroe County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		091	Montgomery County	13.5	13.5	10.6	10.6	6.7	6.7	6.7	6.7	6.7	10.6	10.6	13.5
		093	Montour County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
42	*PENNSYLVANIA*	095	Northampton County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
	(cont'd)	097	Northumberland County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		099	Perry County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		101	Philadelphia County	13.5	13.5	10.6	10.6	6.7	6.7	6.7	6.7	6.7	10.6	10.6	13.5
		103	Pike County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		105	Potter County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		107	Schuylkill County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		109	Snyder County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		111	Somerset County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		113	Sullivan County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		115	Susquehanna County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		117	Tioga County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		119	Union County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		121	Venango County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		123	Warren County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		125	Washington County	13.5	13.5	11.0	11.0	7.8	7.8	7.8	7.8	7.8	11.0	11.0	13.5
		127	Wayne County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		129	Westmoreland County	13.5	13.5	11.0	11.0	7.8	7.8	7.8	7.8	7.8	11.0	11.0	13.5
		131	Wyoming County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
		133	York County	13.5	13.5	11.0	11.0	8.7	8.7	8.7	8.7	8.7	11.0	11.0	13.5
Oxygen Weight Percent															
		001	Adams County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		003	Allegheny County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		005	Armstrong County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		007	Beaver County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		009	Bedford County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		011	Berks County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		013	Blair County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		015	Bradford County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		017	Bucks County	2.5303	2.5303	2.5303	2.5303	2.1075	2.1075	2.1075	2.1075	2.1075	2.5303	2.5303	2.5303
		019	Butler County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		021	Cambria County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		023	Cameron County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		025	Carbon County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		027	Centre County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		029	Chester County	2.5303	2.5303	2.5303	2.5303	2.1075	2.1075	2.1075	2.1075	2.1075	2.5303	2.5303	2.5303
		031	Clarion County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		033	Clearfield County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		035	Clinton County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		037	Columbia County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		039	Crawford County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		041	Cumberland County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		043	Dauphin County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		045	Delaware County	2.5303	2.5303	2.5303	2.5303	2.1075	2.1075	2.1075	2.1075	2.1075	2.5303	2.5303	2.5303
		047	Elk County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		049	Erie County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		051	Fayette County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		053	Forest County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		055	Franklin County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
42	*PENNSYLVANIA (cont'd)*	057	Fulton County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		059	Greene County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		061	Huntingdon County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		063	Indiana County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		065	Jefferson County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		067	Juniata County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		069	Lackawanna County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		071	Lancaster County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		073	Lawrence County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		075	Lebanon County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		077	Lehigh County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		079	Luzerne County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		081	Lycoming County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		083	McKean County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		085	Mercer County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		087	Mifflin County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		089	Monroe County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		091	Montgomery County	2.5303	2.5303	2.5303	2.5303	2.1075	2.1075	2.1075	2.1075	2.1075	2.5303	2.5303	2.5303
		093	Montour County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		095	Northampton County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		097	Northumberland County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		099	Perry County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		101	Philadelphia County	2.5303	2.5303	2.5303	2.5303	2.1075	2.1075	2.1075	2.1075	2.1075	2.5303	2.5303	2.5303
		103	Pike County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		105	Potter County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		107	Schuylkill County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		109	Snyder County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		111	Somerset County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		113	Sullivan County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		115	Susquehanna County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		117	Tioga County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		119	Union County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		121	Venango County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		123	Warren County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		125	Washington County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		127	Wayne County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		129	Westmoreland County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		131	Wyoming County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
		133	York County	0.1965	0.1965	0.2322	0.2322	0.2679	0.2679	0.2679	0.2679	0.2679	0.2322	0.2322	0.1965
Gasoline Sulfur, ppm															
		001	Adams County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		003	Allegheny County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		005	Armstrong County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		007	Beaver County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		009	Bedford County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		011	Berks County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		013	Blair County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		015	Bradford County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		017	Bucks County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
42	*PENNSYLVANIA (cont'd)*	019	Butler County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		021	Cambria County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		023	Cameron County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		025	Carbon County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		027	Centre County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		029	Chester County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		031	Clarion County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		033	Clearfield County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		035	Clinton County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		037	Columbia County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		039	Crawford County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		041	Cumberland County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		043	Dauphin County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		045	Delaware County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		047	Elk County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		049	Erie County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		051	Fayette County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		053	Forest County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		055	Franklin County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		057	Fulton County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		059	Greene County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		061	Huntingdon County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		063	Indiana County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		065	Jefferson County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		067	Juniata County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		069	Lackawanna County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		071	Lancaster County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		073	Lawrence County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		075	Lebanon County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		077	Lehigh County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		079	Luzerne County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		081	Lycoming County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		083	McKean County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		085	Mercer County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		087	Mifflin County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		089	Monroe County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		091	Montgomery County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		093	Montour County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		095	Northampton County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		097	Northumberland County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		099	Perry County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		101	Philadelphia County	279.0	279.0	279.0	279.0	129.0	129.0	129.0	129.0	129.0	279.0	279.0	279.0
		103	Pike County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		105	Potter County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		107	Schuylkill County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		109	Snyder County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		111	Somerset County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		113	Sullivan County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		115	Susquehanna County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
42	*PENNSYLVANIA (cont'd)*	117	Tioga County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		119	Union County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		121	Venango County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		123	Warren County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		125	Washington County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		127	Wayne County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		129	Westmoreland County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		131	Wyoming County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
		133	York County	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0
44	**RHODE ISLAND**														
RVP, psi															
		001	Bristol County	12.5	12.5	10.1	10.1	6.9	6.9	6.9	6.9	6.9	10.1	10.1	12.5
		003	Kent County	12.5	12.5	10.1	10.1	6.9	6.9	6.9	6.9	6.9	10.1	10.1	12.5
		005	Newport County	12.5	12.5	10.1	10.1	6.9	6.9	6.9	6.9	6.9	10.1	10.1	12.5
		007	Providence County	12.5	12.5	10.1	10.1	6.9	6.9	6.9	6.9	6.9	10.1	10.1	12.5
		009	Washington County	12.5	12.5	10.1	10.1	6.9	6.9	6.9	6.9	6.9	10.1	10.1	12.5
Oxygen Weight Percent															
		001	Bristol County	1.7110	1.7110	1.6801	1.6801	1.6745	1.6745	1.6745	1.6745	1.6745	1.6801	1.6801	1.7110
		003	Kent County	1.7110	1.7110	1.6801	1.6801	1.6745	1.6745	1.6745	1.6745	1.6745	1.6801	1.6801	1.7110
		005	Newport County	1.7110	1.7110	1.6801	1.6801	1.6745	1.6745	1.6745	1.6745	1.6745	1.6801	1.6801	1.7110
		007	Providence County	1.7110	1.7110	1.6801	1.6801	1.6745	1.6745	1.6745	1.6745	1.6745	1.6801	1.6801	1.7110
		009	Washington County	1.7110	1.7110	1.6801	1.6801	1.6745	1.6745	1.6745	1.6745	1.6745	1.6801	1.6801	1.7110
Gasoline Sulfur, ppm															
		001	Bristol County	193.0	193.0	166.4	166.4	131.0	131.0	131.0	131.0	131.0	166.4	166.4	193.0
		003	Kent County	193.0	193.0	166.4	166.4	131.0	131.0	131.0	131.0	131.0	166.4	166.4	193.0
		005	Newport County	193.0	193.0	166.4	166.4	131.0	131.0	131.0	131.0	131.0	166.4	166.4	193.0
		007	Providence County	193.0	193.0	166.4	166.4	131.0	131.0	131.0	131.0	131.0	166.4	166.4	193.0
		009	Washington County	193.0	193.0	166.4	166.4	131.0	131.0	131.0	131.0	131.0	166.4	166.4	193.0

Table C-1 (continued)

FIPS_State	State	FIPS_County	County	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
50	VERMONT														
RVP, psi															
		001	Addison County	9.5	9.5	9.5	9.5	8.5	8.5	8.5	8.5	8.5	9.5	9.5	9.5
		003	Bennington County	9.5	9.5	9.5	9.5	8.5	8.5	8.5	8.5	8.5	9.5	9.5	9.5
		005	Caledonia County	9.5	9.5	9.5	9.5	8.5	8.5	8.5	8.5	8.5	9.5	9.5	9.5
		007	Chittenden County	9.5	9.5	9.5	9.5	8.5	8.5	8.5	8.5	8.5	9.5	9.5	9.5
		009	Essex County	9.5	9.5	9.5	9.5	8.5	8.5	8.5	8.5	8.5	9.5	9.5	9.5
		011	Franklin County	9.5	9.5	9.5	9.5	8.5	8.5	8.5	8.5	8.5	9.5	9.5	9.5
		013	Grand Isle County	9.5	9.5	9.5	9.5	8.5	8.5	8.5	8.5	8.5	9.5	9.5	9.5
		015	Lamoille County	9.5	9.5	9.5	9.5	8.5	8.5	8.5	8.5	8.5	9.5	9.5	9.5
		017	Orange County	9.5	9.5	9.5	9.5	8.5	8.5	8.5	8.5	8.5	9.5	9.5	9.5
		019	Orleans County	9.5	9.5	9.5	9.5	8.5	8.5	8.5	8.5	8.5	9.5	9.5	9.5
		021	Rutland County	9.5	9.5	9.5	9.5	8.5	8.5	8.5	8.5	8.5	9.5	9.5	9.5
		023	Washington County	9.5	9.5	9.5	9.5	8.5	8.5	8.5	8.5	8.5	9.5	9.5	9.5
		025	Windham County	9.5	9.5	9.5	9.5	8.5	8.5	8.5	8.5	8.5	9.5	9.5	9.5
		027	Windsor County	9.5	9.5	9.5	9.5	8.5	8.5	8.5	8.5	8.5	9.5	9.5	9.5
Oxygen Weight Percent															
		001	Addison County	0.1786	0.1786	0.2143	0.2143	0.2679	0.2679	0.2679	0.2679	0.2679	0.2143	0.2143	0.1786
		003	Bennington County	0.1786	0.1786	0.2143	0.2143	0.2679	0.2679	0.2679	0.2679	0.2679	0.2143	0.2143	0.1786
		005	Caledonia County	0.1786	0.1786	0.2143	0.2143	0.2679	0.2679	0.2679	0.2679	0.2679	0.2143	0.2143	0.1786
		007	Chittenden County	0.1786	0.1786	0.2143	0.2143	0.2679	0.2679	0.2679	0.2679	0.2679	0.2143	0.2143	0.1786
		009	Essex County	0.1786	0.1786	0.2143	0.2143	0.2679	0.2679	0.2679	0.2679	0.2679	0.2143	0.2143	0.1786
		011	Franklin County	0.1786	0.1786	0.2143	0.2143	0.2679	0.2679	0.2679	0.2679	0.2679	0.2143	0.2143	0.1786
		013	Grand Isle County	0.1786	0.1786	0.2143	0.2143	0.2679	0.2679	0.2679	0.2679	0.2679	0.2143	0.2143	0.1786
		015	Lamoille County	0.1786	0.1786	0.2143	0.2143	0.2679	0.2679	0.2679	0.2679	0.2679	0.2143	0.2143	0.1786
		017	Orange County	0.1786	0.1786	0.2143	0.2143	0.2679	0.2679	0.2679	0.2679	0.2679	0.2143	0.2143	0.1786
		019	Orleans County	0.1786	0.1786	0.2143	0.2143	0.2679	0.2679	0.2679	0.2679	0.2679	0.2143	0.2143	0.1786
		021	Rutland County	0.1786	0.1786	0.2143	0.2143	0.2679	0.2679	0.2679	0.2679	0.2679	0.2143	0.2143	0.1786
		023	Washington County	0.1786	0.1786	0.2143	0.2143	0.2679	0.2679	0.2679	0.2679	0.2679	0.2143	0.2143	0.1786
		025	Windham County	0.1786	0.1786	0.2143	0.2143	0.2679	0.2679	0.2679	0.2679	0.2679	0.2143	0.2143	0.1786
		027	Windsor County	0.1786	0.1786	0.2143	0.2143	0.2679	0.2679	0.2679	0.2679	0.2679	0.2143	0.2143	0.1786
Gasoline Sulfur, ppm															
		001	Addison County	209.3	209.3	209.3	209.3	183.1	183.1	183.1	183.1	183.1	209.3	209.3	209.3
		003	Bennington County	209.3	209.3	209.3	209.3	183.1	183.1	183.1	183.1	183.1	209.3	209.3	209.3
		005	Caledonia County	209.3	209.3	209.3	209.3	183.1	183.1	183.1	183.1	183.1	209.3	209.3	209.3
		007	Chittenden County	209.3	209.3	209.3	209.3	183.1	183.1	183.1	183.1	183.1	209.3	209.3	209.3
		009	Essex County	209.3	209.3	209.3	209.3	183.1	183.1	183.1	183.1	183.1	209.3	209.3	209.3
		011	Franklin County	209.3	209.3	209.3	209.3	183.1	183.1	183.1	183.1	183.1	209.3	209.3	209.3
		013	Grand Isle County	209.3	209.3	209.3	209.3	183.1	183.1	183.1	183.1	183.1	209.3	209.3	209.3
		015	Lamoille County	209.3	209.3	209.3	209.3	183.1	183.1	183.1	183.1	183.1	209.3	209.3	209.3
		017	Orange County	209.3	209.3	209.3	209.3	183.1	183.1	183.1	183.1	183.1	209.3	209.3	209.3
		019	Orleans County	209.3	209.3	209.3	209.3	183.1	183.1	183.1	183.1	183.1	209.3	209.3	209.3
		021	Rutland County	209.3	209.3	209.3	209.3	183.1	183.1	183.1	183.1	183.1	209.3	209.3	209.3
		023	Washington County	209.3	209.3	209.3	209.3	183.1	183.1	183.1	183.1	183.1	209.3	209.3	209.3
		025	Windham County	209.3	209.3	209.3	209.3	183.1	183.1	183.1	183.1	183.1	209.3	209.3	209.3
		027	Windsor County	209.3	209.3	209.3	209.3	183.1	183.1	183.1	183.1	183.1	209.3	209.3	209.3

About MARAMA

The Mid-Atlantic Regional Air Management Association is an association of ten state and local air pollution control agencies. MARAMA's mission is to strengthen the skills and capabilities of member agencies and to help them work together to prevent and reduce air pollution impacts in the Mid-Atlantic Region.

MARAMA provides cost-effective approaches to regional collaboration by pooling resources to develop and analyze data, share ideas, and train staff to implement common requirements.

The following State and Local governments are MARAMA members: Delaware, the District of Columbia, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, West Virginia, Philadelphia, and Allegheny County, Pennsylvania.

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About MACTEC Federal Programs, Inc.

MACTEC, Inc. is a leader in the engineering, environmental and remedial construction industries. MACTEC provides premier management, technical, and professional services to help clients successfully manage complex businesses, projects, and facilities. MACTEC Federal Programs, Inc. is a division of MACTEC that provides these same services tailored to meet the unique needs of government agencies, including state/local agencies and federal agencies.

ATTACHMENT N

Development of Emission Projections for 2009, 2012, and 2018 for NonEGU Point, Area, and Nonroad Sources in the MANE-VU Region

Mid-Atlantic Regional Air Management Association

Development of Emission Projections
For 2009, 2012, and 2018
For NonEGU Point, Area, and Nonroad Source
In the MANE-VU Region
Final Report
February, 2007









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Development of Emission Projections for 2009, 2012, and 2018 for NonEGU Point, Area, and Nonroad Sources in the MANE-VU Region

Final Technical Support Document

Prepared for:

Mid-Atlantic Regional Air Management Association (MARAMA)

Prepared by:

MACTEC Federal Programs, Inc.

February 28, 2007

Edward Sabo
Principal Scientist

Douglas A. Toothman
Principal Engineer

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Acronyms and Abbreviations

Acronym	Description
AEO	Annual Energy Outlook
BOTW	Beyond-on-the-Way emission controls
CAIR	Clean Air Interstate Rule
EGAS 5.0	Economic Growth Analysis System Version 5.0
EGU	Electric Generating Unit
EIA	Energy Information Agency
EPA	U.S. Environmental Protection Agency
IDA	Inventory Data Analyzer (data format used by SMOKE modeling system)
IPM	Integrated Planning Model
MANE-VU	Mid-Atlantic/Northeast Visibility Union
MARAMA	Mid-Atlantic Regional Air Management Association
MOBILE6	U.S. EPA's emission model for onroad sources
NESCAUM	Northeast States for Coordinated Air Use Management
NH3	Ammonia
NIF3.0	National Emission Inventory Input Format Version 3.0
NMIM	National Mobile Inventory Model
NONROAD	U.S. EPA's emission model for certain types of nonroad equipment
NOx	Oxides of nitrogen
OTB/OTW	On-the-Books/On-the-Way
OTC	Ozone Transport Commission
PM10-PRI	Particulate matter less than or equal to 10 microns in diameter that includes both the filterable and condensable components of particulate matter
PM25-PRI	Particulate matter less than or equal to 2.5 microns in diameter that includes both the filterable and condensable components of particulate matter
SIC	Standard Industrial Classification code
SIP	State Implementation Plan
SCC	Source Classification Code
SMOKE	Sparse Matrix Operator Kernel Emissions Modeling System
SO2	Sulfur dioxide
VOC	Volatile organic compounds

1.0 EXECUTIVE SUMMARY

This report was prepared for the Mid-Atlantic Regional Air Management Association (MARAMA) as part of an effort to assist states in developing State Implementation Plans (SIPs) for ozone, fine particles, and regional haze. It describes the data sources, methods, and results for emission forecasts for three years, three emission sectors, two emission control scenarios; seven pollutants, and 11 states plus the District of Columbia. The following is a summary of the future year inventories that were developed:

- The three projection years are 2009, 2012, and 2018.
- The three source sectors are non-Electric Generating Units (non-EGUs), area sources, and nonroad mobile sources. (Note: under separate efforts, MANE-VU prepared EGU projections using the Integrated Planning Model {IPM} and onroad mobile source projections using the SMOKE emission modeling system).
- The two emission control scenarios are: a) a combined "on-the-books/on-the-way" (OTB/W) control strategy accounting for emission control regulations already in place as well as emission control regulations that are not yet finalized but are likely to achieve additional reductions by 2009; and b) a "beyond-on-the-way" (BOTW) scenarios to account for controls from potential new regulations that may be necessary to meet attainment and other regional air quality goals.
- The seven pollutants are sulfur dioxide (SO2), oxides of nitrogen (NOx), volatile organic compounds (VOC), carbon monoxide (CO), particulate matter less than or equal to 10 microns in diameter that includes both the filterable and condensable components of particulate matter (PM10-PRI), particulate matter less than or equal to 2.5 microns in diameter that includes both the filterable and condensable components of particulate matter (PM25-PRI), and ammonia (NH3).
- The states are those that comprise the Mid-Atlantic/Northeast Visibility Union (MANE-VU) region. In addition to the District of Columbia, the 11 MANE-VU states are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

The results of the emission projections are summarized in Table 1-1 and Figures 1-1 to 1-7.

Section 2 of this report describes how the nonEGU OTB/W emission projections were made. Section 3 describes the methods for the area source emission projections. Section 4 describes the methods for the nonroad section, including sources accounted for by the NONROAD model as well as aircraft, locomotives, and marine vessels. Section 5 describes the development of the BOTW emission projections.

Table 1-1 Summary of MANE-VU Area, NonEGU, and Nonroad Emission Inventory by Pollutant, Sector, and Year Annual Emissions (tons per year)

Pollutant	Sector	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CO	Area	1,326,796	1,283,959	1,283,959	1,260,627	1,260,627	1,211,727	1,211,727
	NonEGU	295,577	328,546	328,546	346,090	346,090	412,723	412,723
	Nonroad	4,553,124	4,969,925	4,969,925	5,099,538	5,099,538	5,401,353	5,401,353
		6,175,497	6,582,430	6,582,430	6,706,255	6,706,255	7,025,803	7,025,803
NH3	Area	249,795	294,934	294,934	312,419	312,419	341,746	341,746
	NonEGU	3,916	4,301	4,301	4,448	4,448	4,986	4,986
	Nonroad	287	317	317	337	337	369	369
		253,998	299,552	299,552	317,204	317,204	347,101	347,101
NOx	Area	265,400	278,038	265,925	281,659	261,057	284,535	263,030
	NonEGU	207,048	210,522	185,658	218,137	184,527	237,802	199,732
	Nonroad	431,631	354,850	354,850	321,935	321,935	271,185	271,185
		904,079	843,410	806,433	821,731	767,519	793,522	733,947
PM10	Area	1,452,309	1,527,586	1,527,586	1,556,316	1,550,400	1,614,476	1,607,602
	NonEGU	51,280	55,869	55,869	57,848	57,624	63,757	63,524
	Nonroad	40,114	34,453	34,453	32,445	32,445	27,059	27,059
		1,543,703	1,617,908	1,617,908	1,646,609	1,640,469	1,705,292	1,698,185
PM2.5	Area	332,521	340,049	340,049	341,875	336,779	345,419	339,461
	NonEGU	33,077	36,497	36,497	37,625	37,444	41,220	41,029
	Nonroad	36,084	30,791	30,791	28,922	28,922	23,938	23,938
		401,682	407,337	407,337	408,422	403,145	410,577	404,428
SO2	Area	286,921	304,018	304,018	305,339	202,058	305,437	190,431
	NonEGU	264,377	249,658	249,658	255,596	253,638	270,433	268,330
	Nonroad	57,257	15,651	15,651	8,731	8,731	8,643	8,643
		608,555	569,327	569,327	569,666	464,427	584,513	467,404
VOC	Area	1,528,269	1,398,982	1,363,278	1,382,803	1,339,851	1,387,882	1,334,039
	NonEGU	91,278	92,279	91,718	96,887	96,260	110,524	109,762
	Nonroad	572,751	460,922	460,922	424,257	424,257	380,080	380,080
		2,192,298	1,952,183	1,915,918	1,903,947	1,860,368	1,878,486	1,823,881

OTB/W – on-the-books/way scenario; BOTW – beyond-on-the-way scenario

Figure 1-1 2002 Base Year, OTB/OTW AND BOTW Annual CO Emissions (tons per year)

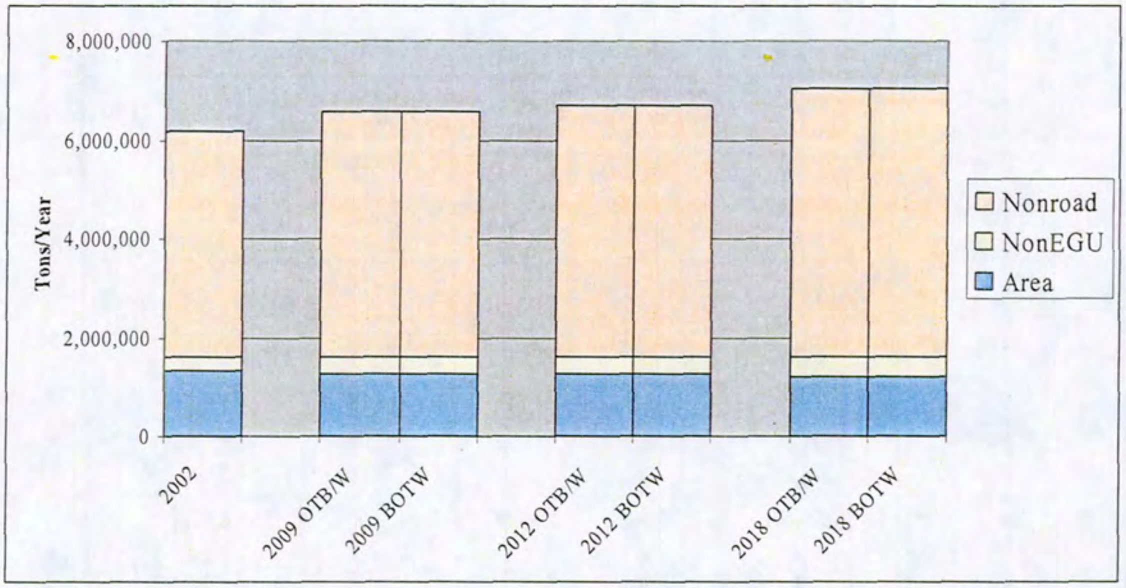


Figure 1-2 2002 Base Year, OTB/OTW AND BOTW Annual NH3 Emissions (tons per year)

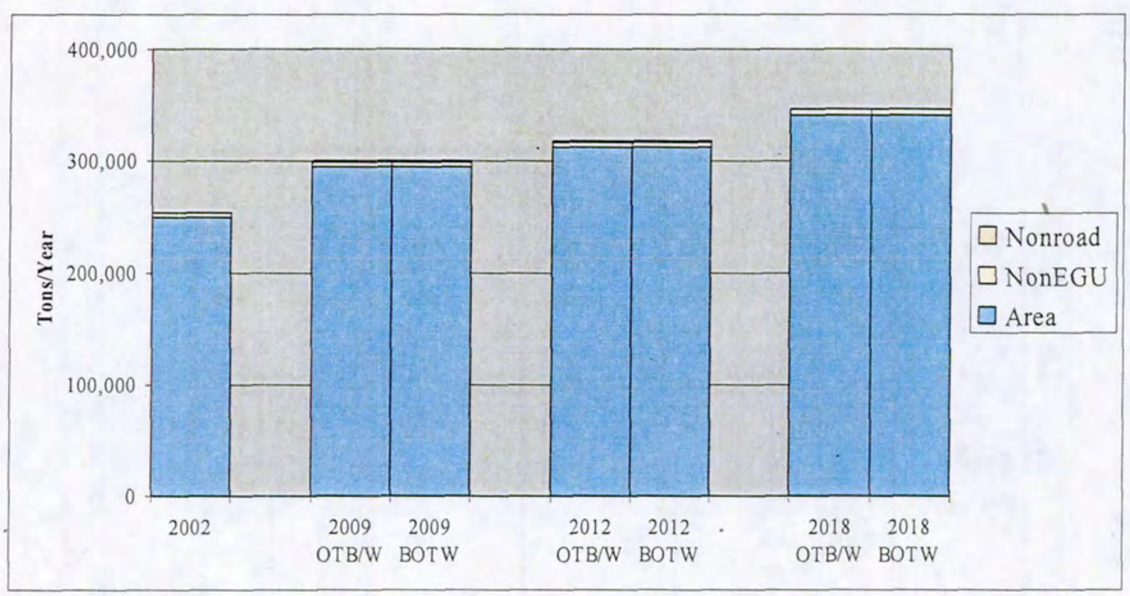


Figure 1-3 2002 Base Year, OTB/OTW AND BOTW Annual NOx Emissions (tons per year)

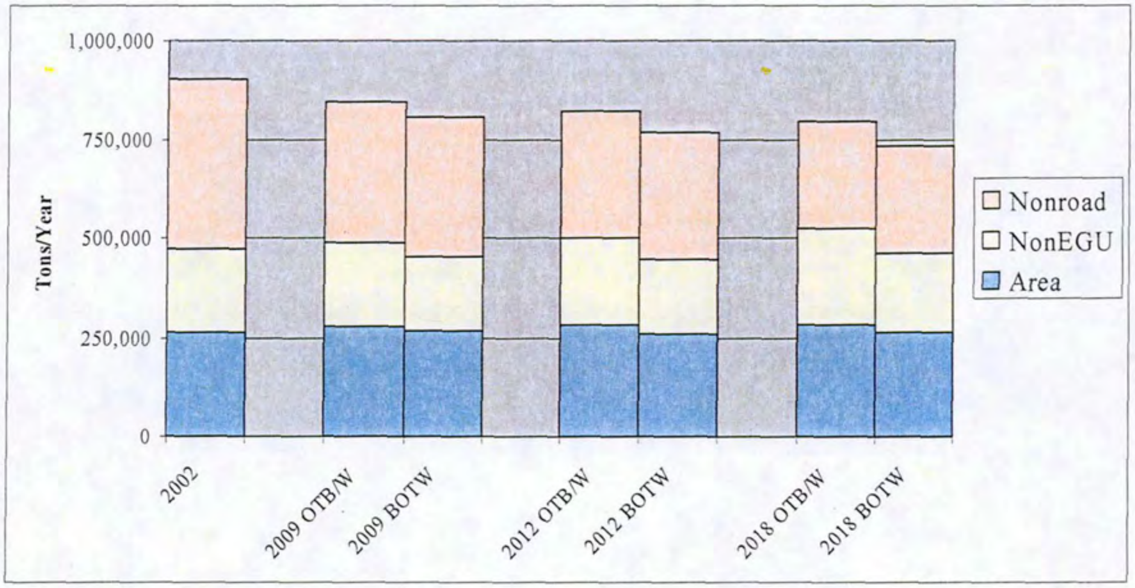


Figure 1-4 2002 Base Year, OTB/OTW AND BOTW Annual SO2 Emissions (tons per year)

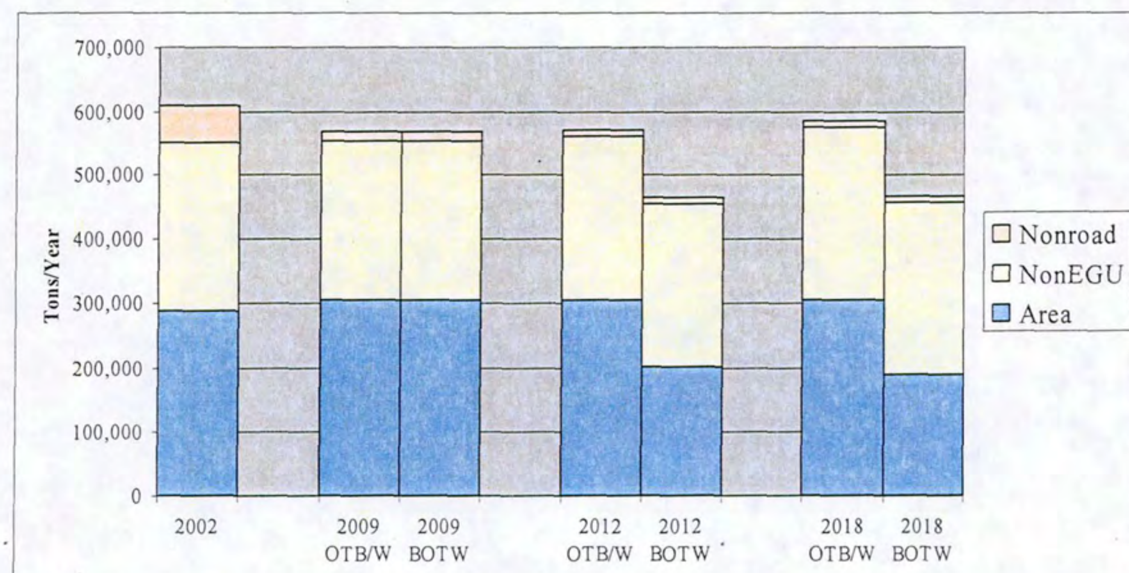


Figure 1-5 2002 Base Year, OTB/OTW AND BOTW Annual PM10 Emissions (tons per year)

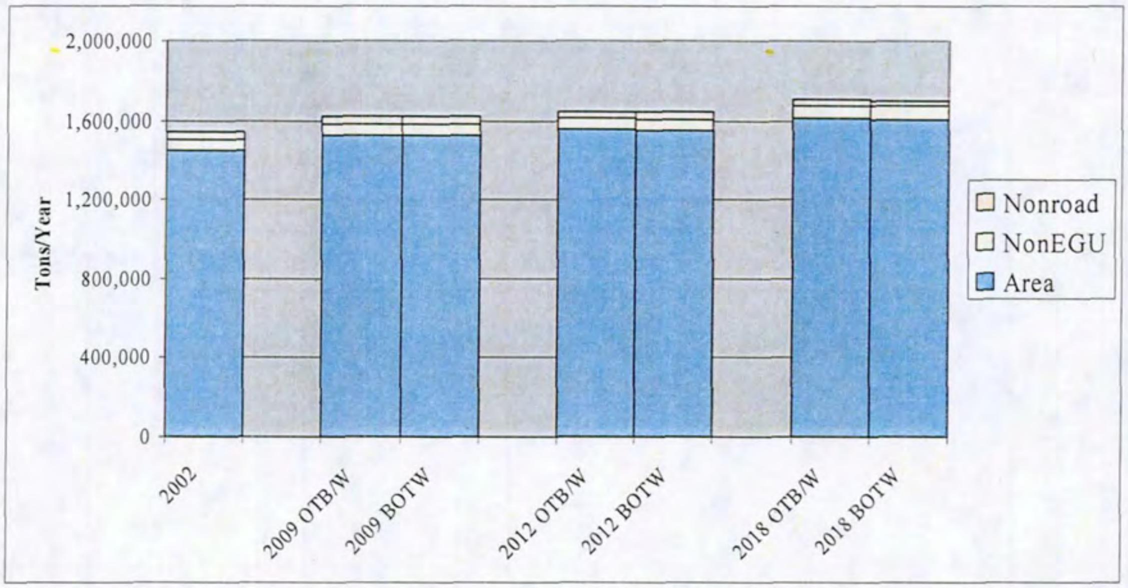


Figure 1-6 2002 Base Year, OTB/OTW AND BOTW Annual PM2.5 Emissions (tons per year)

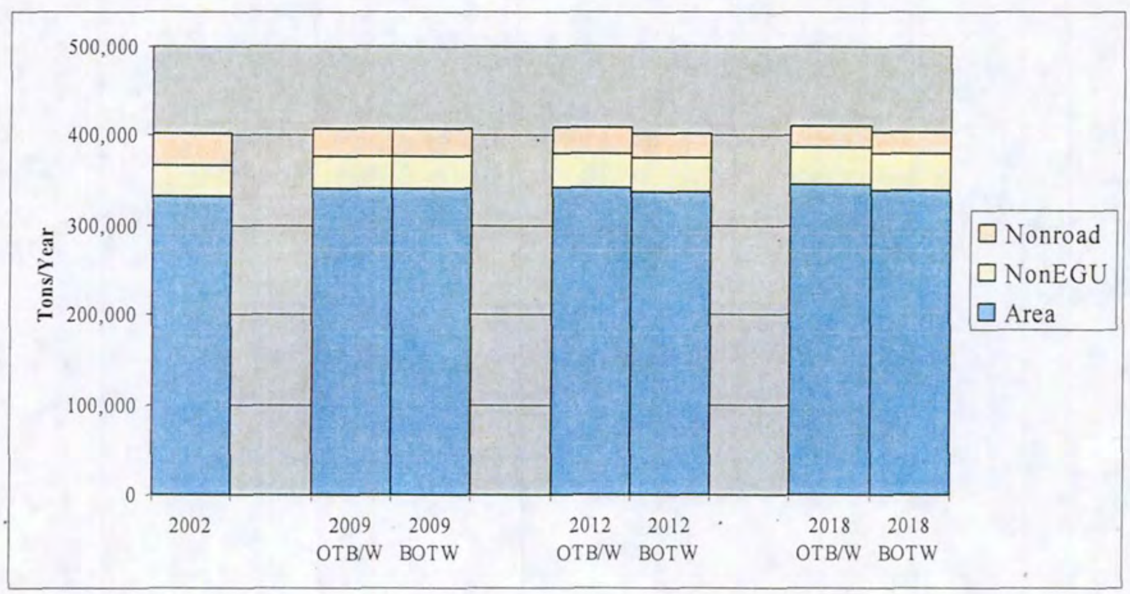
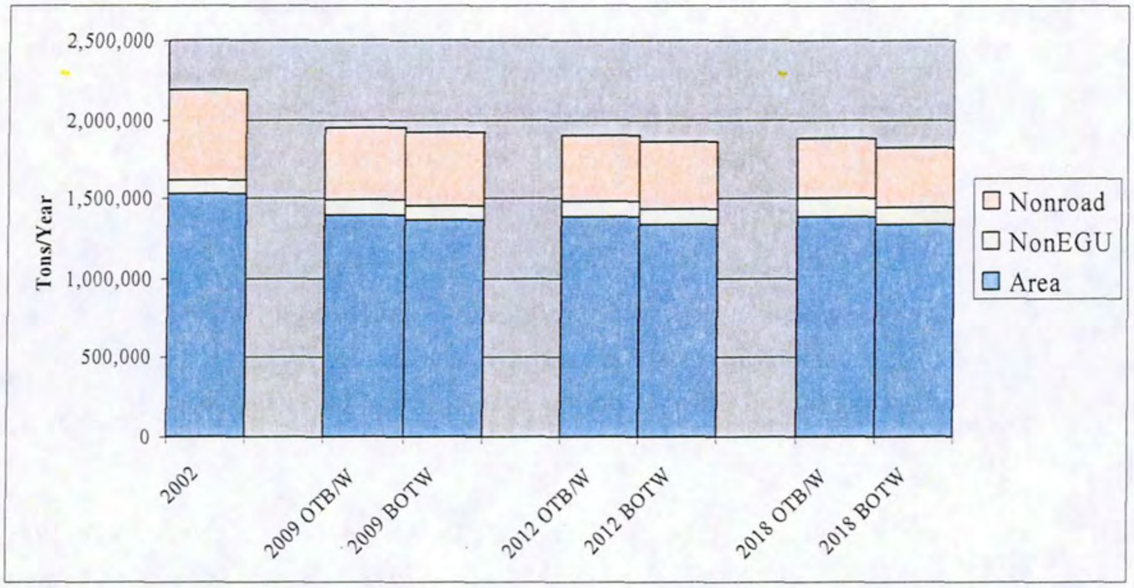


Figure 1-7 2002 Base Year, OTB/OTW AND BOTW Annual VOC Emissions (tons per year)



2.0 NONEGU POINT SOURCES

Under ideal circumstances, all stationary sources would be considered point sources for purposes of emission inventories. In practical applications, however, only sources that emit more than a specified cutoff level of pollutant are considered point sources. In general, the MANE-VU point source inventory includes only major sources (i.e., those required to obtain a Title V operating permit). Some states may include additional stationary sources that emit below the major source thresholds.

For emission projection purposes, the point source inventory is divided into two sub-sectors – the Electric Generating Unit (EGU) sector and the non-EGU sector – because different projections methods are used for these two sectors. For EGUs, MANE-VU used the Integrated Planning Model (IPM) to project future generation as well as to calculate the impact of future control programs on future emission levels.

The procedures for projecting emissions for non-EGUs are described in this section. We started with the MANE-VU 2002 point source emission inventory, which contains data for both EGUs and nonEGUs. We implemented a procedure to split the 2002 point source inventory into two components – and EGU inventory for those units accounted for in IPM, and a nonEGU inventory for those point sources not accounted for in IPM. For the nonEGU sources, we first applied growth factors to account for changes in economic activity. Next, we applied control factors to account for future emission reductions from on-the-books (OTB) control regulations and on-the-way (OTW) control regulations. The OTB control scenario accounts for post-2002 emission reductions from promulgated federal, State, local, and site-specific control programs as of June 15, 2005. The OTW control scenario accounts for proposed (but not final) control programs that are reasonably anticipated to result in post-2002 emission reductions. We then conducted a series of quality assurance steps to ensure the development of complete, accurate, and consistent emission inventories. We provided the inventories in three formats – the National Emission Inventory Input Format (NIF), SMOKE Inventory Data Analyzer (IDA) format, and SMOKE growth/control packets. We also prepared emission summary tables by state and pollutant. Each of these activities is discussed in this section.

2.1 INITIAL 2002 POINT SOURCE EMISSION INVENTORY

The starting point for the nonEGU projections was Version 3 of the MANE-VU 2002 point source emission inventory (MANE-VU_2002_Pt_Version 3_040706.MDB). Since this file contains both EGUs and nonEGU point sources, and EGU emissions are projected using the IPM, it was necessary to split the 2002 point source file into two components.

The first component contains those emission units accounted for in the IPM forecasts. The second component contains all other point sources not accounted for in IPM.

The MANE-VU 2002 point source inventory contains a cross-reference table (xwalk {MANE-VU}) that matches IPM emission unit identifiers (ORISPL plant code and BLRID emission unit code) to MANE-VU NIF emission unit identifiers (FIPSST state code, FIPSCNTY county code, State Plant ID, State Point ID). Initially, we used this cross-reference table to split the point source file into the EGU and nonEGU components. When there was a match between the IPM ORISPL/BLRID and the MANE-VU emission unit ID, the unit was assigned to the EGU inventory; all other emission units were assigned to the nonEGU inventory. The exception to this rule was for the State of New York. The cross-reference table only contained matches at the plant level, not the emission unit level. So for New York EGUs accounted for in IPM, all emission units at a plant were assigned to the MANE-VU EGU file (including ancillary emission units not accounted for in IPM).

After performing this initial splitting of the MANE-VU point source inventory into EGU and nonEGU components, we prepared several ad-hoc QA/QC queries to verify that there was no double-counting of emissions in the EGU and nonEGU inventories:

- We reviewed the IPM parsed files {VISTASII_PC_1f_AllUnits_2009 (To Client).xls and VISTASII_PC_1f_AllUnits_2018 (To Client).xls} to identify EGUs accounted for in IPM. We compared this list of emission units to the nonEGU inventory derived from the MANE-VU cross-reference table to verify that units accounted for in IPM were not double-counted in the nonEGU inventory. As a result of this comparison, we made a few adjustments in the cross-reference table to add emission units for four plants to ensure these units accounted for in IPM were moved to the EGU inventory.

- We reviewed the nonEGU inventory to identify remaining emission units with an Standard Industrial Classification (SIC) code of "4911 Electrical Services" or Source Classification Code of "1-01-xxx-xx External Combustion Boiler, Electric Generation". We compared the list of sources meeting these selection criteria to the IPM parsed file to ensure that these units were not double-counted.

- We compared the number of records for each NIF table in the original 2002 point source file to the 2002 EGU and 2002 nonEGU files. We determined that the sum of the number of records in the EGU file and the number of records in the nonEGU file equaled the number of records in the original 2002 point source file.

- We compared the emissions by pollutant and state in the original 2002 point source file to the 2002 EGU file and 2002 nonEGU files. We determined that the sum of the emissions in the EGU file and the emissions in the nonEGU file equaled the emissions in the original 2002 point source file.

As a result of this procedure, we created separate sets of NIF tables for 2002 for EGUs (i.e., units accounted for in IPM) and nonEGUs. The nonEGU set of 2002 NIF tables were used in all subsequent projections for 2009/2012/2018.

After release of Version 3 of the MANE-VU 2002 inventory, New Jersey discovered that fugitive emissions from petroleum refineries were missing from Version 3. New Jersey supplied MACTEC with the emission unit identifiers for the fugitive releases, and the appropriate records were added to the 2002 NIF files.. MACTEC used these revised fugitive estimates for projecting emissions to 2009/2012/2018.

2.2 NONEGU POINT SOURCE GROWTH FACTORS

The nonEGU growth factors were developed using three sets of data:

- The U.S. EPA's Economic Growth and Analysis System Version 5.0 (EGAS 5.0) using the default SCC configuration. EGAS 5.0 generates growth factors from REMI's 53 Sector Policy Insight Model Version 5.5, the U.S. Department of Energy (DOE) Annual Energy Outlook 2004 (AEO2004) fuel use projections, and national vehicle mile travel projections from EPA's MOBILE 4.1 Fuel Combustion Model;

- The DOE's Annual Energy Outlook 2005 (AEO2005) fuel consumption forecasts were used to replace the AEO2004 forecasts that are used as the default values in EGAS 5.0; and

- State-supplied population, employment, and other emission projection data.

The priority for applying these growth factors was to first use the state-supplied projection data (if available). If no state-supplied data are available, then we used the AEO2005 projection factors for fuel consumption sources. If data from these two sources were not available, we used the EGAS 5.0 default SCC configuration. Appendix A lists the nonEGU point source growth factors used for this study.

2.2.1 EGAS 5.0 Growth Factors

EGAS is an EPA-developed economic and activity forecast tool that provides credible growth factors for developing emission inventory projections. Growth factors are generated using national- and regional-economic forecasts. For nonEGUs, the primary economic activity data sets in EGAS 5.0 are:

- State-specific growth rates from the Regional Economic Model, Inc. (REMI) Policy Insight® model, version 5.5. The REMI socioeconomic data (output by industry sector, population, farm sector value added, and gasoline and oil expenditures) are available by 4-digit SIC code at the State level.

- Energy consumption data from the DOE's Energy Information Administration's (EIA) *Annual Energy Outlook 2004, with Projections through 2025* for use in generating growth factors for non-EGU fuel combustion sources. These data include regional or national fuel-use forecast data that were mapped to specific SCCs for the non-EGU fuel use sectors (e.g., commercial coal, industrial natural gas). Growth factors are reported at the Census division level. These Census divisions represent a group of States (e.g., the South Atlantic division includes Delaware, the District of Columbia, and Maryland; the Middle Atlantic division includes New Jersey, New York, and Pennsylvania; the New England division includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont). Although one might expect different growth rates in each of these States due to unique demographic and socioeconomic trends, all States within each division received the same growth rate.

EGAS uses these economic activity datasets and a set of cross-reference files to generate growth factors by Standard Industrial Classification (SIC) code, Source Classification Code (SCC), or Maximum Achievable Control Technology (MACT) codes. Growth factors for 2009, 2012, and 2018 were calculated using 2002 as the base year at the State and SCC level. County-specific growth factors are not available in EGAS 5.0.

There were several SCCs in the MANE-VU 2002 inventory that are not included in the EGAS 5.0 files. As a result, EGAS did not generate growth factors for those SCCs. MACTEC assigned growth factors for the missing SCCs by assigning a surrogate SCC that best represented the missing SCC.

2.2.2 AEO2005 Growth Factors

The default version of EGAS 5.0 uses the DOE's AEO2004 forecasts. We replaced these data with the more recent AEO2005 forecasts to improve the emissions growth factors produced. Using ACCESS, we created a copy of the "DOE EGAS 5" dataset. The dataset includes three tables. One table contains the projection data values from 2001-2025. The other two tables are the MACT and SCC crosswalk tables. The crosswalk tables are linked to the projection table via a "model code". Using the copy of AEO2004 data, we updated the corresponding projection tables with data from the AEO2005 located at: http://www.eia.doe.gov/oiaf/aeo/supplement/supref.html . Using the data and descriptions from the new tables, we matched the projection data to the appropriate model codes and then built a table identical to the DOE EGAS 5 dataset with the new 2005 AEO data. The resulting ACCESS dataset contains a projection data table with the exact same structure as the original except with the new data. The SCC and MACT crosswalks did not require any updates since the model code assignments were not changed in the new data table.

2.2.3 State Specific Growth Factors

In addition to the growth data described above, we received growth projections from several MANE-VU states to be used instead of the default EGAS or AEO2005 growth factors. The following paragraphs describe the growth factors used for each state.

2.2.3.1 Connecticut

Connecticut provided state-level employment-based growth factors for various SIC categories derived from CT Department of Labor (CTDOL) projections. For many manufacturing sectors, employment is projected to decline, indicating the likelihood of reduced activity levels and emissions for those sectors. Associated growth factors are less than one. To ensure consistency within a facility, CTDEP indicated that the employment-based growth factors be used wherever possible, as matched by SIC. MACTEC used the growth factors by SIC code for all sources in CT, including those fuel combustion sources that would otherwise have been projected using the AEO2005 forecasts.

2.2.3.2 Delaware

Delaware provided state-level employment data from the Department of Labor by NAICS codes for 2002 and 2012. We used these data to calculate the growth factor from 2002 to 2012 and interpolated these data to derive growth factors for 2009 and 2018. We matched these industry NAICS groupings to SCC codes in order to create SCC specific growth factors for non-EGU point sources.

2.2.3.3 District of Columbia

DC indicated that it preferred to use the EGAS 5.0 growth factors, with the enhancement of using the DOE's 2005 Annual Energy Outlook data for combustion sources.

2.2.3.4 Maine

Maine indicated that it preferred to use the EGAS 5.0 growth factors and the DOE's 2005 Annual Energy Outlook data for combustion sources.

2.2.3.5 Maryland

Maryland provided growth factors by SCC for all counties in the State. These growth factors were derived from a variety source sources, including the MWCOG Cooperative Forecast 7.0, the BMC Round 6A Cooperative Forecast (prepared by the MD Dept. of Planning, May 2004), and EGAS 5.0.

2.2.3.6 Massachusetts

Massachusetts also provided a link to employment projections for 2000-2010 for very narrow occupational categories that are not directly correlated with SIC or SCC codes. Since we could not match the occupational titles in the Massachusetts employment projections with SIC or SCC codes, MACTEC used the EGAS 5.0 growth factors (with the AEO2005 enhancement for combustion sources) for projecting emissions from nonEGU sources.

2.2.3.7 New Hampshire

New Hampshire indicated that it preferred to use the EGAS 5.0 growth factors, with the enhancement of using the DOE's 2005 Annual Energy Outlook data for combustion sources.

2.2.3.8 New Jersey

New Jersey indicated that it preferred to use the EGAS 5.0 growth factors, with the enhancement of using the DOE's 2005 Annual Energy Outlook data for combustion sources.

2.2.3.9 New York

New York provided county-level employment data for 12 counties in the New York City metro area for 2002, 2009, 2012, and 2018. The employment projections are for broad industry categories not directly correlated with SIC or SCC codes. Since we could not match the 12-county employment projections with SIC or SCC codes, MACTEC used the EGAS 5.0 growth factors (with the AEO2005 enhancement for combustion sources) for projecting emissions from nonEGU sources for both the 12-county area and all other counties in the state.

2.2.3.10 Pennsylvania

Pennsylvania provided total employment projections for a subset of counties. These employment projections do not have enough detail regarding specific industrial groupings to be correlated with SIC or SCC codes. MACTEC used the EGAS 5.0 growth factors (with the AEO2005 enhancement for combustion sources) for projecting emissions from nonEGU sources

2.2.3.11 Rhode Island

Rhode Island provided state-level employment data from the Department of Labor and Training by 3-digit NAICS codes for 2002 and 2012. We used these data to calculate the growth factor from 2002 to 2012 and interpolated these data to derive growth factors for 2009 and 2018. We matched these industry NAICS groupings to SCC codes in order to create SCC specific growth factors for non-EGU point sources.

2.2.3.12 Vermont

Vermont indicated that it preferred to use the EGAS 5.0 growth factors, with the enhancement of using the DOE's 2005 Annual Energy Outlook data for combustion sources.

2.3 NONEGU POINT SOURCE CONTROL FACTORS

The following sections document how the OTB/OTW control factors were developed for the MANE-VU future year inventories. We developed control factors to estimate emission reductions that will result from on-the-books regulations that will result in post-2002 emission reductions and proposed regulations or actions that will result in post-2002 emission reductions. Control factors were developed for the following national, regional, or state control measures:

- NOx SIP Call Phase I (NOx Budget Trading Program)
- NOx SIP Call Phase II
- NOx RACT in 1-hour Ozone SIPs
- NOx OTC 2001 Model Rule for ICI Boilers
- 2-, 4-, 7-, and 10-year MACT Standards
- Combustion Turbine and RICE MACT
- Industrial Boiler/Process Heater MACT
- Refinery Enforcement Initiative
- Source Shutdowns

In addition, states provided specific control measure information about specific sources or regulatory programs in their state. We used the state-specific data to the extent it was available.

2.3.1 NOx SIP Call Phase I

Compliance with the NOx SIP Call in the Ozone Transport Commission (OTC) states was scheduled for May 1, 2003. The requirements applied to all MANE-VU states except Maine, New Hampshire, and Vermont. While the program applies primarily to electric generating units (EGUs), the NOx SIP Call applies to non-EGUs such as large industrial boilers and turbines. The NOx SIP Call did not mandate which sources must reduce emissions; rather, it required states to meet an overall emission budget and gave them flexibility to develop control strategies to meet that budget. All states in the MANE-VU region affected by the NOx SIP Call chose to meet their NOx SIP Call requirements by participating in the NOx Budget Trading Program. We reviewed the available state rules and guidance documents to determine the affected nonEGU sources and ozone season NOx allowances for each source. Future year emissions for non-EGU boilers/turbines were capped at the allowance levels. Since the allowances are given in terms of tons per ozone season (5 months May to September), we calculated annual emissions by multiplying the ozone season allowances by a factor of 12 (annual) / 5 (ozone season). Table B-1 identifies those units included in the NOx SIP Call Phase I budget program.

Cement kilns were also included in Phase I of the NO_x SIP call. There is a cement kiln in Maine, but it is not subject to the NOx SIP call. For the cement kilns in Maryland and New York, a default control efficiency value of 25 percent was applied. For the cement kilns in Pennsylvania, the state provided their best estimates of the actual control efficiency expected for each kiln after the NOx SIP Call. Table B-2 identifies the cement kilns affected by the NOx SIP Call.

2.3.2 NOx SIP Call Phase II

The final Phase II NOx SIP Call rule was promulgated on April 21, 2004. States had until April 21, 2005, to submit SIPs meeting the Phase II NOx budget requirements. The Phase II rule applies to large IC engines, which are primarily used in pipeline transmission service at compressor stations. We have identified affected units using the same methodology as was used by EPA in the proposed Phase II rule (i.e., a large IC engine is one that emitted, on average, more than 1 ton per day during 2002). The final rule reflects a control level of 82 percent for natural gas-fired IC engines and 90 percent for diesel or dual fuel categories. Pennsylvania identified large IC engines affected by the rule. Table B-3 identifies those units included in the NOx SIP Call Phase II.

2.3.3 NOx RACT in 1-hour Ozone SIPs

Emission reductions requirements from NOx reasonably available control technology (RACT) requirements in 1-hour Ozone SIP areas were implemented in or prior to 2002.

These reductions should already be accounted for in the MANE-VU 2002 inventory since the 2002 inventory was based on 2002 actual emissions which includes any reductions due to NOx RACT.

2.3.4 NOx OTC 2001 Model Rule for ICI Boilers

The Ozone Transport Commission (OTC) developed control measures for industrial, commercial, and institutional (ICI) boilers in 2001. Information about the proposed OTC NOx emission limits by fuel type and size range was obtained from Table III-1 of *Control Measure Development Support Analysis of Ozone Transport Commission Model Rules* (E.H. Pechan & Associates, Inc., March 31, 2001). Information about the emission limits contained in the existing state rules (prior to adoption of the OTC 2001 model rule) were obtained from Tables III-2 through III-9 of the Pechan document. Information about the emission limits contained in the current state rules (as they existed in June 2006) were obtained from the individual states regulations. The percent reduction for ICI boilers was estimated by state, fuel type, and size range by comparing the current state emission limits (as they existed in June 2006) with the state emission limits as they existed in 2001. Pennsylvania adopted the OTC 2001 model rule in five southeastern counties (Bucks, Chester, Delaware, Montgomery, and Philadelphia) for boilers in the 100 to 250 million Btu/hour range. New Jersey adopted the OTC 2001 model rule for natural gas-fired boilers with a maximum heat rate of at least 100 million Btu/hour. For other states, it did not appear that the emission limits in 2006 had changed from the emission limits in 2001.

2.3.5 2-, 4-, 7-, and 10-year MACT Standards

Maximum achievable control technology (MACT) requirements were also applied, as documented in the report entitled *Control Packet Development and Data Sources,* dated July 14, 2004 (available at http://www.epa.gov/air/interstateairquality/pdfs/Non-EGU_nonpoint_Control_Development.pdf). The point source MACTs and associated emission reductions were designed from Federal Register (FR) notices and discussions with EPA's Emission Standards Division (ESD) staff. These MACT requirements apply only to units located at a major source of hazardous air pollutants (HAP). We did not apply reductions for MACT standards with an initial compliance date of 2002 or earlier, assuming that the effects of these controls are already accounted for in the inventories supplied by the States. Emission reductions were applied only for MACT standards with an initial compliance date of 2003 or greater.

Because the MANE-VU inventory does not identify HAP major sources, the reductions from post-2002 MACT standards were applied on a more general scale to all sources with certain SCCs. Every source with an SCC determined to be affected by a post-2002 MACT standard was assigned an incremental percent reduction for the applicable MACT standard. Table B-4 shows the SCCs affected and the incremental control efficiencies applied for post-2002 MACT standards.

2.3.6 Combustion Turbine and RICE MACT

The MANE-VU projection inventory does not include the NOx co-benefit effects of the MACT regulations for Gas Turbines or stationary Reciprocating Internal Combustion Engines, which EPA estimates to be small compared to the overall inventory.

2.3.7 Industrial Boiler/Process Heater MACT

EPA anticipates ancillary reductions in PM and SO2 as a result of the Industrial Boiler/Process Heater MACT standard. The MACT applies to industrial, commercial, and institutional units firing solid fuel (coal, wood, waste, biomass) which have a design capacity greater than 10 mmBtu/hr and are located at a major source of hazardous air pollutants (HAP). The boiler design capacity field in many cases was missing from the MANE-VU emission inventory. In lieu of boiler design capacity, we identified boilers with the following SCCs that emitted greater than 10 tons/year of either SO2 or PM10

- 1-02-001-xx Industrial, Anthracite Coal
- 1-02-002-xx Industrial, Bituminous/subbituminous Coal
- 1-02-008-xx Industrial, Petroleum Coke
- 1-02-009-xx Industrial, Wood/Bark Waste
- 1-03-001-xx Commercial/Institutional, Anthracite Coal
- 1-03-002-xx Commercial/Institutional, Bituminous/subbituminous Coal
- 1-03-009-xx Commercial/Institutional, Wood/Bark Waste
- 3-90-002-89 In-Process Fuel Use, Bituminous Coal
- 3-90-002-99 In-Process Fuel Use, Bituminous Coal
- 3-90-008-89 In-Process Fuel Use, Coke
- 3-90-008-99 In-Process Fuel Use, Coke
- 3-90-009-99 In-Process Fuel Use, Wood

For these sources, we applied the average MACT control efficiencies of 4% for SO2 and 40% for PM.

2.3.8 Refinery Enforcement Initiative

Both EPA and State/local agencies have negotiated (or are in the process of negotiating) Consent Decrees that will require significant investment in pollution control technology and will result in significant emission reductions in the future. There are eight refineries in the MANE-VU inventory impacted by the settlements. The five major refinery processes that are affected by the judicial settlements are:

- Fluid Catalytic Cracking Units (FCCUs) and Fluid Coking Units (FCUs)
- Process Heaters and Boilers
- Flare Gas Recovery
- Leak Detection and Repair
- Benzene/Wastewater

As part of the development of the *Assessment of Control Technology Options for Petroleum Refineries in the Mid-Atlantic Region* (Draft Final, October 2006), MACTEC coordinated with State and local agencies to develop estimates of future year emissions based upon the settlements and recent permits that implement the provisions of those settlements.

For FCCUs/FCUs, the Consent Decree control requirements generally require the installation of wet gas scrubbers for SO2 control. Some of the units have already been permitted to include the control requirements. In those cases, specific emission limits for SO2 have already been established and were used as the best estimate of emission in 2009. In cases where specific emission limitation have not yet been specified in permits, a 90 percent SO2 control efficiency was assumed as a conservative estimate of the SO2 reductions from the installation of a wet gas scrubber.

For NOx control at FCCUs/FCUs, the Consent Decrees require selective catalytic reduction (SCR), selective non-catalytic reduction (SCNR), or optimization studies to reduce NOx emissions. Some of the units have already been permitted to include the control requirements. In those cases, specific emission limits for NOx have already been established and were used as the best estimate of emission in 2009. In cases where specific emission limitation have not yet been specified in permits, a 90 percent NOx control efficiency was assumed for SCR, and a 60 percent reduction was assumed from the installation of SNCR.

For SO2 emissions from boilers/heaters, the control requirements generally require the elimination of burning solid/liquid fuels. We identified all boilers and heaters at the eight affected refineries that burn solid or liquid fuels. For these units, we set the SO2 emissions to zero in the future year inventories.

For NOx emissions from boilers/heaters, control requirements generally apply to units greater than 40 million British thermal units (MMBtu) per hour capacity or larger. In many cases, the consent decrees establish NO_x emission reduction objectives across a number of refineries that are owned by the same firm. Therefore, the companies have some discretion in deciding which individual boilers/heaters to control as well as the control techniques to apply. Also, the consent decrees have various phase-in dates which make it difficult to determine the exact date when the reductions will be fully realized. As part of the development of the *Assessment of Control Technology Options for Petroleum Refineries in the Mid-Atlantic Region* (Draft Final, October 2006), MACTEC coordinated with State and local agencies to develop estimates of future year emissions based upon the settlements and recent permits that implement the provisions of those settlements. Heater/boiler NOx controls for the units to which they are applied were determined to be equivalent to meeting a 0.04 lbs per million Btu NOx emission rate. Meeting this emission reduction requirement is expected to provide an average NOx emission reduction of 50 percent from 2002 levels in 2009.

The Consent Decrees also included enhanced LDAR programs (e.g., reducing the defined leak concentration, increasing the monitoring frequency, other requirements. Our best estimate is a 50% reduction in VOC emissions as a result of implementing enhanced LDAR programs similar to those required in the recent Consent Decrees. This is based on a study (http://www.rti.org/pubs/ertc_enviro_2002_final1.pdf) that estimated an enhanced LDAR program could result in a 50% reduction in fugitive VOCs.

The settlements are expected to produce additional SO2, NOx, and VOC emission reductions for flare gas recovery and wastewater operations. These emission reductions were not quantified as they are expected to produce less significant changes in the MANE-VU inventory because of the magnitude and uncertainty associated with the emissions from these units in the 2002 MANE-VU inventory.

2.3.9 Source Shutdowns

A few states indicated that significant source shutdowns have occurred since 2002 and that emissions from these sources should not be included in the future year inventories. These sources are identified in Table B-5.

2.3.10 State Specific Control Factors

Delaware provided reductions expected from the Maritrans lightering operation. VOC emissions are projected to be reduced by 34.8% by 2009, 69.3% by 2012, and 79.2% by 2018.

2.4 NONEGU POINT SOURCE QA/QC REVIEW

Throughout the inventory development process, quality assurance steps were performed to ensure that no double counting of emissions occurred, and to ensure that a full and complete inventory was developed. Quality assurance was an important component to the inventory development process and MACTEC performed the following QA steps on the nonEGU point source component of the MANE-VU future year inventories:

1. State agencies reviewed the draft growth and control factors in the summer of 2005. Changes based on these comments were implemented in the files.

2. Compared, at the emission unit-level, emissions from the IPM parsed files and the MANE-VU NIF files to verify that the splitting of the MANE-VU point source inventory into the EGU and nonEGU sectors did not result in any double county of emissions or cause units to be missing from both inventories.

3. SCC level emission summaries were prepared and evaluated to ensure that emissions were consistent and that there were no missing sources. Tier comparisons (by pollutant) were developed between the revised 2002 base year inventory and the 2009/2012/2018 projection inventories.

4. State level emission summaries were prepared and evaluated to ensure that emissions were consistent and reasonable. The summaries included base year 2002 emissions, 2009/2012/2018 projected emissions accounting only for growth, 2009/2012/2018 projected emissions accounting for both growth and emission reductions from OTB and OTW controls.

5. Emission inventory files in NIF format were provided for state agency review and comment. Changes based on these comments were implemented.

6. All final files were run through EPA's Format and Content checking software.

7. Version numbering was used for all inventory files developed. The version numbering process used a decimal system to track major and minor changes. For example, a major change would result in a version going from 1.0 to 2.0 for example. A minor change would cause a version number to go from 1.0 to 1.1. Minor changes resulting from largely editorial changes would result in a change from 1.00 to 1.01 for example.

Final QA checks were run on the revised projection inventory data set to ensure that all corrections provided by the S/L agencies and stakeholders were correctly incorporated into the S/L inventories and that there were no remaining QA issues that could be addressed during the duration of the project. After exporting the inventory to ASCII text files in NIF 3.0, the EPA QA program was run on the ASCII files and the QA output was reviewed to verify that all QA issues that could be addressed were resolved

2.5 NONEGU POINT SOURCE NIF AND SMOKE FILES

The Version 3 file names and descriptions delivered to MARAMA are shown in Table 2-1.

2.6 NONEGU POINT SOURCE EMISSION SUMMARIES

Emission summaries by state, year, and pollutant are presented in Tables 2-2 through 2-8 for CO, NH3, NOx, PM10-PRI, PM25-PRI, SO2, and VOC, respectively.

Table 2-1 NonEGU Point Source NIF, IDA, and Summary File Names

File Name	Date	Description
MANEVU_OTB2009_NonEGU_NIFV3_1.mdb	Dec. 4, 2006	Version 3.1 of 2009 OTB NonEGU source NIF inventory
MANEVU_OTB2012_NonEGU_NIFV3_1.mdb	Dec. 4, 2006	Version 3.1 of 2012 OTB NonEGU source NIF inventory
MANEVU_OTB2018_NonEGU_NIFV3_1.mdb	Dec. 4, 2006	Version 3.1 of 2018 OTB NonEGU source NIF inventory
MANEVU_OTB2009_NonEGU_IDAV3_1.txt	Nov. 22, 2006	Version 3.1 of 2009 OTB NonEGU source inventory in SMOKE IDA format
MANEVU_OTB2012_NonEGU_IDAV3_1.txt	Nov. 22, 2006	Version 3.1 of 2012 OTB NonEGU source inventory in SMOKE IDA format
MANEVU_OTB2018_NonEGU_IDA3V_2.txt	Nov. 22, 2006	Version 3.1 of 2018 OTB NonEGU source inventory in SMOKE IDA format
MANEVU OTB BOTW NonEGU V3_1 State Summary.xls	Nov. 22, 2006	Spreadsheet with state totals by pollutant for all NonEGU sources
MANEVU OTB BOTW NonEGU V3_1 State SCC Summary.xls	Dec. 4, 2006	Spreadsheet with SCC totals by state and pollutant for all NonEGU sources.

Table 2-2 NonEGU Point Sources
OTB/OTW Annual CO Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	2,157	2,251	2,306	2,415
DE	8,812	9,037	8,748	8,651
DC	247	283	299	327
ME	9,043	10,147	10,467	11,433
MD	94,536	104,012	111,174	141,342
MA	10,793	12,027	12,552	13,426
NH	774	858	871	907
NJ	8,209	10,076	10,806	12,244
NY	53,259	61,411	65,541	78,876
PA	105,815	116,430	121,251	140,909
RI	1,712	1,764	1,821	1,927
VT	220	250	254	267
Total	**295,577**	**328,546**	**346,090**	**412,724**

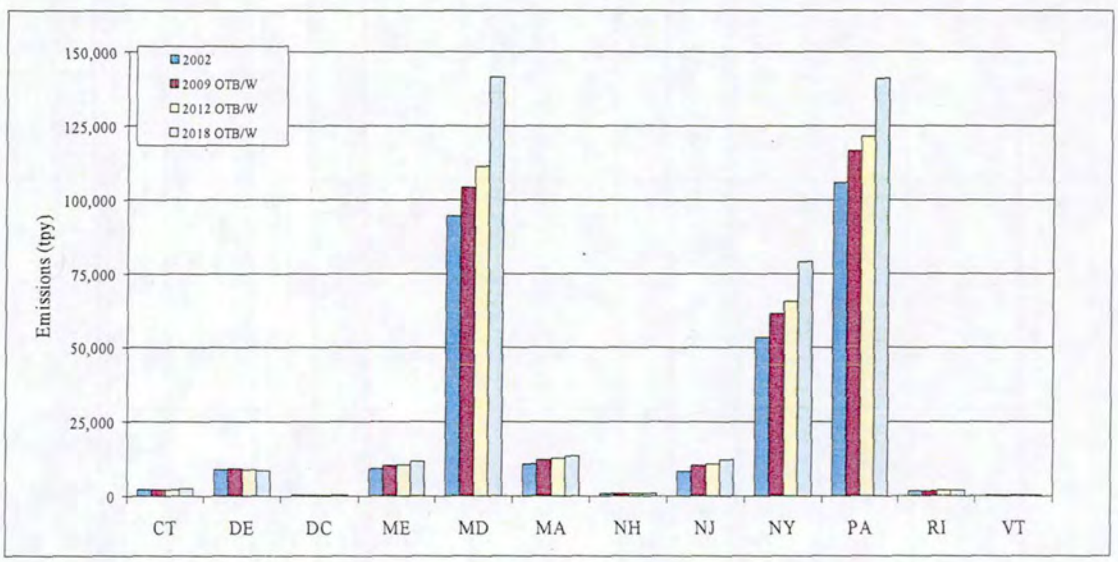


Table 2-3 NonEGU Point Sources
OTB/OTW Annual NH3 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	0	0	0	0
DE	153	145	138	134
DC	4	5	5	5
ME	700	796	809	859
MD	305	347	366	410
MA	462	510	521	563
NH	37	46	50	60
NJ	0	0	0	0
NY	1,027	1,081	1,128	1,296
PA	1,170	1,307	1,363	1,591
RI	58	64	68	68
VT	0	0	0	0
Total	**3,916**	**4,301**	**4,448**	**4,986**

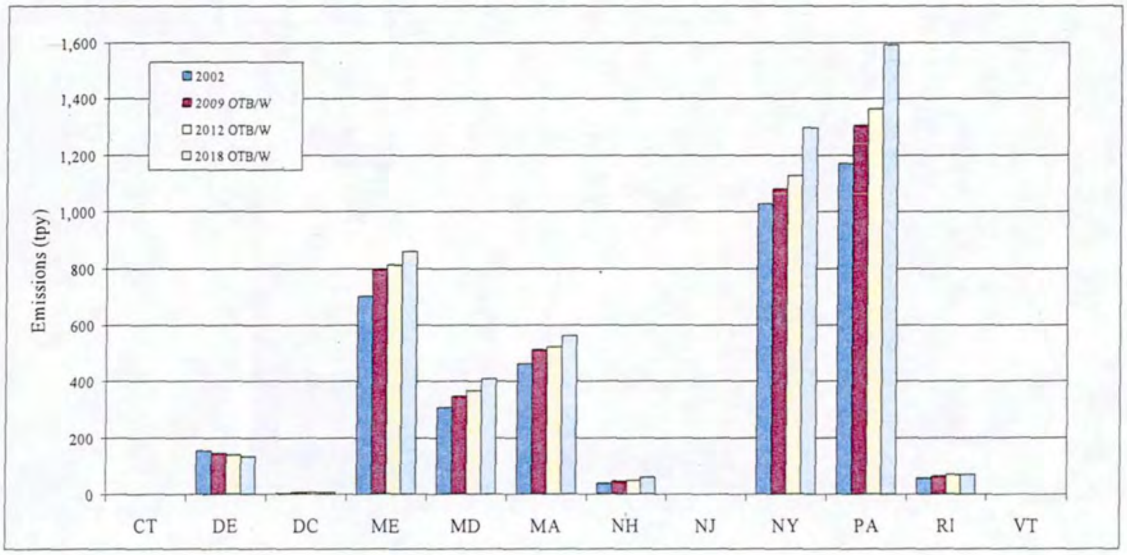


Table 2-4 NonEGU Point Sources
OTB/OTW Annual NOx Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	6,773	7,236	7,465	7,921
DE	4,372	4,076	4,135	4,246
DC	480	548	577	627
ME	12,108	14,285	14,661	15,753
MD	21,940	19,401	20,399	22,797
MA	18,292	20,603	21,372	23,040
NH	1,188	1,384	1,394	1,435
NJ	15,812	16,498	17,091	18,805
NY	34,253	33,648	34,586	37,133
PA	89,136	89,932	93,526	103,137
RI	2,308	2,449	2,471	2,442
VT	386	462	460	466
Total	**207,048**	**210,522**	**218,137**	**237,802**

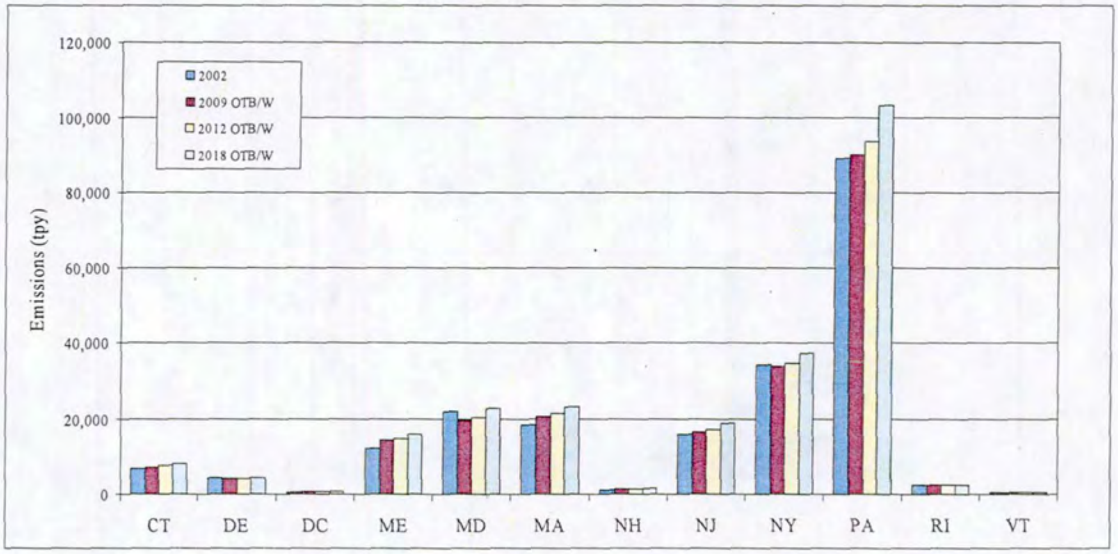


Table 2-5 NonEGU Point Sources
OTB/OTW Annual PM10-PRI Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	990	1,035	1,058	1,106
DE	1,820	1,486	1,475	1,487
DC	157	178	186	198
ME	6,120	7,088	7,133	7,496
MD	4,739	4,797	5,040	5,828
MA	4,212	5,006	5,088	5,314
NH	918	1,084	1,097	1,129
NJ	3,439	4,205	4,417	4,959
NY	5,072	5,221	5,444	6,098
PA	23,282	25,169	26,307	29,516
RI	296	333	331	330
VT	235	267	272	296
Total	**51,280**	**55,869**	**57,848**	**63,757**

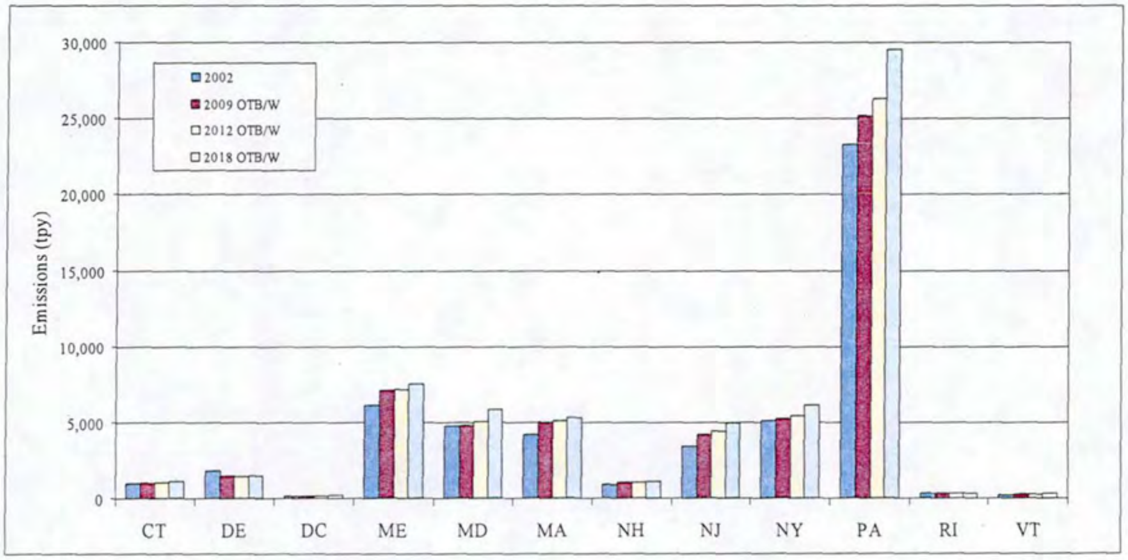


Table 2-6 NonEGU Point Sources
OTB/OTW Annual PM25-PRI Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	822	871	894	939
DE	1,606	1,256	1,245	1,254
DC	128	145	152	164
ME	4,899	5,675	5,690	5,935
MD	2,772	2,861	3,011	3,503
MA	2,953	3,554	3,574	3,660
NH	857	1,008	1,021	1,052
NJ	2,947	3,588	3,764	4,234
NY	3,355	3,535	3,688	4,161
PA	12,360	13,578	14,159	15,878
RI	180	200	198	194
VT	198	226	229	246
Total	**33,077**	**36,497**	**37,625**	**41,220**

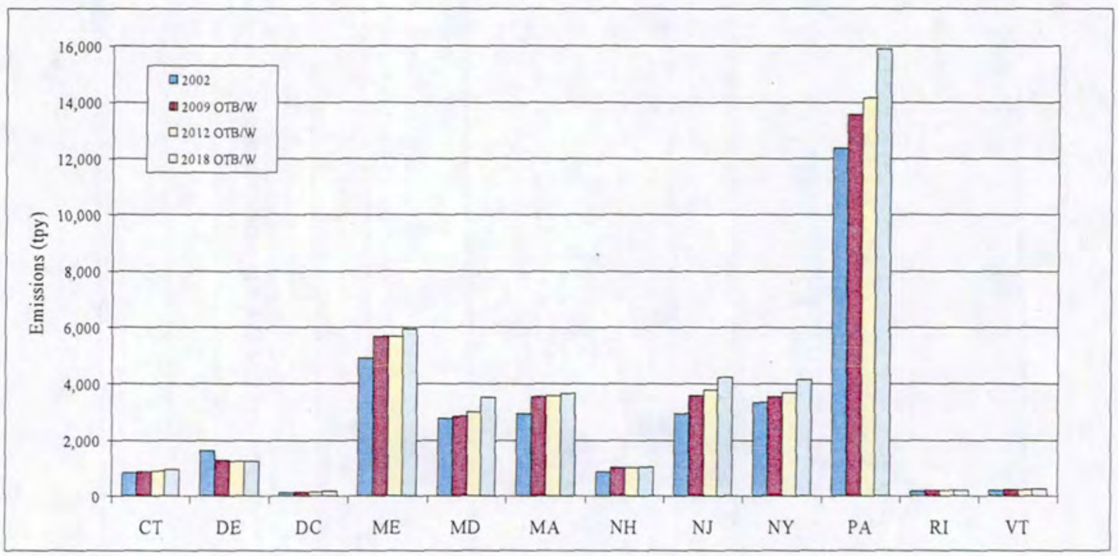


Table 2-7 NonEGU Point Sources
OTB/OTW Annual SO2 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	2,438	2,528	2,567	2,644
DE	35,706	7,117	7,401	7,610
DC	618	707	735	780
ME	14,412	18,656	18,492	18,794
MD	34,193	34,223	35,373	38,921
MA	14,766	18,185	18,442	18,955
NH	2,436	3,099	3,098	3,114
NJ	9,797	7,141	7,234	7,856
NY	58,227	62,922	64,484	67,545
PA	88,259	90,735	93,441	99,924
RI	2,651	3,163	3,182	3,164
VT	874	1,182	1,147	1,127
Total	**264,377**	**249,658**	**255,596**	**270,434**

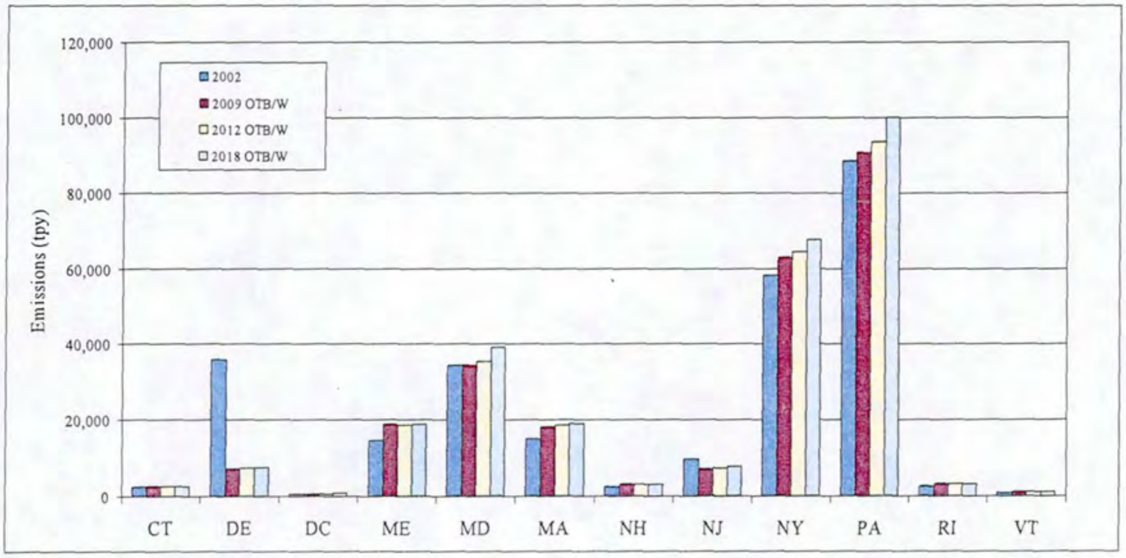
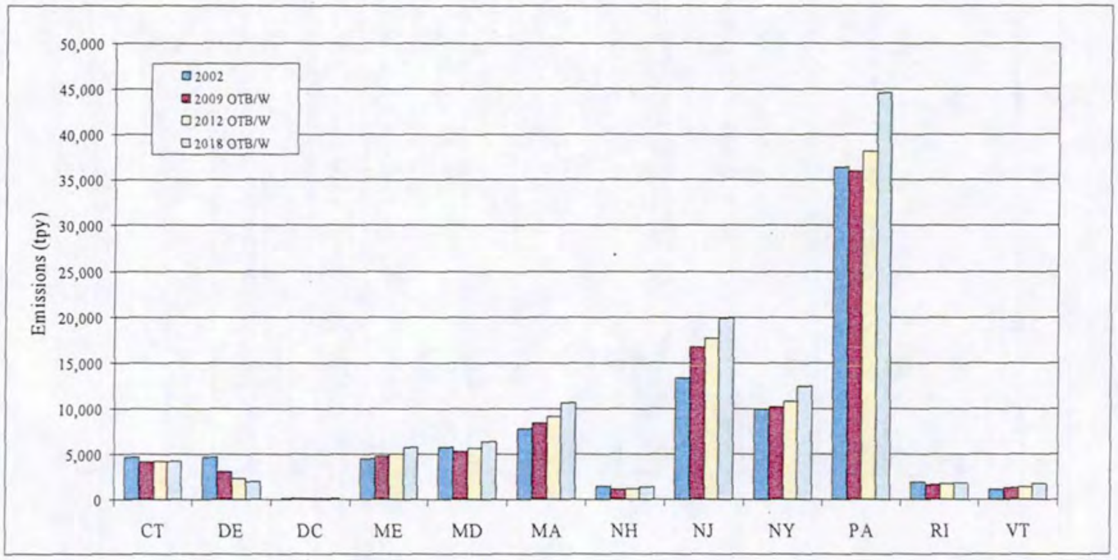


Table 2-8 NonEGU Point Sources
OTB/OTW Annual VOC Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	4,604	4,114	4,152	4,230
DE	4,645	2,987	2,311	1,993
DC	69	72	75	85
ME	4,477	4,740	4,985	5,709
MD	5,676	5,297	5,578	6,301
MA	7,794	8,381	9,061	10,564
NH	1,459	1,060	1,132	1,294
NJ	13,318	16,702	17,621	19,915
NY	9,933	10,157	10,750	12,354
PA	36,326	35,875	38,162	44,537
RI	1,898	1,640	1,695	1,812
VT	1,079	1,254	1,365	1,730
Total	**91,278**	**92,279**	**96,887**	**110,524**



3.0 AREA SOURCES

The area source sector is comprised of stationary sources that are small and numerous, and that have not been inventoried individually as specific point, mobile, or biogenic sources. Individual sources are typically grouped with other like sources into area source categories and the emissions are calculated on a county-by-county basis. Area source categories include residential/commercial/industrial fuel combustion; small industrial processes; solvent utilization (such as architectural coatings and consumer products); petroleum product storage and transport (such as gasoline service stations); waste disposal; and agricultural activities.

The procedures for projecting emissions for area sources are described in this section. We started with the MANE-VU 2002 area source emission inventory. We first applied growth factors to account for changes in population and economic activity. Next, we applied control factors to account for future emission reductions from on-the-books (OTB) control regulations and on-the-way (OTW) control regulations. The OTB control scenario accounts for post-2002 emission reductions from promulgated federal, State, local, and site-specific control programs as of June 15, 2005. The OTW control scenario accounts for proposed (but not final) control programs that are reasonably anticipated to result in post-2002 emission reductions. We then conducted a series of quality assurance steps to ensure the development of complete, accurate, and consistent emission inventories. We provided the inventories in three formats – the National Emission Inventory Input Format (NIF), SMOKE Inventory Data Analyzer (IDA) format, and SMOKE growth/control packets. We also prepared emission summary tables by state and pollutant. Each of these activities is discussed in this section.

3.1 INITIAL 2002 AREA SOURCE EMISSION INVENTORY

The starting point for the area source projections was Version 3 of the MANE-VU 2002 area source emission inventory (MANE-VU_2002_Area_040606.MDB). There were two updates to this version of the 2002 inventory in response to requests from the District of Columbia and Massachusetts. These changes, described in the following paragraphs, were used in preparing the 2009/2012/2018 projections.

After release of Version 3 of the MANE-VU 2002 inventory, the District of Columbia discovered a gross error in the 2002 residential, non-residential and roadway construction. They requested that the following values be used for the 2002 base year and as the basis for the 2009/2012/2018 projections:

SCC	Pollutant Code	2002 Annual Emissions (tpy)
2311010000	PM10-PRI	8.2933
	PM25-PRI	1.6587
2311020000	PM10-PRI	486.1951
	PM25-PRI	97.239
2311030000	PM10-PRI	289.8579
	PM25-PRI	57.9716

After release of Version 3 of the MANE-VU 2002 inventory, Massachusetts revised their inventory of area source heating oil emissions due to two changes: (1) SO2 emission factors were adjusted for the sulfur content from 1.0 to 0.03; and (2) use of the latest DOE-EIA 2002 fuel use data instead of the previous version used 2001. These two changes significantly altered the 2002 SO2 emissions for area source heating oil combustion. Massachusetts provided revised 2002 PE and EM tables, which MACTEC used in preparing the 2009/2012/2018 projection inventories.

3.2 AREA SOURCE GROWTH FACTORS

The area source growth factors were developed using three sets of data:

- The U.S. EPA's Economic Growth and Analysis System Version 5.0 (EGAS 5.0) using the default SCC configuration. EGAS 5.0 generates growth factors from REMI's 53 Sector Policy Insight Model Version 5.5, the U.S. Department of Energy (DOE) Annual Energy Outlook 2004 (AEO2004) fuel use projections, and national vehicle mile travel projections from EPA's MOBILE 4.1 Fuel Combustion Model;
- The DOE's Annual Energy Outlook 2005 (AEO2005) fuel consumption forecasts were used to replace the AEO2004 forecasts that are used as the default values in EGAS 5.0; and
- State-supplied population, employment, and other emission projection data.

The priority for applying these growth factors was to first use the state-supplied projection data (if available). If no state-supplied data are available, then we used the AEO2005 projection factors for fuel consumption sources. If data from these two sources were not available, we used the EGAS 5.0 default SCC configuration. Appendix C lists the area source growth factors used for this study.

3.2.1 EGAS 5.0 Growth Factors

EGAS is an EPA-developed economic and activity forecast tool that provides credible growth factors for developing emission inventory projections. Growth factors are generated using national- and regional-economic forecasts. For nonEGUs, the primary economic activity data sets in EGAS 5.0 are:

- State-specific growth rates from the Regional Economic Model, Inc. (REMI) Policy Insight® model, version 5.5. The REMI socioeconomic data (output by industry sector, population, farm sector value added, and gasoline and oil expenditures) are available by 4-digit SIC code at the State level.
- Energy consumption data from the DOE's Energy Information Administration's (EIA) *Annual Energy Outlook 2004, with Projections through 2025* for use in generating growth factors for non-EGU fuel combustion sources. These data include regional or national fuel-use forecast data that were mapped to specific SCCs for the non-EGU fuel use sectors (e.g., commercial coal, industrial natural gas). Growth factors are reported at the Census division level. These Census divisions represent a group of States (e.g., the South Atlantic division includes Delaware, the District of Columbia, and Maryland; the Middle Atlantic division includes New Jersey, New York, and Pennsylvania; the New England division includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont). Although one might expect different growth rates in each of these States due to unique demographic and socioeconomic trends, all States within each division received the same growth rate.

EGAS uses these economic activity datasets and a set of cross-reference files to generate growth factors by Standard Industrial Classification (SIC) code, Source Classification Code (SCC), or Maximum Achievable Control Technology (MACT) codes. Growth factors for 2009, 2012, and 2018 were calculated using 2002 as the base year at the State and SCC level. County-specific growth factors are not available in EGAS 5.0.

There were several SCCs in the MANE-VU 2002 inventory that are not included in the EGAS 5.0 files. As a result, EGAS did not generate growth factors for those SCCs. MACTEC assigned growth factors for the missing SCCs by assigning a surrogate SCC that best represented the missing SCC.

3.2.2 AEO2005 Growth Factors

The default version of EGAS 5.0 uses the DOE's AEO2004 forecasts. We replaced these data with the more recent AEO2005 forecasts to improve the emissions growth factors produced. Using ACCESS, we created a copy of the "DOE EGAS 5" dataset. The dataset includes three tables. One table contains the projection data values from 2001-2025. The other two tables are the MACT and SCC crosswalk tables. The crosswalk tables are linked to the projection table via a "model code". Using the copy of AEO2004 data, we updated the corresponding projection tables with data from the AEO2005 located at: http://www.eia.doe.gov/oiaf/aeo/supplement/supref.html . Using the data and descriptions from the new tables, we matched the projection data to the appropriate model codes and then built a table identical to the DOE EGAS 5 dataset with the new 2005 AEO data. The resulting ACCESS dataset contains a projection data table with the exact same structure as the original except with the new data. The SCC and MACT crosswalks did not require any updates since the model code assignments were not changed in the new data table.

3.2.3 State Specific Growth Factors

In addition to the growth data described above, we received growth projections from several MANE-VU states to be used instead of the default EGAS or AEO2005 growth factors. The following paragraphs describe the area source growth factors used for each state.

3.2.3.1 Connecticut

Connecticut provided state-level population projections for 2009, 2012, and 2018. We created growth factors for those SCCs that are population based using the state-supplied data. Connecticut also provided state-level employment projections for industry categories analogous to 2-digit SIC codes. Projections were provided for 2009, 2012, and 2018. We matched these industry groupings to SCC codes in order to create SCC specific growth factors for area sources. Emissions from area source fuel combustion were projected using the AEO2005 forecasts.

3.2.3.2 Delaware

Delaware provided county-level population projections (*Delaware Population Consortium Annual Population Projections*, Oct 18, 2001 Version 2001.0) for 2000, 2005, 2010, 2015, and 2020. We interpolated these data to get growth factors for projection from 2002 to 2009, 2012, and 2018 for those SCCs that are population based. Delaware also provided state-level employment data by NAICS codes for 2002 and 2012. We interpolated values for 2009 and 2018. We matched these industry groupings to SCC codes in order to create SCC specific growth factors for selected area sources. Emissions from area source fuel combustion were projected using the AEO2005 forecasts.

3.2.3.3 District of Columbia

DC provided local growth factors for projecting emissions from 2002 to 2009, 2012, and 2018 for all area source SCCs except fuel combustion sources. Emissions from area source fuel combustion were projected using the AEO2005 forecasts.

3.2.3.4 Maine

Maine indicated that it preferred to use the EGAS 5.0 growth factors and the DOE's 2005 Annual Energy Outlook data for combustion sources.

3.2.3.5 Maryland

Maryland provided growth factors by SCC for all counties in the State. These growth factors were derived from a variety source sources, including the MWCOG Cooperative Forecast 7.0, the BMC Round 6A Cooperative Forecast (prepared by the MD Dept. of Planning, May 2004), and EGAS 5.0.

3.2.3.6 Massachusetts

Massachusetts provided county-level population data for the years 2000, 2010, and 2020. We interpolated these data to get growth factors for projection from 2002 to 2009, 2012, and 2018 for those SCCs that are population based. Massachusetts also provided growth factors for several SCCs based on employment data for the years 2000 and 2010. We interpolated these data to get growth factors for projection from 2002 to 2009, 2012, and 2018. Massachusetts agreed on the use of the AEO2005 forecasts for projecting emissions from area source fuel combustion.

3.2.3.7 New Hampshire

New Hampshire agreed to use the EGAS 5.0 growth factors, with the enhancement of using the DOE's 2005 Annual Energy Outlook data for combustion sources.

3.2.3.8 New Jersey

New Jersey provided growth factors for most SCCs for all counties in the State. When state-specific growth factors were not available, we used the AEO2005 forecasts for projecting emissions from area source fuel combustion and EGAS default factors for any remaining categories.

3.2.3.9 New York

New York provided county-level population data for 2002 and projections/growth factors for 2009, 2012, and 2018. We used these growth factors for those SCCs that are population based. We used the AEO2005 forecasts for projecting emissions from area source fuel combustion and EGAS default factors for any remaining categories.

3.2.3.10 Pennsylvania

Pennsylvania provided county-level population data for 2000 and projections for 2010 and 2020. We interpolated these data to get growth factors for projecting from 2002 to 2009, 2012, and 2018 for those SCCs that are population based. Pennsylvania also provided general employment data for 21 counties or area for 2000 and projections for 2010 and 2020. We interpolated these data to get growth factors for projecting from 2002 to 2009, 2012, and 2018 for nine area source categories identified by Pennsylvania. For all other area source categories, we used the AEO2005 forecasts for projecting emissions from area source fuel combustion and EGAS default factors for any remaining categories.

3.2.3.11 Rhode Island

Rhode Island provided county-level population projections for 2000, 2005, 2010, 2015, and 2020. We interpolated these data to get growth factors for projection from 2002 to 2009, 2012, and 2018 for those SCCs that are population based. Rhode Island provided state-level employment data from the Department of Labor and Training by 3-digit NAICS codes for 2002 and 2012. We used these data to calculate the growth factor from 2002 to 2012 and interpolated these data to derive growth factors for 2009 and 2018. We matched these industry NAICS groupings to SCC codes in order to create SCC specific growth factors for area sources. Rhode Island agreed on the use of the AEO2005 forecasts for projecting emissions from area source fuel combustion.

3.2.3.12 Vermont

Vermont agreed to use the EGAS 5.0 growth factors, with the enhancement of using the DOE's 2005 Annual Energy Outlook data for combustion sources.

3.3 AREA SOURCE CONTROL FACTORS

We developed control factors to estimate emission reductions that will result from on-the-books regulations that will result in post-2002 emission reductions and proposed regulations or actions that will result in post-2002 reductions. Control factors were developed for the following national or regional control measures:

- OTC VOC Model Rules
- Federal On-board Vapor Recovery
- New Jersey Post-2002 Area Source Controls
- Residential Woodstove NSPS

3.3.1 OTC 2001 VOC Model Rules

Most of the MANE-VU States have adopted (or will soon adopt) the Ozone Transport Commission (OTC) model rules for five area source VOC categories: consumer products, architectural and industrial maintenance (AIM) coatings, portable fuel containers, mobile equipment repair and refinishing (MERR), and solvent cleaning. Information on the percent reduction anticipated by each model rule was obtained from Table II-6 of *Control Measure Development Support Analysis of Ozone Transport Commission Model Rules* (E.H. Pechan & Associates, Inc., March 31, 2001). This set of model rules will be referred to as the "OTC 2001 model rules" in this document. Information as to whether a particular state has adopted (or will soon adopt) a particular measure was obtained form the Status Report on OTC States' Efforts to Promulgate Regulations Based on OTC Model Rules (As of June 1, 2005, as posted on the OTC web site). For all categories, except portable fuel containers (see discussion below), we assumed that the rules would be fully implemented by <u>all states by 2009</u>. Some states had already adopted some the OTC 2001 Model Rules in 2002 or already had similar rules in place in 2002. The 2002 emission inventory for those states already reflected the emission reductions expected from the OTC 2001 Model Rule level of control. For those states and categories, no incremental reductions were applied for to the future year projections, as indicated Table 3-1.

For consumer products, the 2001 OTC model rule was estimated to provide a 14.2 percent VOC emissions reductions from the Federal Part 59 rule. Most, but not all, states in the OTR have adopted the OTC 2001 model rule for consumer products. For this inventory, it was assumed that all OTC states would adopt the 2001 OTC model rule prior to 2009. Thus, the 14.2 percent control factor was applied uniformly to all states in the 2009, 2012, and 2018 projection inventories.

For AIM coatings, the 2001 OTC model rule was estimated to provide a 31 percent VOC emissions reduction from the Federal Part 59 rule. Most, but not all, states in the OTR have adopted the OTC 2001 model rule for AIM coatings. For this inventory, it was assumed that all OTC states would adopt the 2001 OTC model rule prior to 2009. Thus, this control factor was applied uniformly to all states, with one exception. Maine adopted the OTC model rule with an alternative VOC content limit for varnishes and interior wood clear and semitransparent wood stains. As a result, Maine estimated that reductions from AIM coatings should be modeled using a 29.5 percent control factor instead of the 31 percent estimated for the OTC 2001 model rule.

For portable fuel containers, the 2001 OTC model rule was estimated to provide a 75 percent reduction in VOC emissions at the end of an assumed 10-year phase-in period as

Table 3-1 Adoption Matrix for 2001 OTC Model Rules

State	Consumer Products	AIM Coatings	Portable Fuel Containers	Mobile Equipment Repair and Refinishing	Solvent Cleaning
CT	Yes	Yes	Yes	Yes	Yes
DE	Yes	Yes	Yes	Yes	No
DC	Yes	Yes	Yes	Yes	No
ME	Yes	Yes	Yes	Yes	Yes
MD	Yes	Yes	Yes	No	No
MA	Yes	Yes	Yes	No	* (7%)
NH	Yes	Yes	Yes	Yes	Yes
NJ	Yes	Yes	Yes	Yes	** (17%)
NY	Yes	Yes	Yes	Yes	Yes
PA	Yes	Yes	Yes	No	No
RI	Yes	Yes	Yes	Yes	Yes
VT	Yes	Yes	Yes	Yes	No

Yes – apply incremental reductions in future years
No – OTC Model Rule reductions already accounted for in 2002 inventory; no incremental reductions applied to future years.
* MA is amending its existing Solvent/Degreasing rule and anticipates a 7% reduction from 2002 levels.
** NJ amended its existing Solvent/Degreasing rule and anticipates a 17% reduction from 2002 levels

older non-compliant containers are replaced with new compliant containers. The rule penetration (RP) depends on the assumed PFC estimated useful life and how quickly old non-compliant containers are replaced with new compliant containers. For the 2001 OTC model rule, the turnover from old to new containers is expected to be 10 percent per year. The MANEVU states have adopted the OTC 2001 model rule at different times, so the rule penetration will vary by State depending upon when the rule became effective in a given state. For example, compliant containers were required in Pennsylvania beginning on January 1, 2003. By the 2009 ozone season, there will be a 6.5 year turnover period for compliant PFCs in Pennsylvania. By contrast, compliant containers in New Jersey were not required until January 1, 2005. Thus, by the 2009 ozone season, there will be a 4.5 year turnover period for compliant PFCs. Table 3.2 shows the effective date for compliant containers by state, along with the rule penetration factors and overall control efficiency. There are different rule penetration factors for the three inventory years because of the increased penetration of compliant containers into the marketplace. By 2018, 100 percent compliance is assumed.

Table 3-2 Rule Penetration and Control Efficiency Values for 2001 OTC Model Rule for PFCs

Rule Compliance Date	States with this Compliance Date	Control Efficiency (%)	Rule Penetration (%)	Overall Control Efficiency (%)
Control Factor for 2009 Inventory				
2003	MD, NY, PA	75	65	48.8
2004	CT, DE, DC, ME	75	55	41.3
2005	NJ	75	45	33.8
2006	NH	75	35	26.3
2007*	MA, RI, VT	75	25	18.8
Control Factor for 2012 Inventory				
2003	MD, NY, PA	75	95	71.3
2004	CT, DE, DC, ME	75	85	63.8
2005	NJ	75	75	56.3
2006	NH	75	65	48.8
2007*	MA, RI, VT	75	55	41.3
Control Factor for 2018 Inventory				
2003	MD, NY, PA	75	100	75.0
2004	CT, DE, DC, ME	75	100	75.0
2005	NJ	75	100	75.0
2006	NH	75	100	75.0
2007*	MA, RI, VT	75	100	75.0

* The 2001 OTC model rule is not yet effective. It was assumed to become effective January 1, 2007 for the MANEVU modeling inventory. Massachusetts' rule actually will not become effective until 2009 and is based only on the OTC 2006 model rule; Massachusetts will not adopt the OTC 2001 model rule.

The emission reductions from the 2001 OTC PFC model rule were calculated only for the emissions accounted for in the area source inventory. Additional benefits (not estimated for this report) would be expected from equipment refueling vapor displacement and spillage that is accounted for in the nonroad inventory.

For mobile equipment repair and refinishing, the 2001 OTC model rule was estimated to provide a 38 percent VOC emissions reductions from the Federal Part 59 rule (35% for paint application and 3% for cleaning operations). Most, but not all, states in the OTR have adopted the OTC 2001 model rule for MERR or already had similar rules in effect in

2002. For this inventory, it was assumed that all OTC states would adopt the 2001 OTC model rule prior to 2009 or have similar rules in effect. For those states (MD, MA, PA) that had similar rules in effect in 2002 or earlier, no incremental reductions were applied since it was assumed that the effects of the state rule were already accounted for in the 2002 inventory. New Jersey indicated that a 19 percent control factor should be used for VOC emissions from MERR in New Jersey. For all other states, the OTC 2001 Model Rule control factor of 38 percent was applied.

For solvent cleaning, the 2001 OTC model rule was estimated to provide a 66 percent VOC emissions reductions. Most, but not all, states in the OTR have adopted the OTC 2001 model rule for solvent cleaning or already had similar rules in effect in 2002. For this inventory, it was assumed that all OTC states would adopt the 2001 OTC model rule prior to 2009 or have similar rules in effect. For those states (DE, DC, MD, PA, VT) that had similar rules in effect in 2002 or earlier, no incremental reductions were applied since it was assumed that the effects of the state rule were already accounted for in the 2002 inventory. Massachusetts indicated that some portion of the reductions resulting from the OTC 2001 model rule were already accounted for in their 2002 emissions, but that the state anticipated an additional 7 percent reduction from anticipated amendments. New Jersey indicated that a 17 percent control factor should be used for VOC emissions from solvent cleaning in New Jersey. For all other states (CT, ME, NH, NY, RI), the OTC 2001 Model Rule control factor of 66 percent was applied.

Table D-1 in Appendix D shows the anticipated percent reductions by state, SCC, and year from implementation of the OTC 2001 VOC Model Rules.

3.3.2 On-Board Vapor Recovery

The U.S. EPA issued regulations requiring onboard vapor recovery (ORVR) standards for the control of vehicle refueling emissions in 1994. ORVR works by routing refueling vapors to a carbon canister on the vehicle and are expected to achieve from 95-98 percent reduction in VOC emissions for those vehicles equipped with ORVR. ORVR is required to be installed on some new light-duty gasoline vehicles in 1998, and all new light-and medium-duty automobiles and trucks will be required to have ORVR installed by 2006.

For the Lake Michigan Air Directors Consortium, E.H. Pechan made estimates of emission reductions as they grow over time due to increased rule penetration. The following discussion describes how the on-board vapor recovery control factors were developed (email from Maureen Mullen, E.H. Pechan):

"Onroad refueling control factors were calculated based on the percentage difference between the projection year (2007, 2008, 2009, 2012, and 2018) MOBILE6 refueling emission factors and the 2002 MOBILE6 refueling emission factors.

MOBILE6 emission factors were calculated at January and July temperature and fuel conditions. July emission factors were used as the surrogate for the five-month ozone season (May through September) and the January emission factors were used as the surrogates for the remaining seven months. Temperatures modeled were the January and July average daily monthly maximum and minimum temperatures for each State, based on 30-year average temperature data, as used in EPA's second Section 812 Prospective analysis. Within a State, MOBILE6 input files were created for each unique combination of: January and July RVP, RFG, oxygenated fuel, and Stage II control programs. Fuel data was based on 2002 data, also as used in the Section 812 analysis. Information on Stage II control programs and control efficiencies were provided by EPA, as included in the draft 2002 NEI. Using these same temperature inputs, fuel inputs, and Stage II control inputs (where applicable), Pechan calculated MOBILE6 emission factors for calendar years 2002, 2007, 2008, 2009, 2012, and 2018.

The resulting MOBILE6 emission factors were first weighted according to the default MOBILE6 VMT mix to determine the weighted average refueling emission factor for all gasoline vehicle types. The resulting January and July emission factors were weighted together according to the number of days in the seven-month season (212 days) and the five-month ozone season (153). After this was done for all of the modeled years and State or sub-State areas, the overall control efficiency for refueling, due to fleet turnover, was calculated based on the percentage difference between the 2002 and corresponding projection year emission factors. These control efficiencies were then assigned to individual counties, based on the mapping of fuel and Stage II control parameters to those modeled in the MOBILE6 files."

These projections were made on a county-by-county basis. Table D-2 shows the anticipated percent reductions by county, SCC, and year.

3.3.3 Post-2002 Area Source Controls in New Jersey

New Jersey made gasoline transfer provision amendments at N.J.A.C. 7:27-16.3. The Stage I portion of the amendments are expected to result in emissions reductions of 23.2 percent from the 2002 baseline. This is based on a control efficiency of 29 percent and a rule effectiveness of 80 percent. The State II portion of the amendments are already incorporated into the inventory through the MOBILE6 inputs.

New Jersey also made amendments to ICI boiler provisions at N.J.A.C. The amendments require any ICI boiler has a maximum gross heat input rate of at least 5 mmBTU/hour, whether or not it is located at a major NO_x facility, to conduct annual tune-ups. In the support documentation for this rule amendment, New Jersey estimated that the tune-ups would result in a 25 percent reduction in NOx emissions.

3.3.4 Residential Wood Combustion

Control factors were evaluated to account for the replacement of retired woodstoves that emit at pre-new source performance standard (NSPS) levels. We used EPA's latest methodology provided by Marc Houyoux of EPA/OAQPS. This methodology uses a combination growth and control factor and is based on activity not pollutant. The growth and control are accounted for in a single factor the SCCs split out the controlled and uncontrolled equipment. The control is indirectly incorporated based on which stove is used. The combined growth and control rates are as follows:

- Fireplaces increase 1%/yr
- Old woodstoves (non-EPA certified) decrease 2%/yr
- New woodstoves (EPA certified) increase 2%/yr

The data to support these rates were collected as part of the woodstove change-out program development in OAQPS. Table D-3 shows the anticipated percent changes by SCC and year.

3.4 AREA SOURCE QA/QC REVIEW

Throughout the inventory development process, quality assurance steps were performed to ensure that no double counting of emissions occurred, to ensure that a full and complete inventory was developed for MANE-VU, and to make sure that projection calculations were working correctly. Quality assurance was an important component to the inventory development process and MACTEC performed the following QA steps on the area source components of the 2009/2012/2018 projection inventories:

1. State agencies reviewed the draft growth and control factors in the summer of 2005. Changes based on these comments were implemented in the files.
2. SCC level emission summaries were prepared and evaluated to ensure that emissions were consistent and that there were no missing sources. Tier comparisons (by pollutant) were developed between the revised 2002 base year inventory and the 2009/2012/2018 projection inventories.
3. Emission inventory files in NIF format were provided for state agency review and comment. Changes based on these comments were implemented.
4. All final files were run through EPA's Format and Content checking software.

3.5 AREA SOURCE NIF, SMOKE AND SUMMARY FILES

The Version 3 file names and descriptions delivered to MARAMA are shown in Table 3-3.

3.6 AREA SOURCE EMISSION SUMMARIES

Emission summaries by state, year, and pollutant are presented in Tables 3-4 through 3-10 for CO, NH3, NOx, PM10-PRI, PM25-PRI, SO2, and VOC, respectively.

Table 3-3 Area Source NIF, IDA, and Summary File Names

File Name	Date	Description
MANEVU_OTB2009_Area_NIFV3_2.mdb	Nov. 9, 2006	Version 3.2 of 2009 OTB area source NIF inventory
MANEVU_OTB2012_Area_NIFV3_2.mdb	Nov. 9, 2006	Version 3.2 of 2012 OTB area source NIF inventory
MANEVU_OTB2018_Area_NIFV3_2.mdb	Nov. 9, 2006	Version 3.2 of 2018 OTB area source NIF inventory
MANEVU_OTB2009_Area_IDAV3_2.txt	Nov. 20, 2006	Version 3.2 of 2009 OTB area source inventory in SMOKE IDA format
MANEVU_OTB2012_Area_IDAV3_2.txt	Nov. 20, 2006	Version 3.2 of 2012 OTB area source inventory in SMOKE IDA format
MANEVU_OTB2018_Area_IDA3V_2.txt	Nov. 20, 2006	Version 3.2 of 2018 OTB area source inventory in SMOKE IDA format
MANEVU OTB BOTW Area V3_2 State Summary.xls	Nov. 8, 2006	Spreadsheet with state totals by pollutant for all area sources
MANEVU OTB BOTW Area V3_2 State SCC Summary.xls	Nov. 8, 2006	Spreadsheet with SCC totals by state and pollutant for all area sources.

Table 3-4 Area Sources
OTB/OTW Annual CO Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	70,198	65,865	63,874	59,797
DE	14,052	15,395	15,233	14,864
DC	2,300	2,417	2,460	2,512
ME	109,223	102,743	99,877	94,181
MD	141,178	143,653	144,233	144,649
MA	137,496	132,797	130,255	125,205
NH	79,647	76,504	75,319	73,038
NJ	97,657	90,432	88,048	83,119
NY	356,254	336,576	327,118	307,659
PA	266,935	266,887	264,012	257,396
RI	8,007	8,007	8,026	8,024
VT	43,849	42,683	42,172	41,283
Total	**1,326,796**	**1,283,959**	**1,260,627**	**1,211,727**

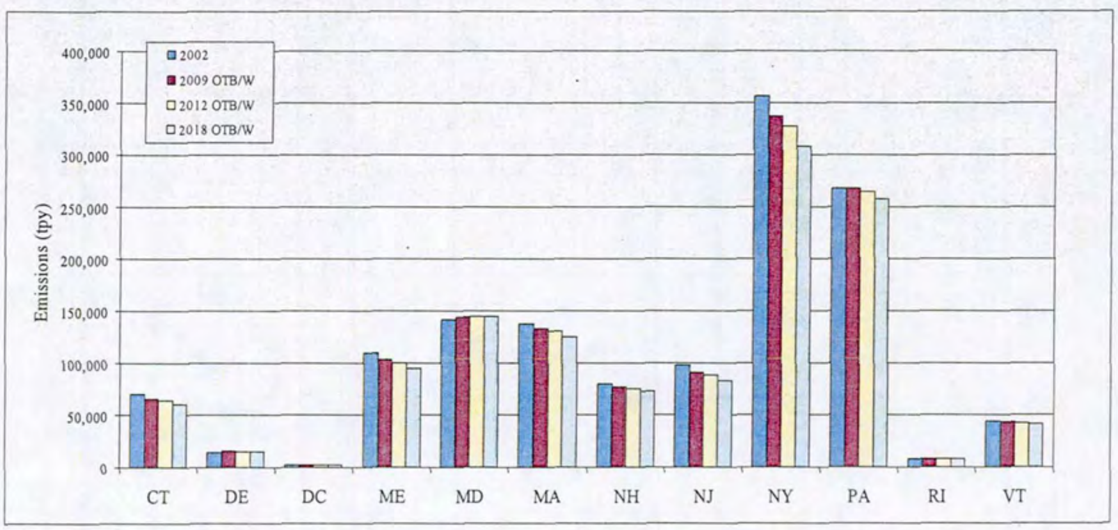


Table 3-5 Area Sources
OTB/OTW Annual NH3 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	5,318	5,208	5,156	5,061
DE	13,279	13,316	13,328	13,342
DC	14	16	16	17
ME	8,747	10,453	11,116	12,312
MD	25,834	31,879	34,222	38,155
MA	18,809	19,131	19,275	19,552
NH	2,158	2,466	2,584	2,789
NJ	17,572	19,457	20,154	21,435
NY	67,422	81,626	87,116	96,078
PA	79,911	98,281	105,418	117,400
RI	883	945	972	1,025
VT	9,848	12,156	13,062	14,580
Total	**249,795**	**294,934**	**312,419**	**341,746**

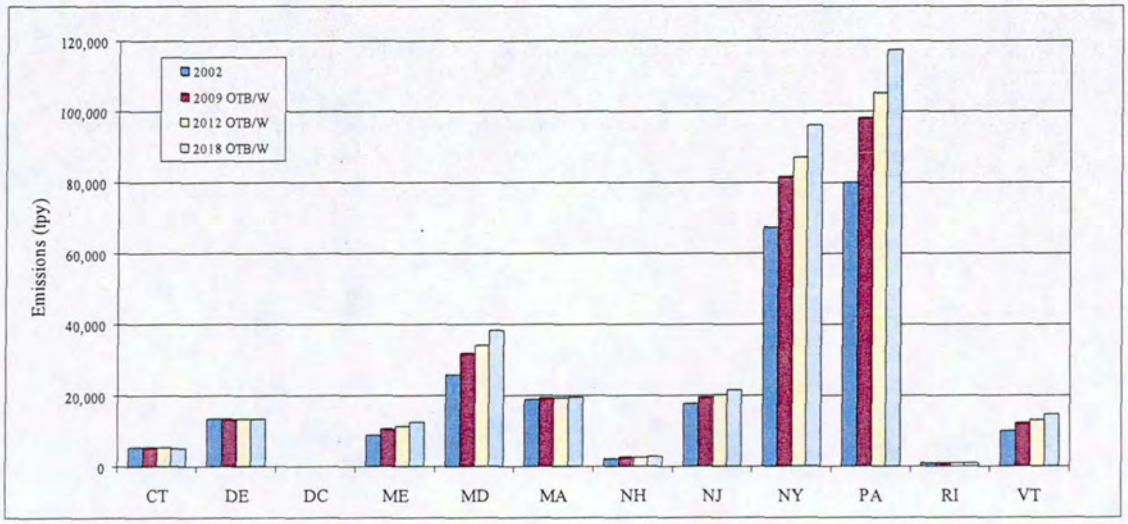


Table 3-6 Area Sources
OTB/OTW Annual NOx Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	12,689	13,173	13,342	13,388
DE	2,608	2,821	2,913	3,014
DC	1,644	1,961	2,081	2,259
ME	7,360	7,477	7,486	7,424
MD	15,678	16,858	17,315	18,073
MA	34,281	35,732	36,331	37,187
NH	10,960	11,879	12,055	12,430
NJ	26,692	24,032	23,981	23,660
NY	98,803	106,375	107,673	108,444
PA	47,591	50,162	50,793	50,829
RI	3,886	4,149	4,260	4,397
VT	3,208	3,419	3,429	3,430
Total	**265,400**	**278,038**	**281,659**	**284,535**

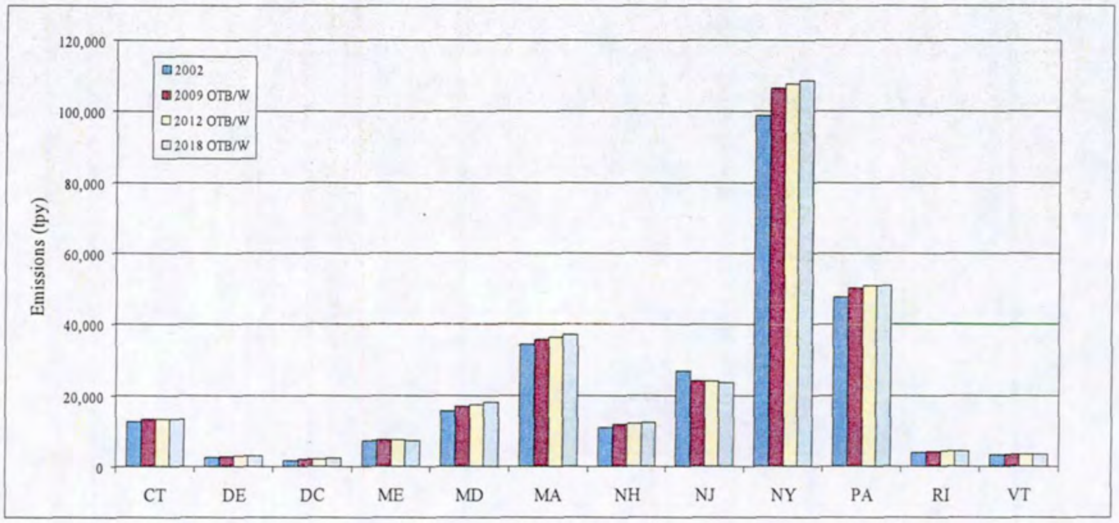


Table 3-7 Area Sources
OTB/OTW Annual PM10-PRI Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	48,281	48,970	49,004	49,479
DE	13,039	13,928	14,236	14,844
DC	3,269	3,511	3,605	3,825
ME	168,953	175,979	179,689	189,619
MD	95,060	105,944	110,141	117,396
MA	192,860	198,668	200,692	204,922
NH	43,328	46,060	47,187	49,801
NJ	61,601	61,684	61,284	60,880
NY	369,595	382,124	385,925	392,027
PA	391,897	421,235	432,844	454,970
RI	8,295	8,962	9,244	9,797
VT	56,131	60,521	62,465	66,916
Total	**1,452,309**	**1,527,586**	**1,556,316**	**1,614,476**

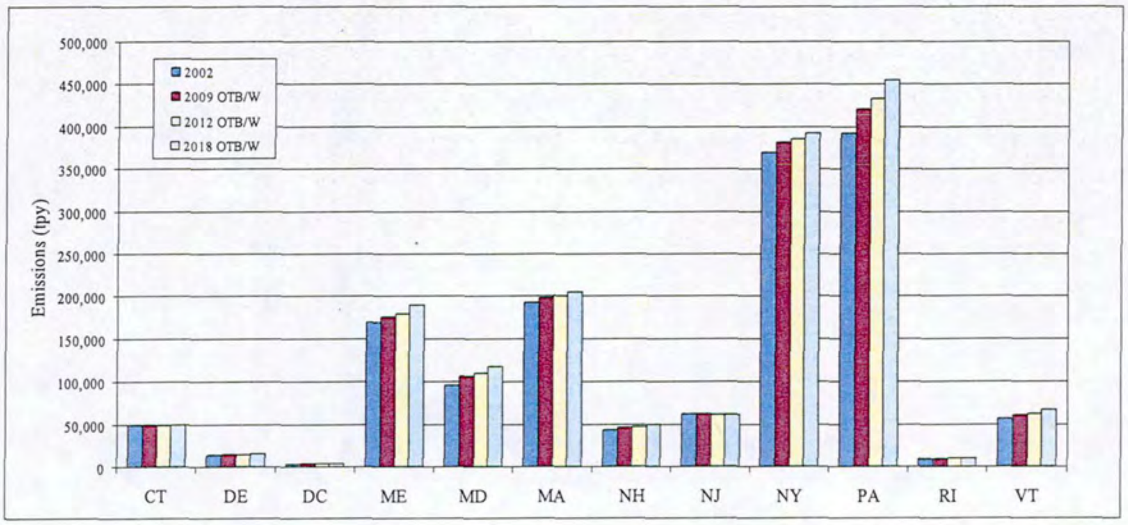


Table 3-8 Area Sources
OTB/OTW Annual PM25-PRI Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	14,247	13,766	13,517	13,033
DE	3,204	3,387	3,403	3,426
DC	805	860	879	917
ME	32,774	33,026	33,189	33,820
MD	27,318	28,923	29,508	30,449
MA	42,083	43,121	43,186	43,438
NH	17,532	17,965	18,050	18,316
NJ	19,350	18,590	18,271	17,653
NY	87,154	87,576	87,260	86,422
PA	74,925	79,169	80,728	83,570
RI	2,064	2,184	2,232	2,316
VT	11,065	11,482	11,652	12,059
Total	**332,521**	**340,049**	**341,875**	**345,419**

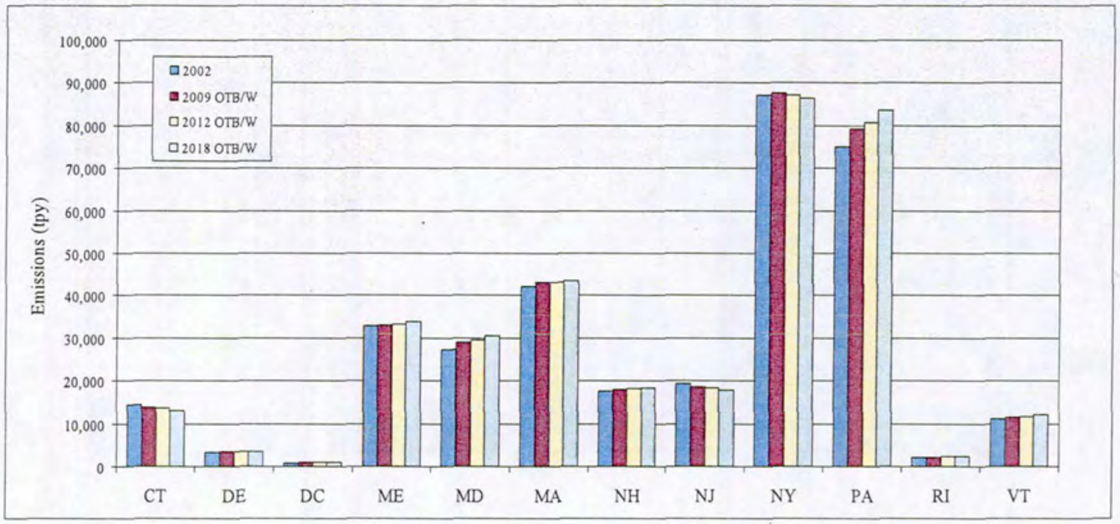


Table 3-9 Area Sources
OTB/OTW Annual SO2 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	12,418	12,581	12,604	12,184
DE	1,588	1,599	1,602	1,545
DC	1,337	1,487	1,541	1,632
ME	13,149	13,776	13,846	13,901
MD	12,393	13,685	14,074	14,741
MA	25,488	25,961	26,029	25,570
NH	7,072	7,463	7,470	7,421
NJ	10,744	10,672	10,697	10,510
NY	130,409	139,589	140,154	141,408
PA	63,679	67,535	67,446	66,363
RI	4,557	5,024	5,189	5,398
VT	4,087	4,646	4,687	4,764
Total	**286,921**	**304,018**	**305,339**	**305,437**

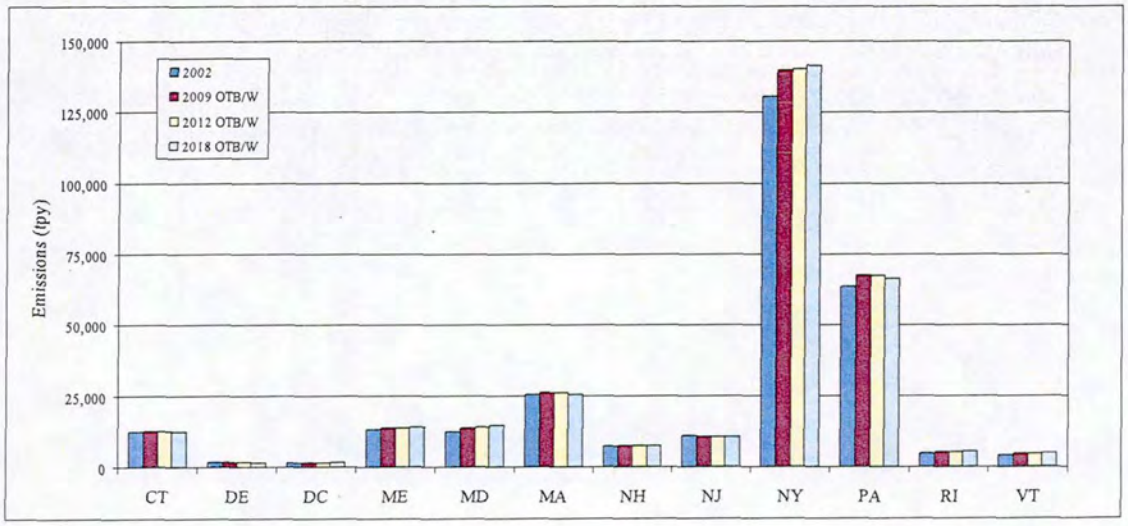
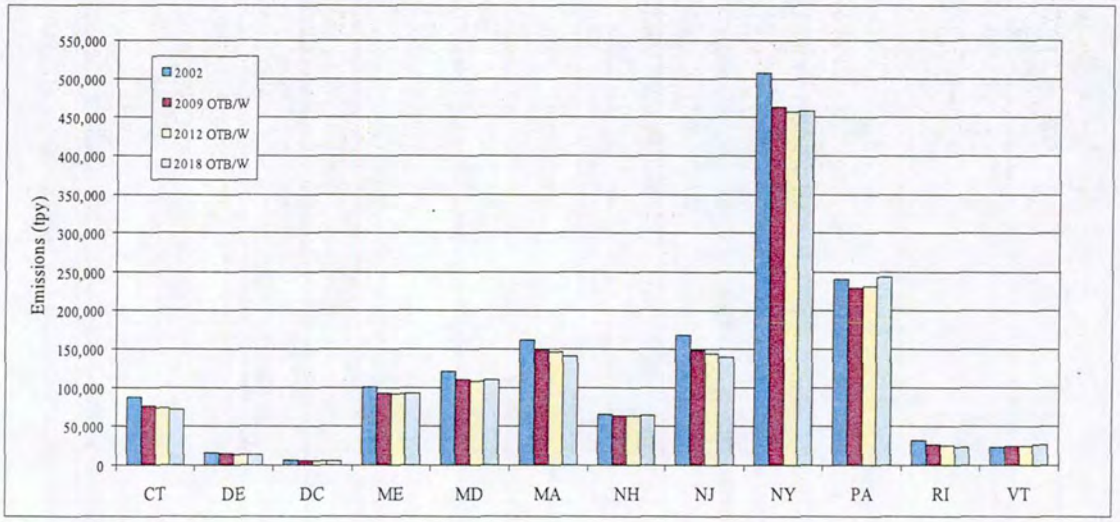


Table 3-10 Area Sources
OTB/OTW Annual VOC Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	87,302	75,693	73,560	71,274
DE	15,519	14,245	13,943	13,744
DC	6,432	5,420	5,352	5,255
ME	100,621	91,910	91,667	92,410
MD	120,254	110,385	108,067	110,046
MA	162,145	148,625	145,674	140,558
NH	65,370	63,069	63,356	64,368
NJ	167,882	147,617	143,752	139,626
NY	507,292	462,811	456,856	457,421
PA	240,785	228,444	230,393	243,421
RI	31,402	26,695	25,548	23,561
VT	23,265	24,068	24,635	26,198
Total	**1,528,269**	**1,398,982**	**1,382,803**	**1,387,882**



4.0 NONROAD SOURCES

The nonroad source sector is comprised of nonroad engines included in EPA's NONROAD model, as well as other nonroad engines not accounted for in the NONROAD model, including aircraft, commercial marine vessels, and locomotive engines. The sections that follow describe the projection process used to develop 2009/2012/2018 nonroad projection estimates for sources found in the NONROAD model and those sources estimated outside of the model (locomotives, airplanes and commercial marine vessels).

4.1 NONROAD MODEL SOURCES

NONROAD model source categories include equipment such as recreational boats and watercraft; recreational vehicles; farm, industrial, mining, and construction machinery; and lawn and garden equipment. Also included are aircraft ground support equipment and rail maintenance equipment. These equipment types are powered by engines using diesel, gasoline, compressed natural gas (CNG), and liquefied petroleum gas (LPG).

EPA released a revised version of NONROAD during December 2005 called NONROAD 2005. EPA's National Mobile Inventory Model (NMIM) is a consolidated modeling system that incorporates the NONROAD and MOBILE models, along with a county database of inputs. EPA also released an updated version of NMIM called NMIM2005, which incorporates the NONROAD2005 model.

MACTEC utilized the NMIM2005 model to develop projections for nonroad engines included in the NONROAD2005 model. Projected emission estimates were calculated using NMIM default data. Prior to starting the NMIM2005 runs, MACTEC confirmed with U.S. EPA's Office of Transportation and Air Quality (OTAQ) that the database used for fuel sulfur content, gas Reid Vapor Pressure (RVP) values and reformulated fuel programs was current and up to date for the MANE-VU region. The information received from OTAQ indicated that these values were the most current.

NMIM2005 runs were then developed for each projection year. These included 2009, 2012 and 2018. Emission calculations were made at the monthly level and consolidated to provide annual values. This enabled monthly temperatures and changes in reformulated gas to be captured by the program.

The NMIM/NONROAD2005 results in NIF 3.0, and ran EPA's QA checker program to verify that the NIF 3.0 files were properly constructed.

4.2 AIRCRAFT, COMMERCIAL MARINE, AND LOCOMOTIVES

Since aircraft, commercial marine vessels, and locomotives are not included in the NONROAD model, emission projections for these sources were developed separately. The starting point for the emission projections was Version 3 of the MANE-VU 2002 Nonroad emission inventory (*Documentation of the MANE-VU 2002 Nonroad Sector Emission Inventory, Version 3, Draft Technical Memorandum*, March 2006).

MACTEC's approach to developing emission projections for these sources was to use combined growth and control factors developed from emission projections for U.S. EPA's Clean Air Interstate Rule (CAIR) development effort. MACTEC obtained emission projections developed for the CAIR rule. We then calculated the combined growth and control factors by determining the ratio of emissions between 2002 and each of the MANE-VU projection years (2009, 2012, and 2018). The CAIR emissions were available for 2001, 2010, 2015 and 2020. Thus, we developed intermediate year estimates using linear interpolation between the actual CAIR years and the MANE-VU years.

Using this approach we developed State/county/SCC/pollutant growth/control factors for use in projecting the MANE-VU base year data to the year of interest. These values were then used to multiply times the base year value to obtain the projected values. Since the development of the CAIR factors included both growth and controls, no separate control factors were developed for these sources except where exceptions to this method were used for States that requested alternative growth/control methods (see below).

Once the CAIR factors were developed, MACTEC compared the SCCs contained in the CAIR inventory with those used in MANE-VU. In some cases there were differences. In cases where a similar SCC in the CAIR inventory could be assigned to the SCC in the MANE-VU inventory the State/County/SCC/pollutant growth and control factor for the substitute was assigned to the MANE-VU SCC. If no corresponding county SCC substitution could be found, a State or MANE-VU regional average value for the substitute SCC was developed and assigned for use in projecting emissions. The substitution scheme was to use State values first, then MANE-VU regional values if the State value couldn't be used.

This projection method was used with three exceptions. These exceptions were: 1) Maryland sources, 2) DC locomotive growth and controls and 3) Logan (Boston) airport. Each of these sources used alternative growth and/or controls provided by the States or developed from current Federal rules for these sources (applies to controls only). Each of these is discussed below.

4.2.1 Maryland Non-NONROAD Source Emissions

Maryland indicated that they would prefer to use EGAS growth factors coupled with Federal controls to determine projected emissions for these source categories. Maryland provided EGAS growth factors for use with these categories. Control values were developed based on Federal rules that were on the books.

For CMV, controls were developed based on data contained in Table 1.1-2 of the document "Final Regulatory Support Document: Control of Emissions from New Marine Compression-Ignition Engines at or Above 30 Liters per Cylinder," EPA420-R-03-004, January 2003. Values in that table were interpolated to develop emission estimates with and without controls for the MANE-VU years (and base year) and then control factors were calculated for those values. Only Category 3 marine engines were identified in the Maryland inventory and thus only NOx controls for those engines were developed.

For locomotives, control factors for different types of locomotives were developed using Tables 6-2 through 6-5 of the document "Locomotive Emission Standards: Regulatory Support Document," United States Environmental Protection Agency, Office of Mobile Sources, April 1998. Since these tables only showed PM controls, we assumed the same level of control for both PM-10 and PM-2.5. Controls for VOC, NOx and PM were developed using these tables.

In addition to engine specification controls for both CMV and locomotives, we also developed control factors resulting from changes to diesel fuel sulfur contents. The diesel fuel sulfur regulations were utilized to develop controls for SO2 and PM due solely to changing fuel sulfur requirements. Data from Tables 3.1-6a and 3.4-8a of the document "Final Regulatory Analysis: Control of Emissions from Nonroad Diesel Engines," EPA420-R-04-007, May 2004 were used to develop control levels created due to changes in fuel sulfur content. In cases where there were controls due to both engine technology and fuel sulfur reduction, we added the control efficiencies together to create a combined control efficiency. All control values are considered to be "additive". In other words, the controls applied are above those found in the base year. Thus the controls were used on the base year emission values without back-calculation to determine uncontrolled levels since the controls are in addition to those controls.

The control values were then applied along with the growth factors to the base year emissions for Maryland to produce the required emission projections.

4.2.2 DC Locomotive Emissions

The District of Columbia emission contact provided MACTEC with alternative growth factors for locomotive emissions. The growth factors provided were:

2002-2009	6.9%
2002-2012	9.9%
2002-2018	13.7%

Since the CAIR factors were combined growth and controls, the control factors developed for locomotives for Maryland (based on Federal control programs) were used to apply controls to the DC locomotive emissions. As was the case for Maryland, the control factors were "additive" and were used on the base year emission without back-calculating uncontrolled emissions since the control levels were relative to controls in place for 2002.

4.2.3 Logan (Boston) Airport Emissions

Massachusetts supplied historic and future year projections of operations at Logan Airport. The data covered the period 2000-2010. Since only one year of the period required for MANE-VU projections was included in that interval (2009), MACTEC developed estimates for 2012 and 2018 from those data by linear interpolation. Two linear interpolations were developed. The first used the entire data set (2000-2010) to develop a linear projection for 2012 and 2018 and a second using just the 2002-2010 data. For the final growth factors, MACTEC used the average of the two. These growth factors were then applied to commercial aircraft operations for Suffolk County (FIPS = 25025). The growth factors developed were:

2002-2009	1.184
2002-2012	1.22
2002-2018	1.33

No controls that would come on board for aircraft for the projection years were identified from a review of Federal programs.

4.3 NONROAD QA/QC REVIEW

Throughout the inventory development process, quality assurance steps were performed to ensure that no double counting of emissions occurred, to ensure that a full and complete inventory was developed for MANE-VU, and to make sure that projection calculations were working correctly. MACTEC performed the following QA steps on nonroad source projection inventories: (1) All final files (NONROAD only) were run through EPA's Format and Content checking software; SCC level emission summaries were prepared and evaluated to ensure that emissions were consistent with the 2002 projections and that there were no missing source categories or geographical areas.

4.4 NONROAD NIF, SMOKE, AND SUMMARY FILES

The Version 3.1 files delivered to MARAMA are shown in Table 4-1.

4.5 NONROAD EMISSION SUMMARIES

Table 4-2a shows the CO emissions by state and year for the entire nonroad sector. Table 4-2b presents the CO emission results for NONROAD model equipment only. Table 4-2c presents the CO emission results for only the aircraft, commercial marine vessel, and locomotive categories. Tables 4-3 to 4-8 present the emission results for the other criteria pollutants of interest.

Table 4-1 Nonroad Source NIF, IDA, and Summary File Names

File Name	Date	Description
MANEVU_OTB2009_NR_NIFV3_1.mdb	Oct. 23, 2006	Version 3.1 of 2009 nonroad source NIF inventory
MANEVU_OTB2012_NR_NIFV3_1.mdb	Oct. 23, 2006	Version 3.1 of 2012 nonroad source NIF inventory
MANEVU_OTB2018_NR_NIFV3_1.mdb	Oct. 23, 2006	Version 3.1 of 2018 nonroad source NIF inventory
MANEVU_OTB2009_NR_IDAV3_1.txt	Oct. 26, 2006	Version 3.1 of 2009 nonroad source inventory in SMOKE IDA format
MANEVU_OTB2012_NR_IDAV3_1.txt	Oct. 26, 2006	Version 3.1 of 2012 nonroad source inventory in SMOKE IDA format
MANEVU_OTB2018_NR_IDA3V_1.txt	Oct. 26, 2006	Version 3.1 of 2018 nonroad source inventory in SMOKE IDA format
MANEVU OTB Nonroad V3_1 State Summary.xls	Oct. 23, 2006	Spreadsheet with state totals by pollutant for all nonroad sources, NONROAD model sources, and aircraft, locomotives, and commercial marine vessels
MANEVU OTB Nonroad V3_1 State SCC Summary.xls	Oct. 23, 2006	Spreadsheet with SCC totals by state and pollutant for all nonroad sources, NONROAD model sources

Table 4-2a All Nonroad Sources
OTB/OTW Annual CO Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	276,773	282,788	288,061	303,764
DE	68,782	74,856	76,491	80,646
DC	18,845	20,746	21,306	22,429
ME	153,424	163,782	165,273	166,679
MD	437,400	497,276	513,737	550,795
MA	461,514	504,400	516,019	546,373
NH	130,782	142,318	143,804	147,544
NJ	704,396	753,916	777,069	831,880
NY	1,233,968	1,349,439	1,388,406	1,474,727
PA	931,978	1,031,816	1,058,256	1,119,247
RI	73,013	80,228	82,113	87,195
VT	62,248	68,360	69,003	70,074
Total	**4,553,124**	**4,969,925**	**5,099,538**	**5,401,353**

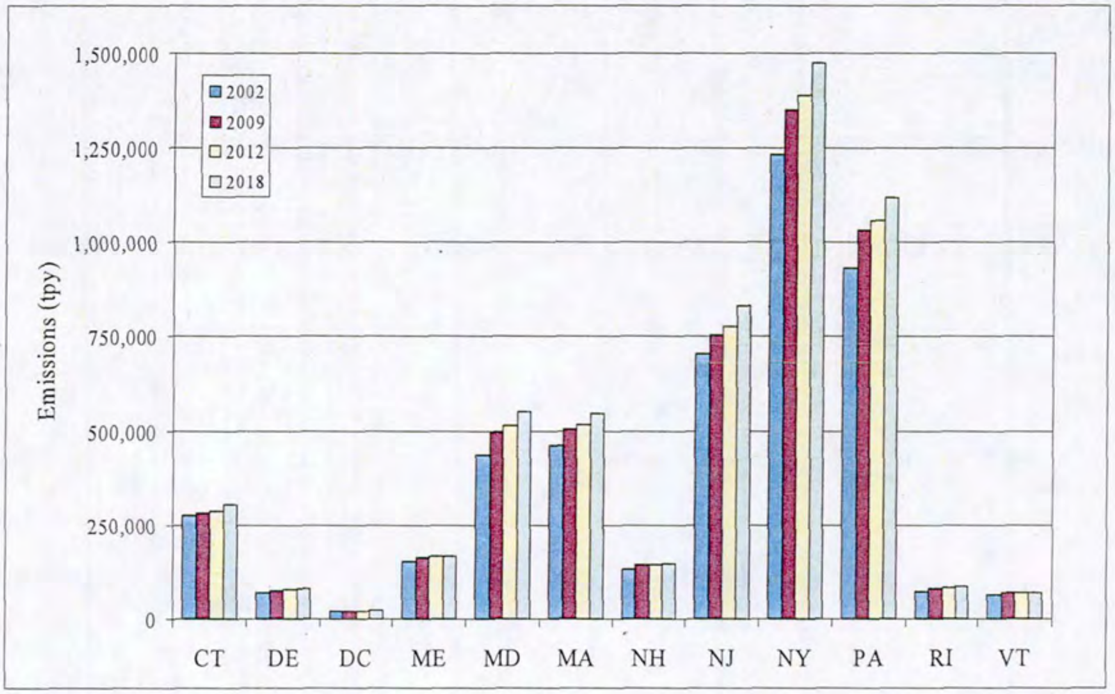


Table 4-2b NONROAD Model Sources
OTB/OTW Annual CO Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	274,388	280,253	285,415	300,931
DE	65,954	71,877	73,397	77,356
DC	18,775	20,671	21,229	22,350
ME	148,555	158,715	160,043	161,215
MD	424,777	482,312	497,806	532,970
MA	448,399	490,895	501,684	530,686
NH	128,572	139,288	140,655	144,191
NJ	692,548	741,792	764,424	818,519
NY	1,219,309	1,333,923	1,372,164	1,457,277
PA	903,168	1,003,480	1,029,045	1,088,614
RI	71,573	78,764	80,607	85,618
VT	61,732	67,802	68,421	69,456
Total	**4,457,748**	**4,869,771**	**4,994,890**	**5,289,186**

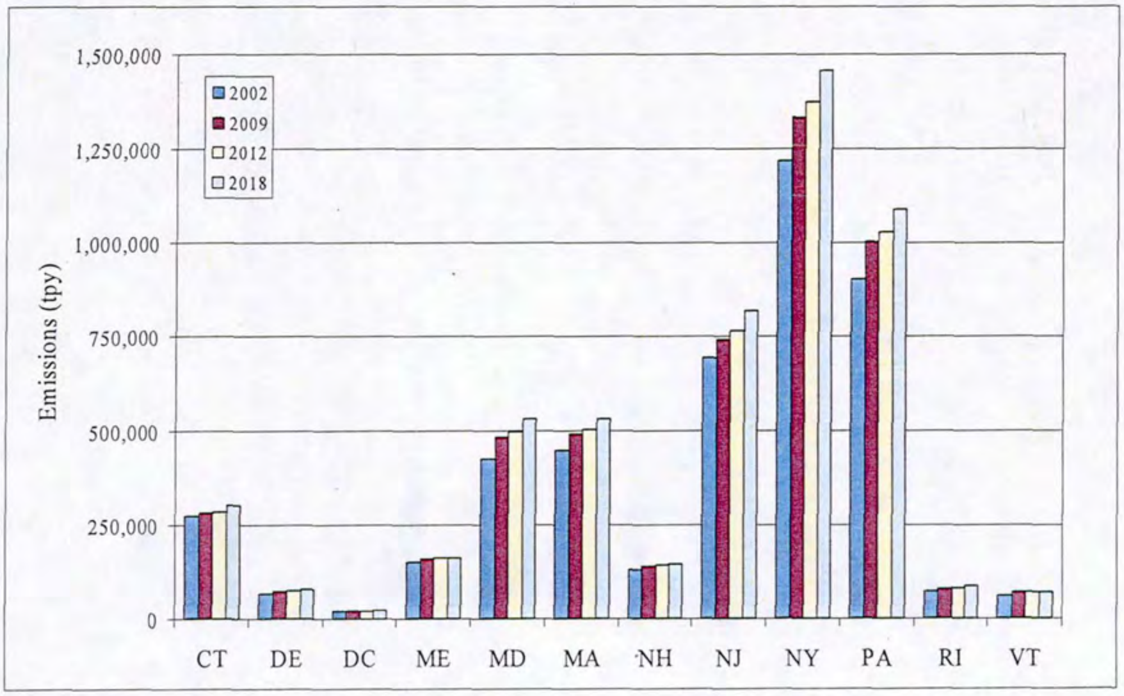


Table 4-2c Aircraft, Locomotive, and Commercial Marine Sources OTB/OTW Annual CO Emission Projections (tons per year)

State	2002	2009	2012	2018
CT	2,385	2,535	2,646	2,833
DE	2,828	2,979	3,094	3,290
DC	70	75	77	79
ME	4,868	5,067	5,230	5,464
MD	12,624	14,964	15,931	17,825
MA	13,116	13,505	14,335	15,687
NH	2,211	3,030	3,149	3,353
NJ	11,849	12,124	12,645	13,361
NY	14,660	15,516	16,242	17,450
PA	28,810	28,336	29,211	30,633
RI	1,440	1,464	1,506	1,577
VT	516	558	582	618
Total	**95,375**	**100,154**	**104,648**	**112,167**

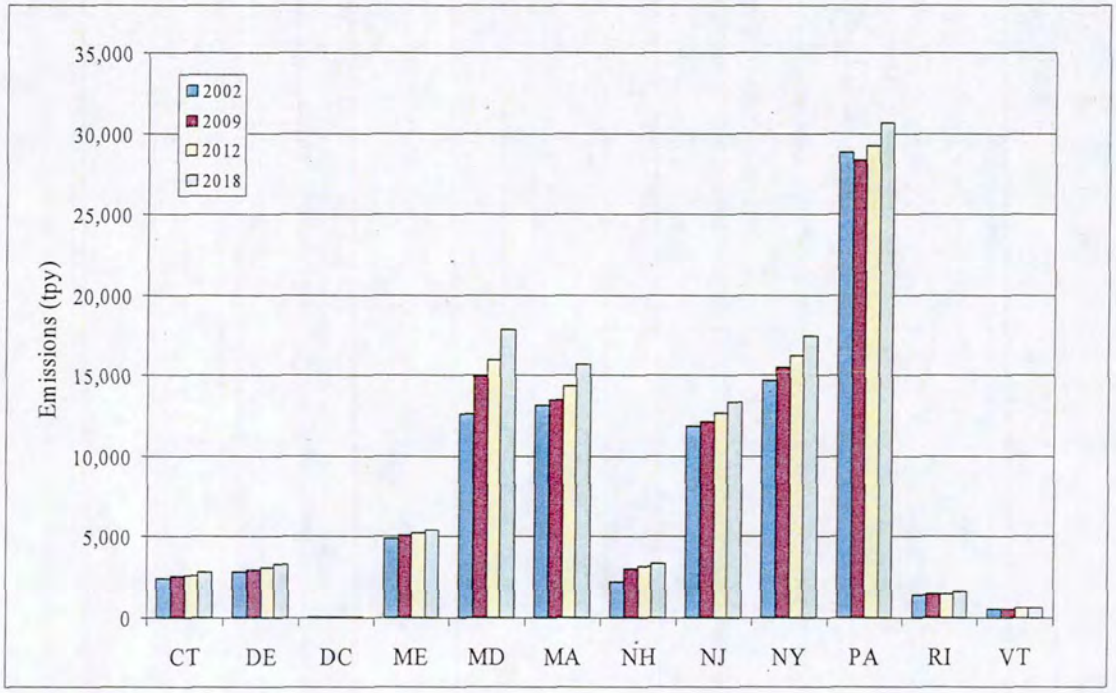


Table 4-3a All Nonroad Sources
OTB/OTW Annual NH3 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	17	18	19	21
DE	5	6	6	7
DC	2	3	3	3
ME	11	13	14	15
MD	28	31	33	36
MA	28	31	33	36
NH	9	10	11	12
NJ	43	45	47	52
NY	79	89	94	103
PA	55	62	66	73
RI	4	4	5	5
VT	5	5	6	6
Total	**287**	**317**	**337**	**369**

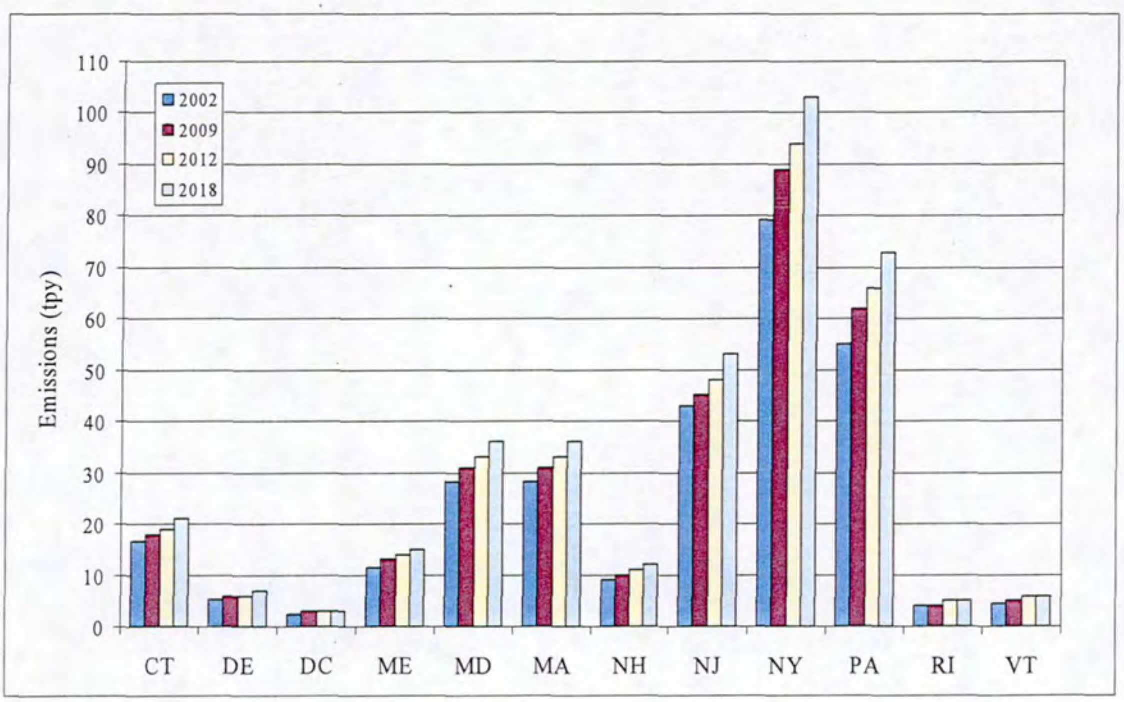


Table 4-3b NONROAD Model Sources
OTB/OTW Annual NH3 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	17	18	19	21
DE	5	6	6	6
DC	2	3	3	3
ME	11	13	14	15
MD	28	31	33	36
MA	28	31	33	36
NH	9	10	11	12
NJ	43	45	47	52
NY	79	89	94	103
PA	55	62	66	73
RI	4	4	5	5
VT	5	5	6	6
Total	**287**	**318**	**335**	**369**

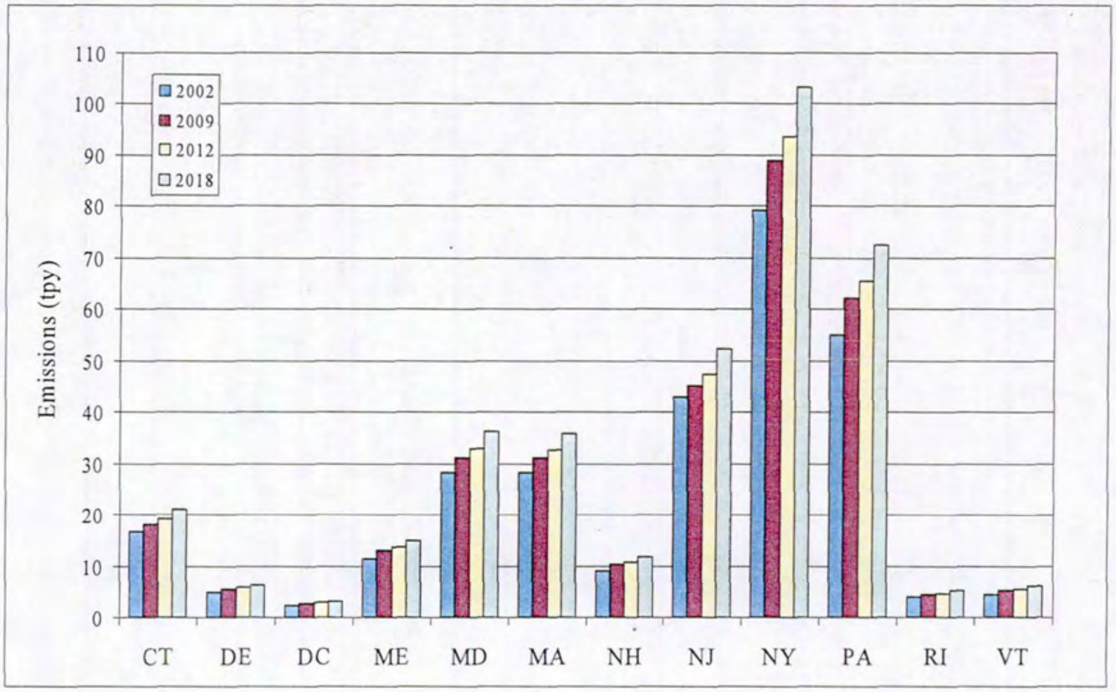


Table 4-3c Aircraft, Locomotive, and Commercial Marine Sources OTB/OTW Annual NH3 Emission Projections (tons per year)

State	2002	2009	2012	2018
CT	0	0	0	0
DE	0	0	0	0
DC	0	0	0	0
ME	0	0	0	0
MD	0	0	0	0
MA	0	0	0	0
NH	0	0	0	0
NJ	0	0	0	0
NY	0	0	0	0
PA	0	0	0	0
RI	0	0	0	0
VT	0	0	0	0
Total	**<1**	**<1**	**<1**	**<1**

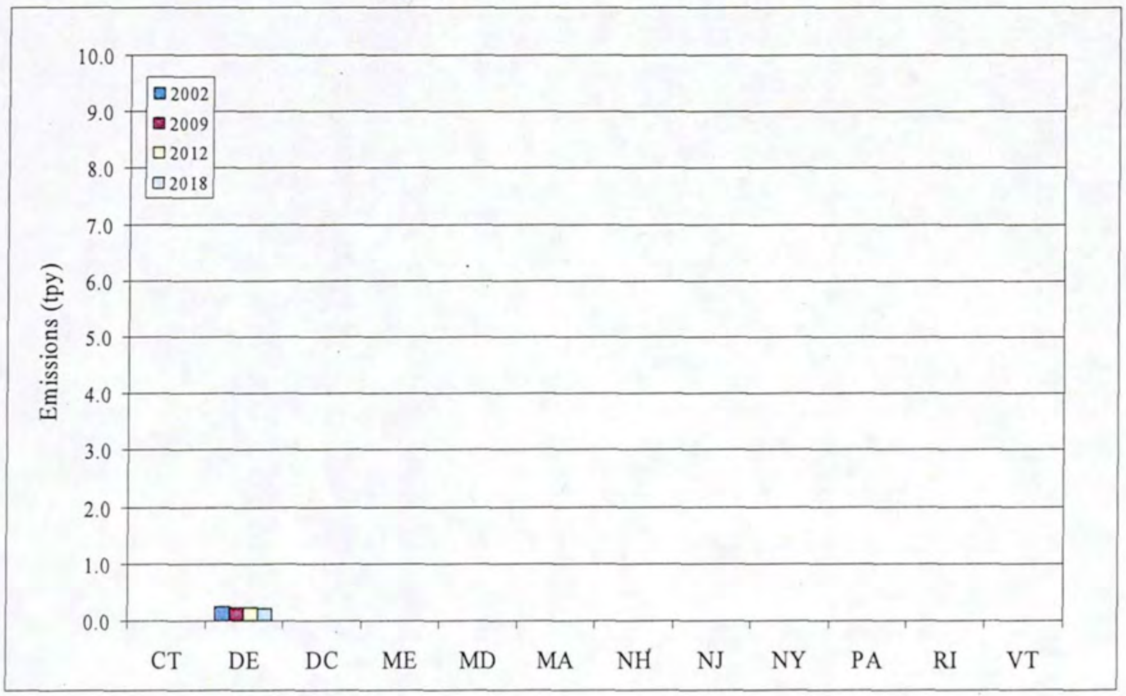


Table 4-4a All Nonroad Sources
OTB/OTW Annual NOx Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	25,460	21,512	19,316	16,233
DE	16,227	15,439	15,081	14,631
DC	3,571	2,981	2,620	1,815
ME	9,820	8,500	7,752	6,543
MD	37,472	31,762	29,058	24,257
MA	42,769	35,703	32,118	27,040
NH	9,912	8,485	7,624	6,344
NJ	63,479	52,703	48,234	41,166
NY	109,878	94,186	85,852	72,400
PA	103,824	76,105	67,818	55,771
RI	5,002	4,022	3,470	2,723
VT	4,217	3,452	2,992	2,262
Total	**431,631**	**354,850**	**321,935**	**271,185**

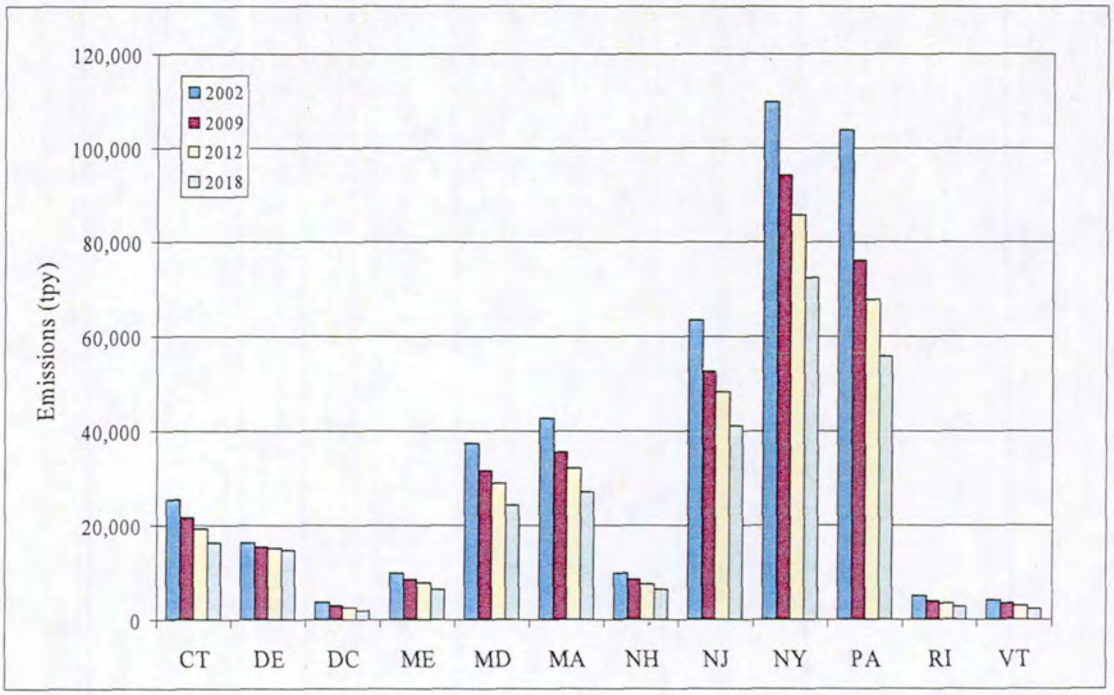


Table 4-4b NONROAD Model Sources
OTB/OTW Annual NOx Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	17,897	14,849	12,811	9,784
DE	5,798	4,755	4,108	2,966
DC	3,066	2,561	2,221	1,444
ME	8,229	6,957	6,211	4,970
MD	27,789	23,431	20,839	15,745
MA	30,047	24,606	21,274	16,096
NH	8,150	6,749	5,893	4,583
NJ	43,515	34,447	30,416	23,594
NY	78,648	66,645	58,900	45,400
PA	62,265	49,982	42,571	30,797
RI	4,564	3,624	3,066	2,294
VT	4,170	3,403	2,941	2,205
Total	**294,138**	**242,009**	**211,252**	**159,877**

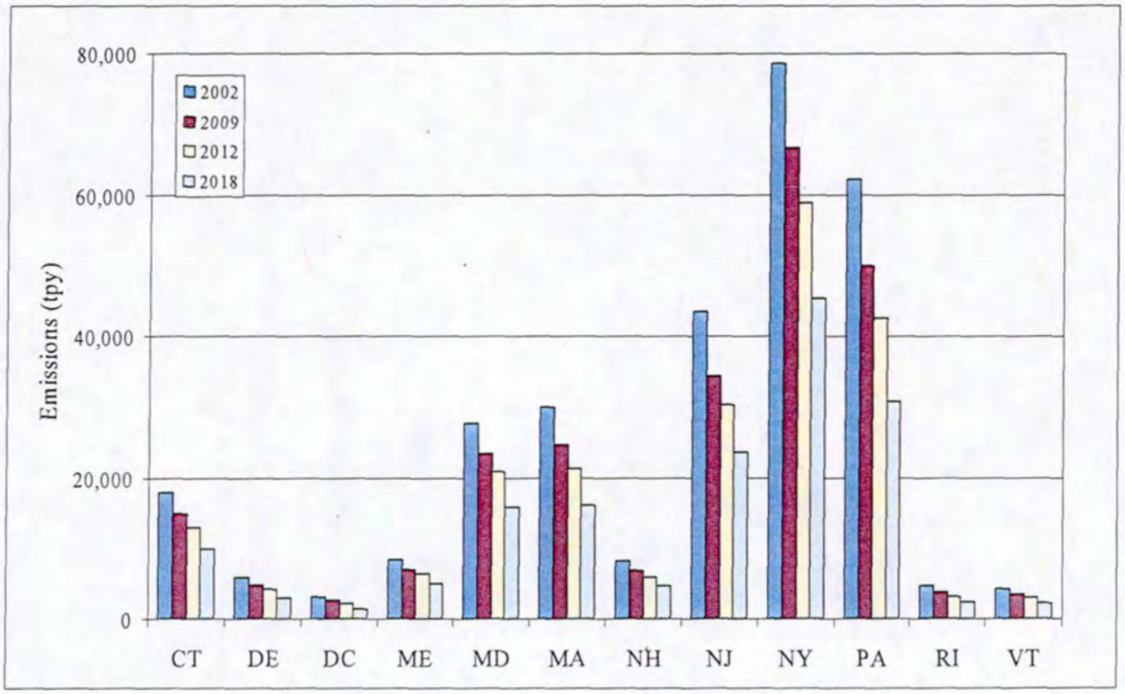


Table 4-4c Aircraft, Locomotive, and Commercial Marine Sources OTB/OTW Annual NOx Emission Projections (tons per year)

State	2002	2009	2012	2018
CT	7,563	6,663	6,505	6,449
DE	10,428	10,684	10,973	11,665
DC	505	420	399	371
ME	1,592	1,543	1,541	1,573
MD	9,683	8,331	8,219	8,512
MA	12,722	11,097	10,844	10,944
NH	1,763	1,736	1,731	1,761
NJ	19,964	18,256	17,818	17,572
NY	31,230	27,541	26,952	27,000
PA	41,559	26,123	25,247	24,974
RI	438	398	404	429
VT	47	49	51	57
Total	**137,493**	**112,841**	**110,683**	**111,308**

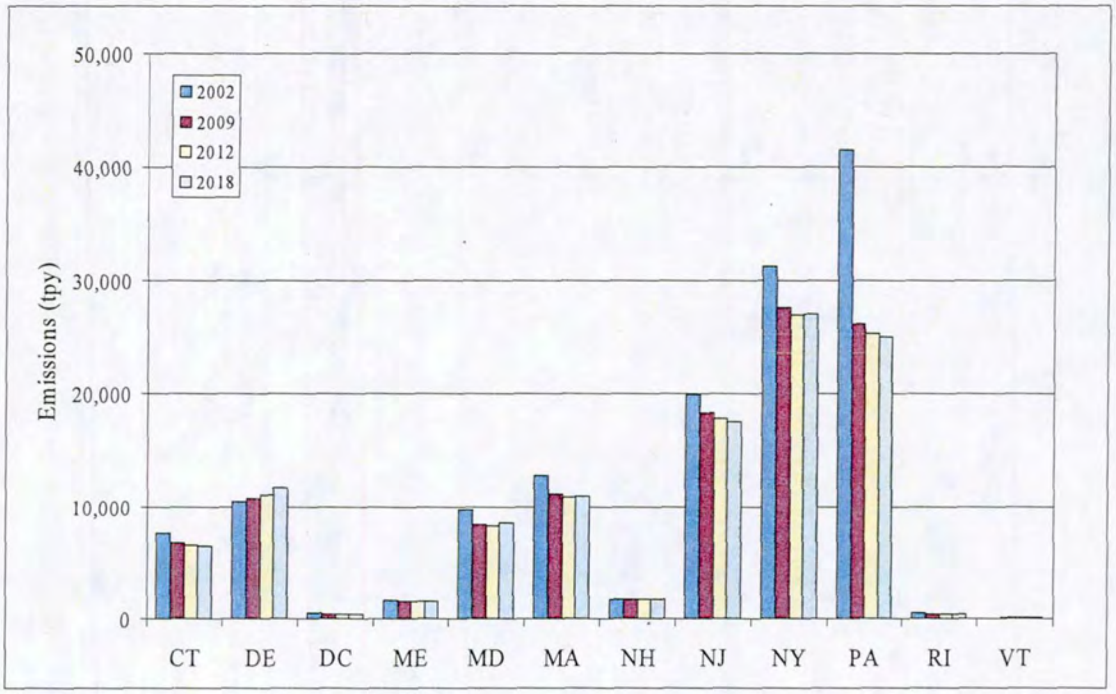


Table 4-5a All Nonroad Sources
OTB/OTW Annual PM10-PRI Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	1,952	1,642	1,532	1,236
DE	1,021	947	940	897
DC	310	235	209	135
ME	1,437	1,367	1,301	1,086
MD	4,936	4,353	4,191	3,814
MA	3,531	2,964	2,768	2,246
NH	1,058	944	881	698
NJ	5,495	4,539	4,233	3,489
NY	9,605	8,050	7,425	5,830
PA	9,738	8,501	8,112	6,949
RI	500	435	414	348
VT	530	476	439	331
Total	**40,114**	**34,453**	**32,445**	**27,059**

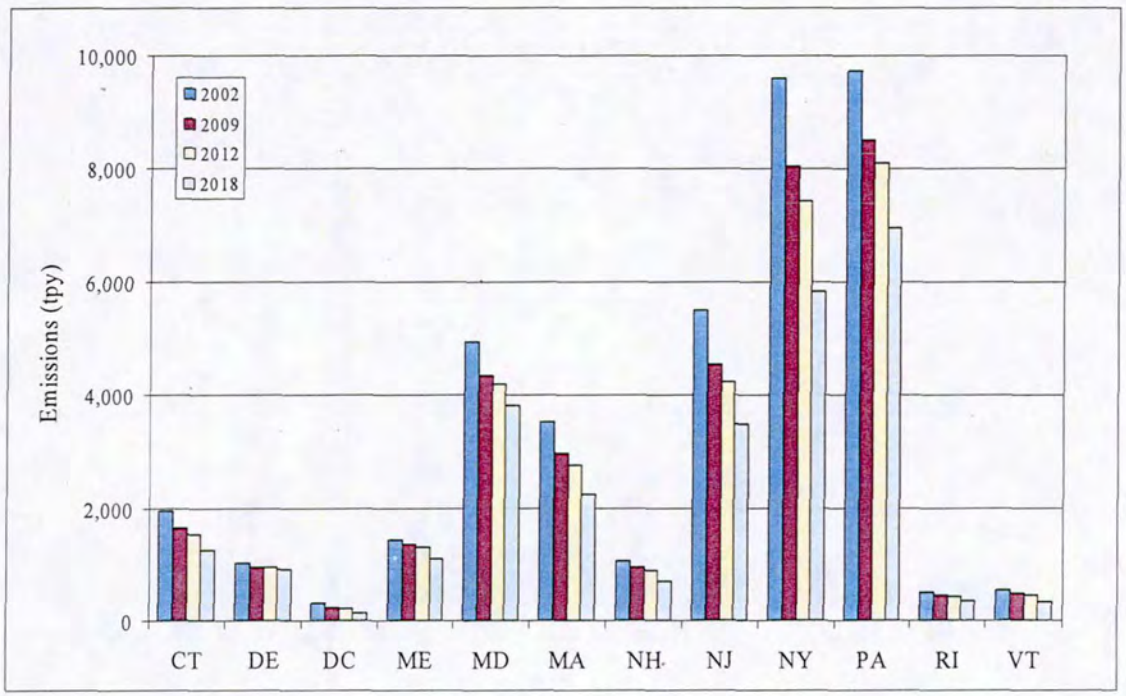


Table 4-5b NONROAD Model Sources
OTB/OTW Annual PM10-PRI Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	1,713	1,407	1,295	987
DE	570	456	414	301
DC	298	226	200	127
ME	1,204	1,119	1,039	797
MD	3,119	2,534	2,321	1,782
MA	2,887	2,370	2,176	1,640
NH	947	834	769	581
NJ	4,285	3,424	3,143	2,411
NY	8,339	6,871	6,248	4,624
PA	6,282	5,282	4,839	3,574
RI	403	337	314	244
VT	518	462	425	316
Total	**30,565**	**25,321**	**23,182**	**17,385**

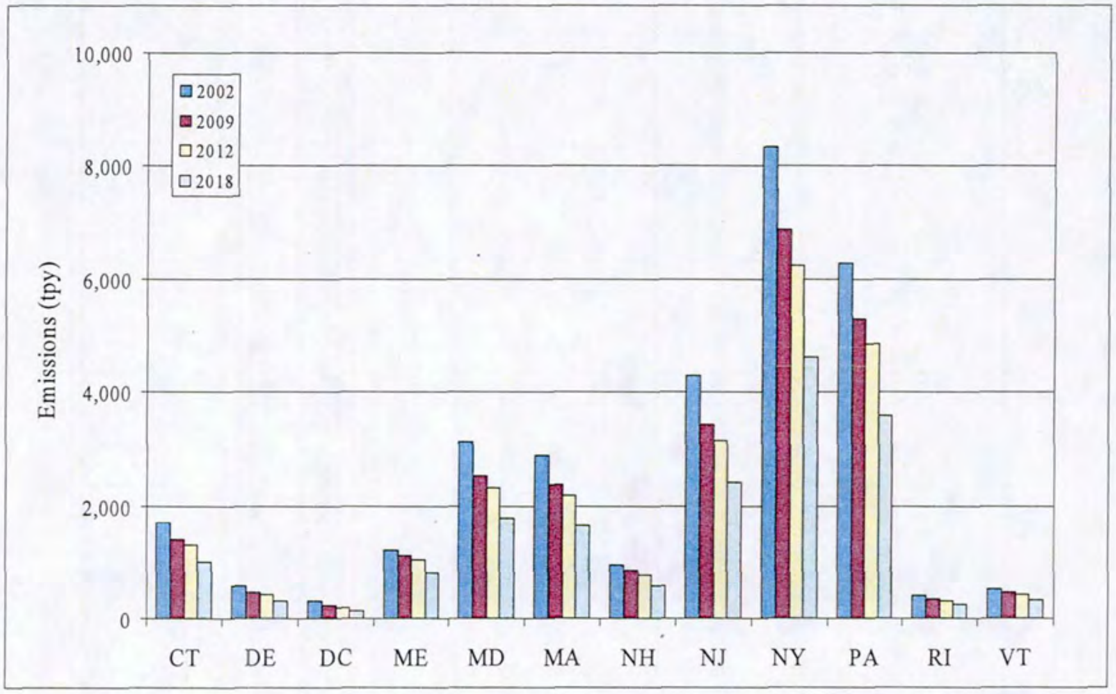


Table 4-5c Aircraft, Locomotive, and Commercial Marine Sources OTB/OTW Annual PM10-PRI Emission Projections (tons per year)

State	2002	2009	2012	2018
CT	239	235	237	249
DE	451	491	526	596
DC	12	9	9	8
ME	233	248	262	289
MD	1,817	1,819	1,870	2,032
MA	644	594	592	606
NH	111	110	112	117
NJ	1,210	1,115	1,090	1,078
NY	1,266	1,179	1,177	1,206
PA	3,456	3,219	3,273	3,375
RI	97	98	100	104
VT	12	14	14	15
Total	**9,549**	**9,132**	**9,263**	**9,674**

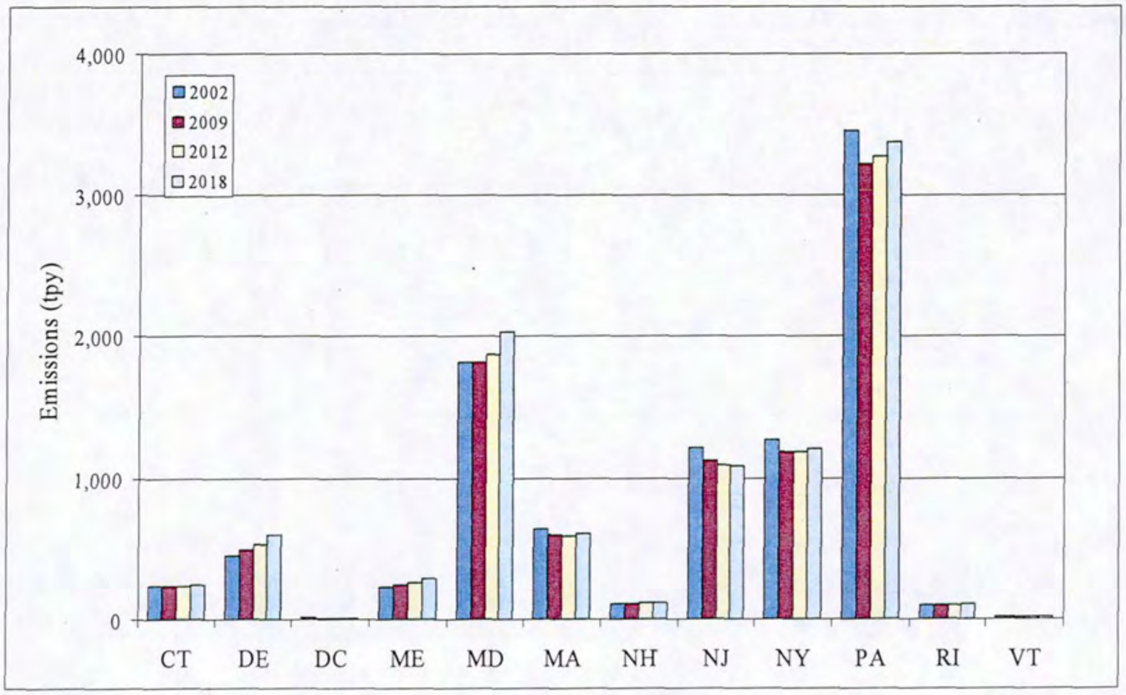


Table 4-6a All Nonroad Sources
OTB/OTW Annual PM25-PRI Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	1,794	1,508	1,408	1,135
DE	926	856	849	808
DC	299	216	192	124
ME	1,329	1,238	1,177	978
MD	4,357	3,806	3,653	3,301
MA	3,226	2,710	2,531	2,052
NH	965	861	802	634
NJ	4,997	4,113	3,829	3,143
NY	8,821	7,390	6,815	5,349
PA	8,440	7,274	6,900	5,808
RI	443	383	364	303
VT	486	436	402	303
Total	**36,084**	**30,791**	**28,922**	**23,938**

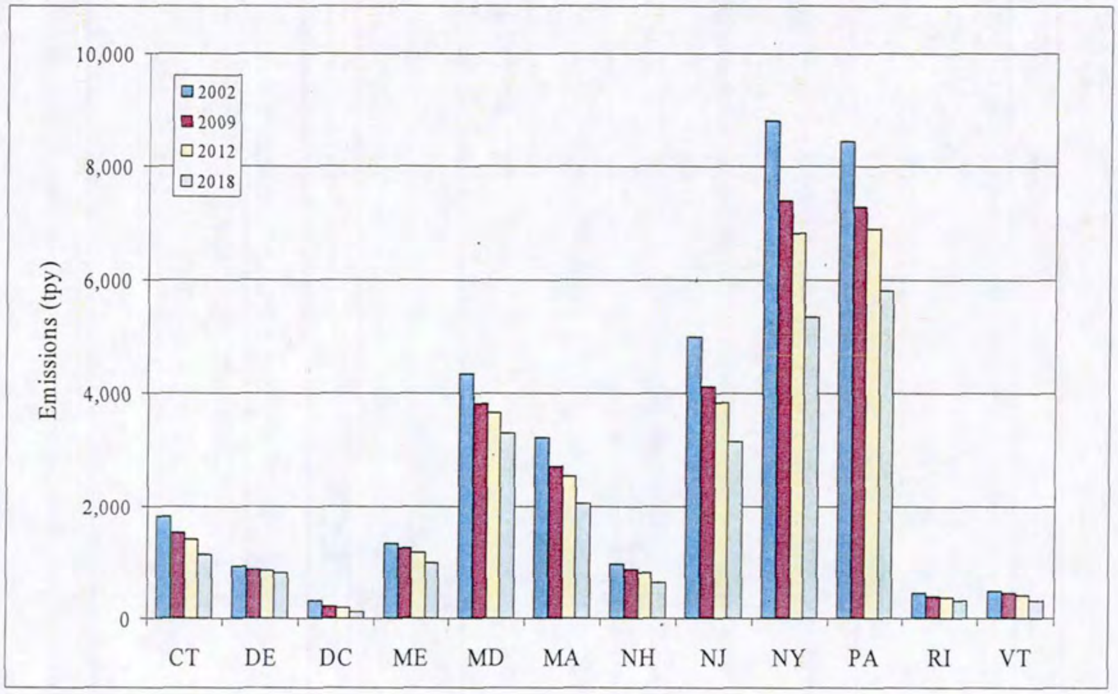


Table 4-6b NONROAD Model Sources
OTB/OTW Annual PM25-PRI Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	1,578	1,296	1,193	911
DE	525	420	381	277
DC	288	208	184	117
ME	1,135	1,030	956	734
MD	2,870	2,333	2,137	1,641
MA	2,659	2,184	2,005	1,512
NH	872	768	708	536
NJ	3,951	3,154	2,896	2,223
NY	7,677	6,327	5,755	4,262
PA	5,784	4,866	4,459	3,296
RI	371	311	290	226
VT	477	426	391	292
Total	**28,186**	**23,321**	**21,356**	**16,027**

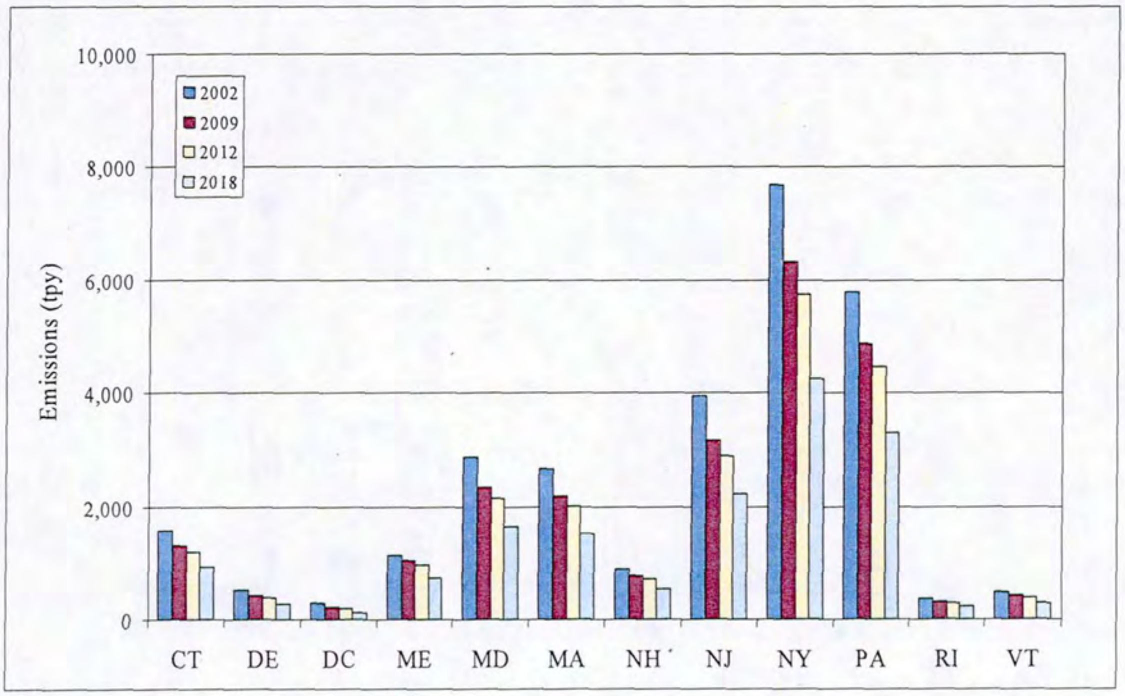


Table 4-6c Aircraft, Locomotive, and Commercial Marine Sources OTB/OTW Annual PM25-PRI Emission Projections (tons per year)

State	2002	2009	2012	2018
CT	216	212	215	224
DE	401	436	468	531
DC	11	8	8	7
ME	194	208	221	244
MD	1,487	1,473	1,516	1,660
MA	568	526	526	540
NH	94	93	94	98
NJ	1,047	959	933	920
NY	1,144	1,063	1,060	1,087
PA	2,656	2,408	2,441	2,512
RI	72	72	74	77
VT	9	10	11	11
Total	**7,898**	**7,470**	**7,566**	**7,911**

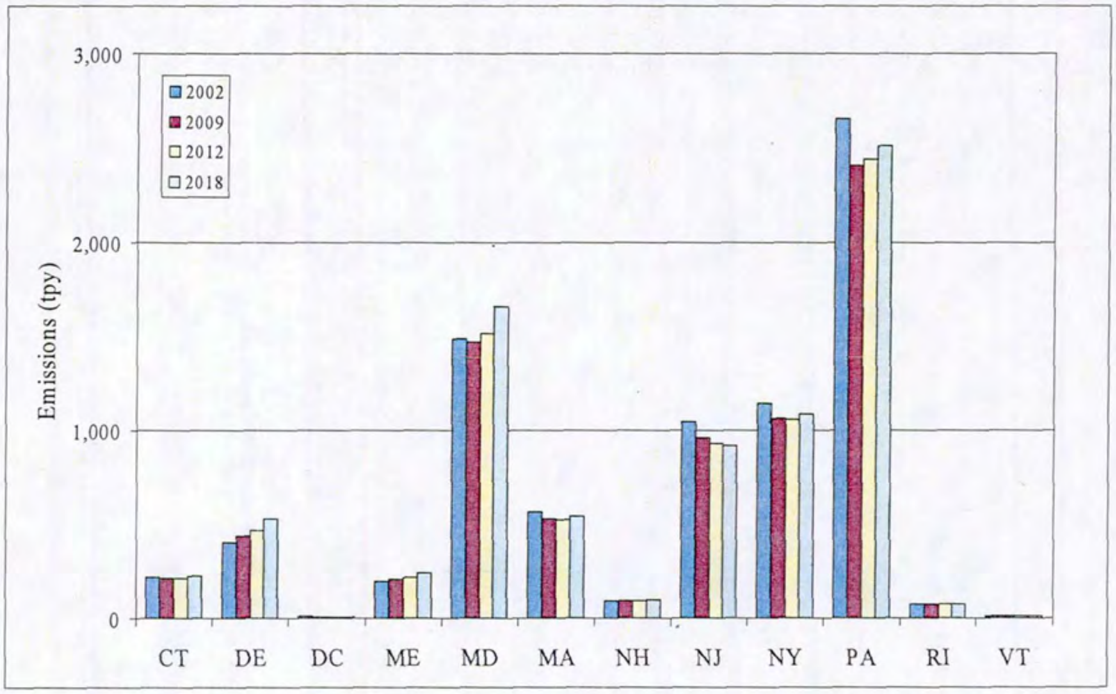


Table 4-7a All Nonroad Sources
OTB/OTW Annual SO2 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	2,087	887	711	815
DE	3,983	2,851	2,834	3,296
DC	375	66	9	5
ME	917	201	82	82
MD	7,942	1,638	706	577
MA	3,791	983	470	442
NH	891	310	218	246
NJ	15,686	3,508	1,253	832
NY	12,920	3,387	1,724	1,686
PA	7,915	1,659	667	607
RI	377	93	42	42
VT	372	68	15	13
Total	**57,257**	**15,651**	**8,731**	**8,643**

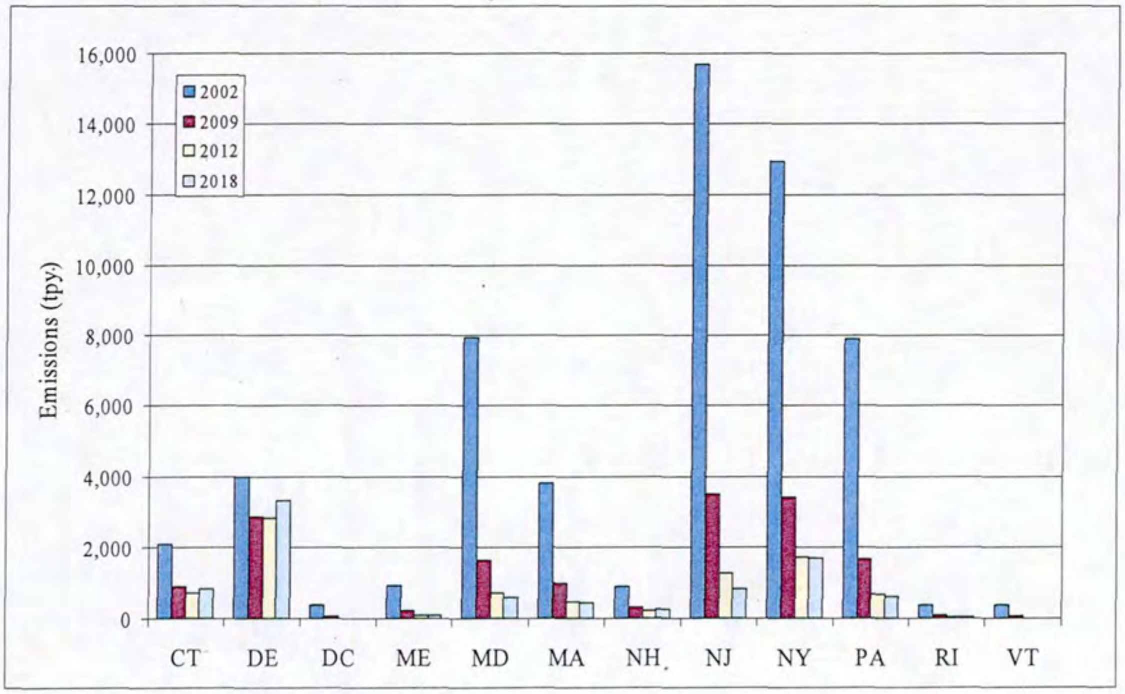


Table 4-7b NONROAD Model Sources
OTB/OTW Annual SO2 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	1,377	249	39	28
DE	513	90	12	8
DC	341	59	6	3
ME	772	132	24	19
MD	2,569	452	63	42
MA	2,428	429	66	47
NH	673	119	20	16
NJ	3,525	607	93	67
NY	6,966	1,208	182	130
PA	5,292	917	135	92
RI	336	60	10	7
VT	368	64	10	8
Total	**25,159**	**4,387**	**661**	**467**

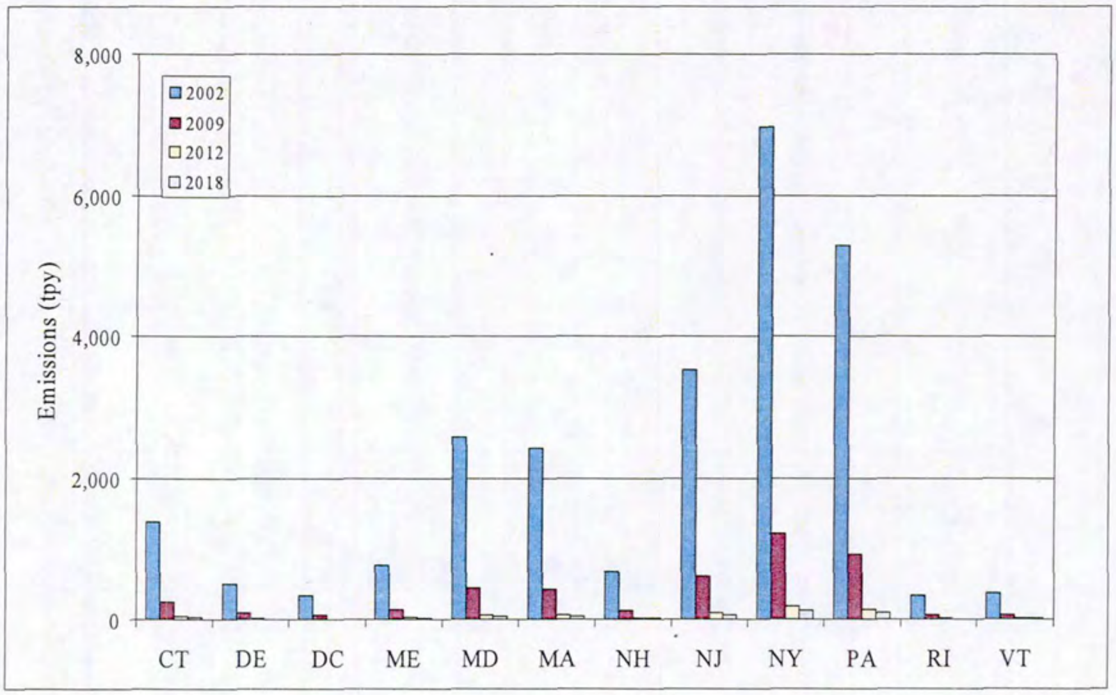


Table 4-7c Aircraft, Locomotive, and Commercial Marine Sources
OTB/OTW Annual SO2 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	711	638	672	787
DE	3,470	2,761	2,822	3,288
DC	34	7	3	2
ME	145	69	58	63
MD	5,372	1,186	643	535
MA	1,363	554	404	395
NH	218	191	198	230
NJ	12,161	2,901	1,160	765
NY	5,953	2,179	1,542	1,556
PA	2,623	742	532	515
RI	42	33	32	35
VT	5	4	5	5
Total	**32,097**	**11,264**	**8,070**	**8,176**

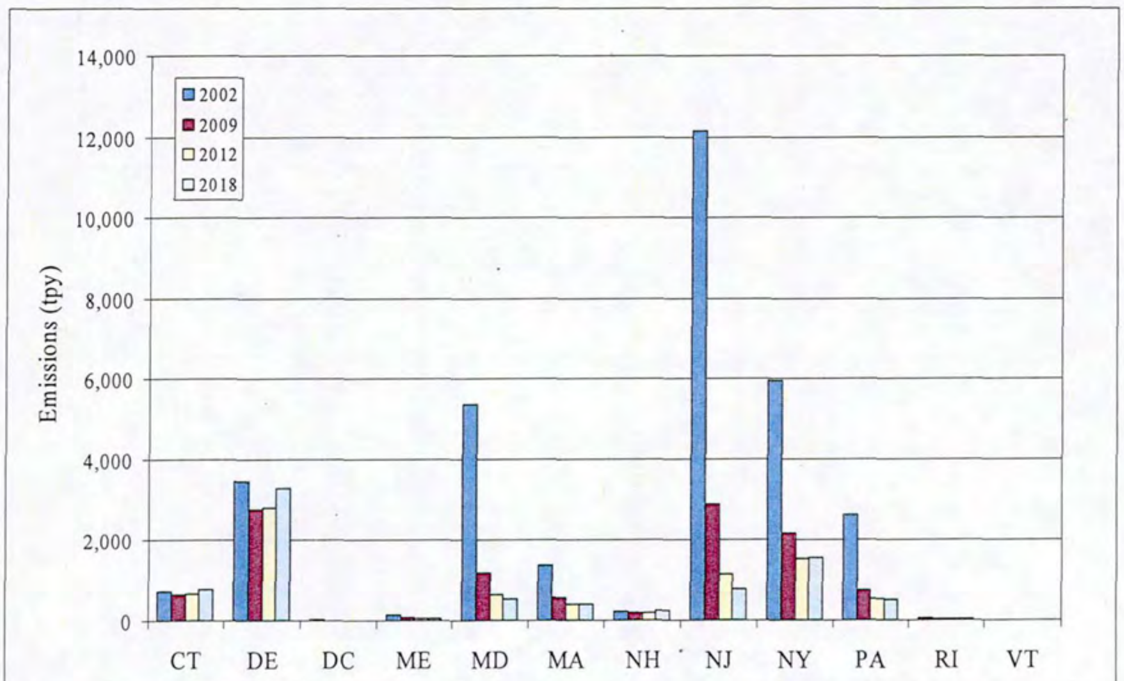


Table 4-8a All Nonroad Sources
OTB/OTW Annual VOC Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	33,880	24,910	22,657	20,694
DE	8,010	6,440	6,044	5,653
DC	2,073	1,559	1,438	1,369
ME	31,144	29,445	27,093	21,988
MD	56,330	43,260	40,266	37,969
MA	56,749	43,429	39,713	36,306
NH	22,377	19,651	17,933	15,003
NJ	83,919	62,920	57,769	53,625
NY	157,612	128,421	117,770	104,562
PA	102,331	84,744	78,630	69,956
RI	7,780	6,038	5,640	5,389
VT	10,548	10,105	9,304	7,566
Total	**572,751**	**460,922**	**424,257**	**380,080**

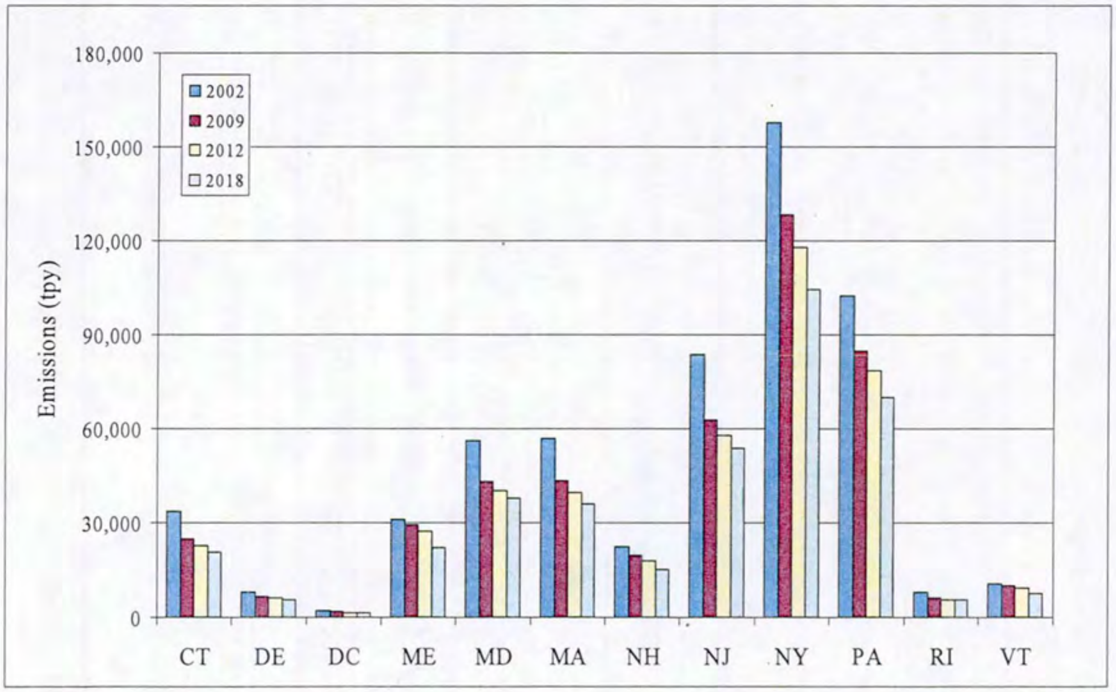


Table 4-8b NONROAD Model Sources
OTB/OTW Annual VOC Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	33,519	24,546	22,286	20,308
DE	7,531	5,943	5,533	5,115
DC	2,053	1,540	1,419	1,351
ME	30,741	29,030	26,669	21,547
MD	53,035	39,731	36,638	34,106
MA	54,836	41,473	37,706	34,185
NH	22,238	19,476	17,752	14,810
NJ	81,900	60,878	55,682	51,451
NY	155,475	126,265	115,553	102,224
PA	99,241	82,094	75,941	67,186
RI	7,699	5,956	5,556	5,302
VT	10,520	10,076	9,273	7,533
Total	**558,788**	**447,006**	**410,009**	**365,117**

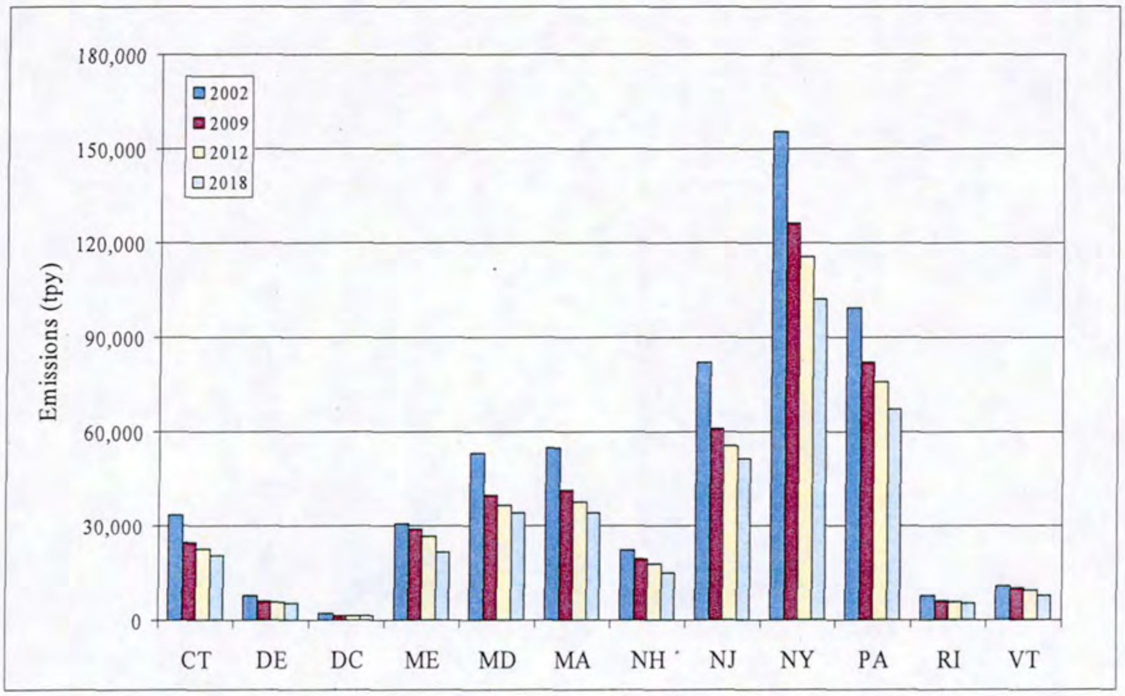
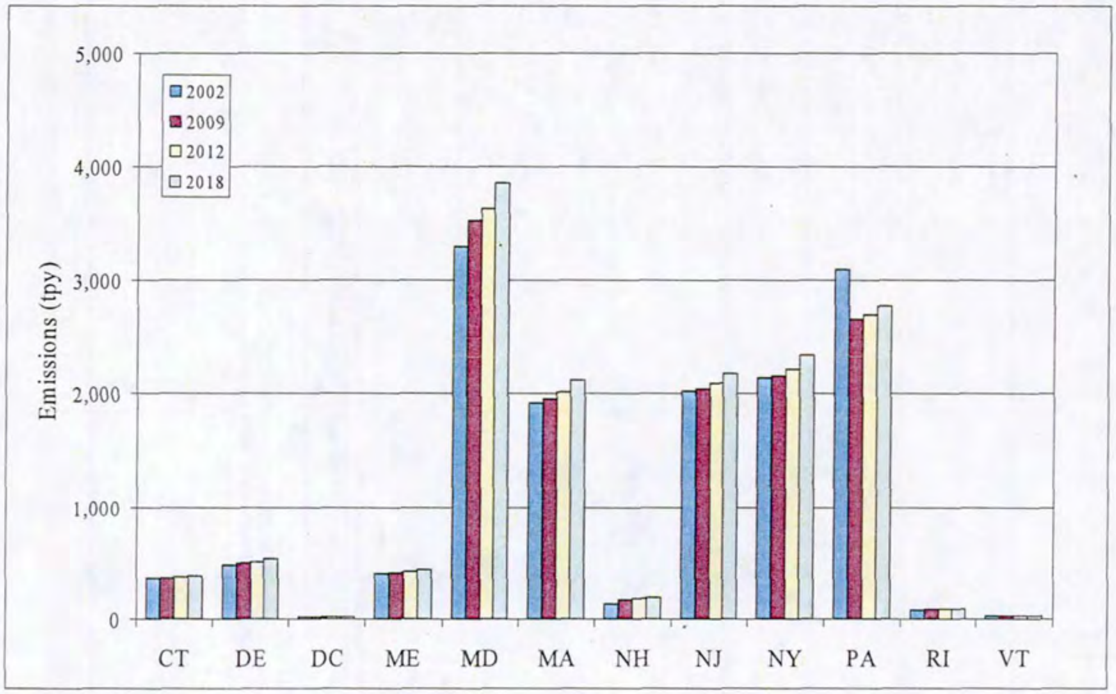


Table 4-8c Aircraft, Locomotive, and Commercial Marine Sources
OTB/OTW Annual VOC Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	361	364	371	386
DE	480	497	511	538
DC	20	19	19	18
ME	403	415	424	441
MD	3,295	3,529	3,628	3,863
MA	1,913	1,956	2,007	2,121
NH	139	175	181	193
NJ	2,019	2,042	2,087	2,174
NY	2,137	2,156	2,217	2,338
PA	3,090	2,650	2,689	2,770
RI	81	82	84	87
VT	27	29	31	33
Total	**13,964**	**13,916**	**14,248**	**14,963**



5.0 BEYOND-ON-THE-WAY EMISSION INVENTORY

The States are considering additional control measures as part of their planning to achieve regional haze goals and to attain the ozone and PM2.5 National Ambient Air Quality Standards (NAAQS). To accomplish this, many of the states will need to implement additional measures to reduce emissions. As such, the Ozone Transport Commission (OTC) undertook an exercise to identify a suite of additional control measures that could be used by the states in the Ozone Transport Region (OTR) in attaining their air quality goals.

Based on the analyses conducted by various OTC Workgroups, the OTC Commissioners made several recommendations at the Commissioner's meeting in Boston on June 7, 2006:

- *Memorandum of Understanding Among the States of the Ozone Transport Commission on a Regional Strategy Concerning the Integrated Control of Ozone Precursors from Various Sources*
- *Resolution 06-02 of the Ozone Transport Commission Concerning Coordination and Implementation of Regional Ozone Control Strategies for Certain Source Categories*
- *Statement of the Ozone Transport Commission Concerning Multi-Pollutant Emission Control of Electric Generating Units*
- *Resolution 06-03 of the Ozone Transport Commission Concerning Federal Guidance and Rulemaking for Nationally-Relevant Ozone Control Measures*

The Commissioners recommended that States consider emission reductions from the following source categories:

- Consumer Products
- Portable Fuel Containers
- Adhesives and Sealants Application
- Diesel Engine Chip Reflash
- Cutback and Emulsified Asphalt Paving
- Asphalt Production Plants
- Cement Kilns
- Glass Furnaces
- Industrial, Commercial, and Institutional (ICI) Boilers
- Regional Fuels
- Electric Generating Units (EGUs)

This suite of controls for the above source categories constitutes a "beyond-on-the-way" (BOTW) scenario to be used in modeling ozone, fine particles, and regional haze in the OTR and MANE-VU regions.

For the MANE-VU modeling inventory, each state was asked to complete a matrix to identify which of the above source category control measures to include and in which years the control measure should be applied. This section documents the emission reductions anticipated to result from the implementation of the above control measures based on the state recommendations for measures to include for each state, source category, and projection year. There are five subsections discussing the control measure and emission reductions for the five source category sectors: nonEGU point sources, area sources, EGUs, onroad mobile sources, and nonroad mobile sources.

5.1 NONEGU POINT SOURCES

This Section describes the analysis of the control measures to reduce emissions from non-EGU point sources. The control measures included in this analysis reduce emissions for the following pollutants and nonEGU point source categories:

- NOx measures: asphalt production plants; cement kilns; glass and fiberglass furnaces; low sulfur heating oil for commercial and institutional units; and ICI boilers (natural gas, #2 fuel oil, #4/#6 fuel oil, and coal);
- Primary PM10 and PM2.5 measure: commercial heating oil;
- SO2 measures: commercial heating oil and ICI boilers (#2 fuel oil, #4/#6 fuel oil, and coal); and
- VOC measure: adhesives and sealants application;

For the MANE-VU modeling inventory, each state was asked to complete a matrix to identify which nonEGU control measures to include and in which years the control measure should be applied. Table 5.1 summarizes the staff recommendations for NOx control measures to include in the BOTW regional modeling inventory for non-EGU source categories (except ICI boilers). Table 5.2 summarizes the staff recommendations for NOx emission reductions for ICI boilers. Tables 5.3 and 5.4 summarize the staff recommendations for control measures to include in the BOTW regional modeling inventory for SO2 and VOC emissions, respectively. The following subsections describe the emission reductions anticipated for each of the control measures.

Table 5.1 State Staff Recommendations for Control Measures to Include in BOTW Regional Modeling – NOx Emissions from NonEGU Point Sources

	Asphalt Production Plants			Cement Kilns			Glass and Fiberglass Furnaces			Commercial & Institutional Heating Oil		
State	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
CT	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A	No	No	Yes
DE	No	No	No	N/A	N/A	N/A	N/A	N/A	N/A	No	No	No
DC	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A	No	Yes	Yes
ME	No	No	No	Yes	Yes	Yes	N/A	N/A	N/A	No	Yes	Yes
MD	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
MA	No	No	No	N/A	N/A	N/A	Yes	Yes	Yes	No	Yes	Yes
NH	No	No	No	N/A	N/A	N/A	N/A	N/A	N/A	No	No	Yes
NJ	No	Yes	Yes	N/A	N/A	N/A	No	Yes[2]	Yes[2]	No	Yes	Yes
NY	Yes	Yes	Yes	Yes[1]	Yes[1]	Yes[1]	Yes[2]	Yes[3]	Yes[3]	No	Yes	Yes
PA	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
RI	No	No	No	N/A	N/A	N/A	No	No	No	No	Yes	Yes
VT	No	No	No	N/A	N/A	N/A	N/A	N/A	N/A	No	No	No

Yes - Include emission reductions from control measure in modeling inventory
No - Do not include emission reduction from control measure in modeling inventory
N/A – No facilities of this type located in the state

1) New York specified that a 40 percent NOx reduction from cement kilns should be used.
2) New Jersey specified a 20 percent NOx reduction from glass furnaces in 2012 and a 35 percent reduction in 2018.
3) New York specified a 70 percent NOx reduction from glass furnaces beginning in 2009.

Table 5.2 State Staff Recommendations for Control Measures to Include in BOTW Regional Modeling – NOx Emissions from ICI Boilers

	ICI Boilers < 25 mmBTU/hour			ICI Boilers 25-50 mmBtu/hour			ICI Boilers 50-100 mmBtu/hour			ICI Boilers 100-250 mmBtu/hour			ICI Boilers >250 mmBtu/hour (see note 7)		
State	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
CT	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	No	No	No
DE	No	No	No	No	No	No	No	No	No	Yes[4]	Yes[4]	Yes[4]	No	No	No
DC	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
ME	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
MD	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	No	No	No
MA	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
NH	No	No	No	Yes[5]	Yes[5]	Yes[5]	Yes	Yes	Yes	Yes[5]	Yes[5]	Yes[5]	No	No	No
NJ	Yes[2]	Yes[2]	Yes[2]	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No
NY	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
PA	No[3]	No[3]	No[3]	No[3]	No[3]	No[3]	No[3]	No[3]	No[3]	No[6]	No[6]	No[6]	No	No	No
RI	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
VT	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Yes - Include emission reductions from control measure in modeling inventory
No - Do not include emission reduction from control measure in modeling inventory
N/A – No facilities of this type located in the state
1) Connecticut is now pursuing adoption of model rule for boilers of all sizes at major and non-major sources
2) New Jersey specified a 5 percent reduction in 2009, 10 percent in 2012, and 10 percent in 2018
3) Pennsylvania specified no reductions since sources already covered by statewide NOx RACT regulation
4) Delaware is developing regulation for ICI boilers greater than 200 mmBtu/hour – no plans for regulating smaller units
5) New Hampshire specified a 40 percent reduction for 25-50 mmBtu/hour boilers, and a 10 percent reduction for natural gas-fired 100-250 mmBtu/hour boilers
6) Pennsylvania specified no reductions since sources in the 5-county Philadelphia area are already covered by the Small Sources of NOx regulation and do not plan on expanding the regulation outside of the corridor at this time
7) Resolution 06-02 specified the reduction for > 250mmBtu/hour boilers to be the "same as EGUs of similar size." The OTC Commissioners have not yet recommended an emission rate or percent reduction for EGUs. As a result, no reductions for ICI boilers > 250 mmBtu/hour were included in the BOTW inventory.

Table 5.3 State Staff Recommendations for Control Measures to Include in BOTW Regional Modeling – SO2 Emissions from NonEGU Point Sources

	Commercial & Institutional Heating Oil			ICI Boilers (low sulfur fuel)		
State	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
CT	No	No	Yes	No	No	No
DE	No	No	No	No	No	No
DC	No	Yes	Yes	No	No	No
ME	No	Yes	Yes	No	No	No
MD	No	Yes	Yes	No	No	No
MA	No	Yes	Yes	No	No	No
NH	No	No	Yes	No	No	No
NJ	No	Yes	Yes	No	No	No
NY	No	Yes	Yes	No	No	No
PA	No	Yes	Yes	No	No	No
RI	No	Yes	Yes	No	No	No
VT	No	No	No	No	No	No

Yes - Include emission reductions from control measure in modeling inventory
No - Do not include emission reduction from control measure in modeling inventory

Table 5.4 State Staff Recommendations for Control Measures to Include in BOTW Regional Modeling – VOC Emissions from NonEGU Point Sources

	Adhesives and Sealants Application		
State	**2009**	**2012**	**2018**
CT	Yes	Yes	Yes
DE	Yes	Yes	Yes
DC	Yes	Yes	Yes
ME	Yes	Yes	Yes
MD	Yes	Yes	Yes
MA	Yes	Yes	Yes
NH	No	Yes	Yes
NJ	No[1]	No[1]	No[1]
NY	Yes	Yes	Yes
PA	Yes	Yes	Yes
RI	Yes	Yes	Yes
VT	No	No	No

Yes - Include emission reductions from control measure in modeling inventory
No - Do not include emission reduction from control measure in modeling inventory

1) New Jersey indicated that the reductions from the adhesives and sealants application control measure should only apply to area source - no reductions for point sources (SCC 4-02-007-xx) were included due to inventory double-counting issues, not due to rule change issues.

5.1.1 Adhesives and Sealants Application

The OTC 2006 model rule for adhesives and sealants is based on the reasonably available control technology (RACT) and best available retrofit control technology (BARCT) determination by the California Air Resources Board (CARB) developed in 1998. Adhesive and sealant emission sources are classified as both point sources and area sources. About 96 percent of adhesive and sealant VOC emissions in the OTC states fall into the area source category. The remaining four percent of the VOC emissions are included in the point source inventory.

The emission reduction benefit estimation methodology is based on information developed and used by CARB for their RACT/BARCT determination in 1998. For point sources, we first identified those sources that were applying adhesives and sealants (using the source classification code of 4-02-007-xx, adhesives application). Next, we reviewed the MANEVU inventory to determine whether these sources had existing capture and control systems. Most of the sources did not have control information in the NIF database. However, several sources reported capture and destruction efficiencies in the 70 to 99 percent range, with a few sources reporting capture and destruction efficiencies of 99+ percent. Sources with existing control systems that exceeded an 85 percent overall capture and destruction efficiency would comply with the OTC 2006 model rule provision for add-on air pollution control equipment; therefore, no additional reductions were calculated for these sources. For point sources without add-on control equipment, we used the 64.4 percent reduction based on the CARB determination.

5.1.2 Asphalt Production Plants

In Resolution 06-02, the OTC Commissioners recommended that OTC member states pursue as necessary and appropriate state-specific rulemakings or other implementation methods to establish emission reduction percentages, emission rates or technologies that would result in about a 35 percent reduction in NOx emissions. The reductions estimated for this category only include emissions included in the MANE-VU point source emission inventory. Only emissions from major point sources are typically included in the MANE-VU point source database. Emissions from non-major sources are not explicitly contained in the area source inventory; rather, the emissions from non-major asphalt plants are likely lumped together in the general area source industrial and commercial fuel use category. Therefore, there is some uncertainty regarding the actual reductions that will occur as since minor sources are not specifically identified in the MANE-VU inventory.

5.1.3 Cement Kilns

In Resolution 06-02, the OTC Commissioners recommended that OTC member states pursue as necessary and appropriate state-specific rulemakings or other implementation methods to establish emission reduction percentages, emission rates or technologies that would result in about a 60 percent reduction in NOx emissions from uncontrolled levels. Cement kilns were already included in Phase I of the NO_x SIP call. Emission reductions resulting from the NOx SIP call were accounted for in the 2009 OTB inventory. For the cement kilns in Maryland and New York, a default control efficiency value of 25 percent was applied to account for the reductions expected from the NOx SIP call. For the cement kilns in Pennsylvania, the state provided their best estimates of the actual control efficiency expected for each kiln after the NOx SIP Call. There is a cement kiln in Maine, but it is not subject to the NOx SIP call. To calculate the additional reductions from the OTC 2006 Control Measure, MACTEC back calculated uncontrolled emissions from the 2009 base year inventory based on the controls applied to account for the NOx SIP Call. Once the uncontrolled emissions were calculated, MACTEC applied the 60 percent emission reduction guideline recommended by the OTC Commissioners, except for the kilns in New York. Staff from New York indicated that a 40 percent emission reduction should be used for modeling purposes.

5.1.4 Glass and Fiberglass Furnaces

In Resolution 06-02, the OTC Commissioners recommended that OTC member states pursue as necessary and appropriate state-specific rulemakings or other implementation methods to establish emission reduction percentages, emission rates or technologies that would result in about an 85 percent reduction in NOx emissions from uncontrolled levels. The NOx emission reduction benefit was calculated by applying an 85 percent reduction to the projected 2009 base inventory, except in New Jersey and New York. New Jersey specified a 20 percent NOx reduction from glass furnaces in 2012 and a 35 percent reduction in 2018. New York specified a 70 percent NOx reduction from glass furnaces beginning in 2009. The estimated 85% reductions does not take into account existing controls at the facilities. The OTC states are currently working with the glass industry to obtain additional data to better identify the controls already in place. This will allow for a better calculation of the emission reduction benefits.

5.1.5 Industrial, Commercial, and Institutional Boilers

In Resolution 06-02, the OTC Commissioners recommended that OTC member states pursue as necessary and appropriate state-specific rulemakings or other implementation methods to establish emission reduction percentages, emission rates or technologies for ICI boilers based on guidelines that varied by boiler size and fuel type. Specifically, the following guidelines were provided:

	NOx Reduction from 2009 Base Emissions by Fuel Type			
Boiler Size (mmBtu/hour)	**Natural Gas**	**#2 Fuel Oil**	**#4/#6 Fuel Oil**	**Coal**
<25	10	10	10	10
25 to 50	50	50	50	50*
50 to 100	10	10	10	10*
100 to 250	75	40	40	40*
>250	**	**	**	**

* Resolution 06-02 did not specify a percent reduction for coal; for modeling purposes, the same percent reduction specified for #4/#6 fuel oil was used for coal

** Resolution 06-02 specified the reduction for > 250mmBtu/hour boilers to be the "same as EGUs of similar size." The OTC Commissioners have not yet recommended an emission rate or percent reduction for EGUs. As a result, no reductions for ICI boilers > 250 mmBtu/hour were included in the BOTW inventory.

Since the above guidelines vary by boiler size and fuel type, the specific percent reduction applied to an individual source depends on the SCC and design capacity of the source. The SCC identifies the fuel type, while the design capacity identifies the boiler size. In many cases, the design capacities in the MANE-VU NIF database were missing. MACTEC used the following hierarchy in filling in gaps where design capacities were missing.

- Use the design capacity field from the NIF EU table, if available;
- Use the design capacities provided by State/local agencies to fill in the data gaps (Allegheny County, District of Columbia, Maryland, New Jersey, Philadephia County);
- Use design capacity as reported either the Unit Description field in the NIF EU table or the Process Description field from the NIF EP table, if available;
- Use design capacity from the source's Title V permit, if the Title V permit was on-line;
- Use the SCC description to determine the design capacity (for example, SCC 1-02-006-01 describes a >100 mmBtu/hr natural gas-fired boiler, SCC 1-02-006-02 describes a 10-100 mmBtu/hr natural gas-fired boiler)

After performing this gap-filling exercise, MACTEC was able to assign over 97 percent of the NOx emissions to a specific boiler size range. For the remaining sources where MACTEC could not determine the boiler size (which accounted for only 3 percent of the NOx emissions), MACTEC assumed that these boilers were < 25 mmBtu/hr.

5.1.6 Commercial and Institutional Heating Oil

The BOTW control measure for heating oil is based on NESCAUM's report entitled "Low Sulfur Heating Oil in the Northeast States: An Overview of Benefits, Costs and Implementation Issues." NESCAUM estimates that reducing the sulfur content of heating oil from 2,500 ppm to 500 ppm lowers SO2 emissions by 75 percent, PM emissions by 80 percent, NOx emissions by 10 percent. The 500 ppm sulfur heating oil is not expected to available on a widespread basis until 2012 at the earliest. These percent reductions were applied to commercial distillate oil category (SCC 1-03-005-xx and 1-05-002-05). These percent reductions were applied based on the state's recommendations in the matrix which identifies control measures to include and in which years the control measure should be accounted for in the modeling inventory.

5.1.7 BOTW NonEGU Point Source NIF, SMOKE, and Summary Files

The Version 3.1 file names and descriptions delivered to MARAMA are shown in Table 5-5.

Table E-1 shows the anticipated percent reductions by SCC and year for the nonEGU point source BOTW control measures.

5.1.8 BOTW NonEGU Point Source Emission Summaries

Emission summaries by state, year, and pollutant are presented in Tables 5-6 through 5-12 for CO, NH3, NOx, PM10-PRI, PM25-PRI, SO2, and VOC, respectively.

Table 5-5 BOTW NonEGU Point Source NIF, IDA, and Summary File Names

File Name	Date	Description
MANEVU_BOTW2009_NonEGU_NIFV3_1.mdb	Dec. 4, 2006	Version 3.1 of 2009 BOTW nonEGU source NIF inventory
MANEVU_BOTW2012_NonEGU_NIFV3_1.mdb	Dec. 4, 2006	Version 3.1 of 2012 BOTW nonEGU source NIF inventory
MANEVU_BOTW2018_NonEGU_NIFV3_1.mdb	Dec. 4, 2006	Version 3.1 of 2018 BOTW nonEGU source NIF inventory
MANEVU_BOTW2009_NonEGU_IDAV3_1.txt	Nov. 22, 2006	Version 3.1 of 2009 BOTW nonEGU source inventory in SMOKE IDA format
MANEVU_BOTW2012_NonEGU_IDAV3_1.txt	Nov. 22, 2006	Version 3.1 of 2012 BOTW nonEGU source inventory in SMOKE IDA format
MANEVU_BOTW2018_NonEGU_IDA3V_1.txt	Nov. 22, 2006	Version 3.1 of 2018 BOTW nonEGU source inventory in SMOKE IDA format
MANEVU OTB BOTW NonEGU V3_1 State Summary.xls	Nov. 22, 2006	Spreadsheet with state totals by pollutant for all nonEGU sources
MANEVU OTB BOTW NonEGU V3_1 State SCC Summary.xls	Dec. 4, 2006	Spreadsheet with SCC totals by state and pollutant for all nonEGU sources.

Table 5-6 NonEGU Point Sources
OTB/OTW and BOTW Annual CO Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	2,157	2,251	2,251	2,306	2,306	2,415	2,415
DE	8,812	9,037	9,037	8,748	8,748	8,651	8,651
DC	247	283	283	299	299	327	327
ME	9,043	10,147	10,147	10,467	10,467	11,433	11,433
MD	94,536	104,012	104,012	111,174	111,174	141,342	141,342
MA	10,793	12,027	12,027	12,552	12,552	13,426	13,426
NH	774	858	858	871	871	907	907
NJ	8,209	10,076	10,076	10,806	10,806	12,244	12,244
NY	53,259	61,411	61,411	65,541	65,541	78,876	78,876
PA	105,815	116,430	116,430	121,251	121,251	140,908	140,908
RI	1,712	1,764	1,764	1,821	1,821	1,927	1,927
VT	220	250	250	254	254	267	267
Total	**295,577**	**328,546**	**328,546**	**346,090**	**346,090**	**412,723**	**412,723**

No BOTW controls were considered for CO.

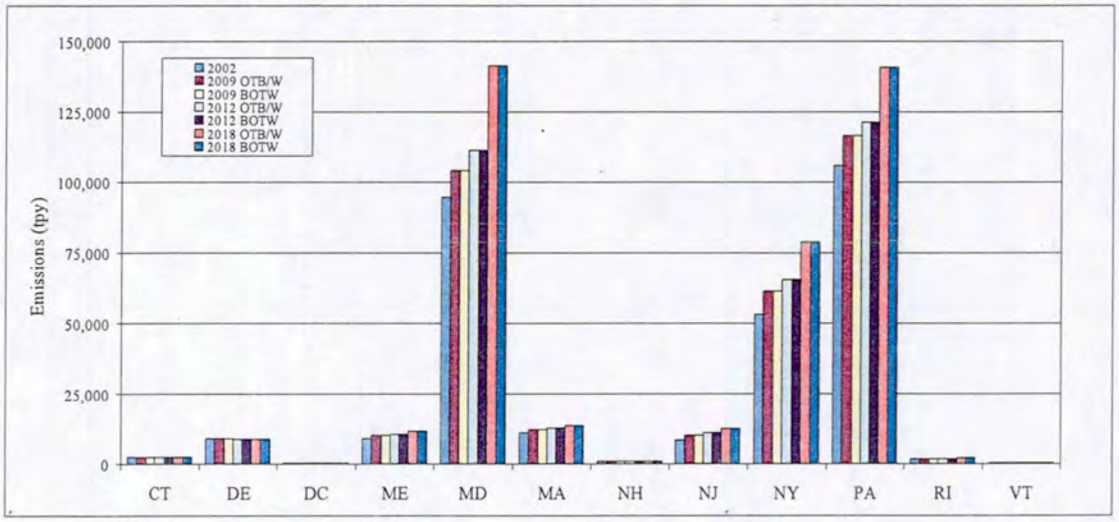


**Table 5-7 NonEGU Point Sources
OTB/OTW and BOTW Annual NH3 Emission Projections
(tons per year)**

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	0	0	0	0	0	0	0
DE	153	145	145	138	138	134	134
DC	4	5	5	5	5	5	5
ME	700	796	796	809	809	859	859
MD	305	347	347	366	366	410	410
MA	462	510	510	521	521	563	563
NH	37	46	46	50	50	60	60
NJ	0	0	0	0	0	0	0
NY	1,027	1,081	1,081	1,128	1,128	1,296	1,296
PA	1,170	1,307	1,307	1,363	1,363	1,591	1,591
RI	58	64	64	68	68	68	68
VT	0	0	0	0	0	0	0
Total	**3,916**	**4,301**	**4,301**	**4,448**	**4,448**	**4,986**	**4,986**

No BOTW controls were considered for NH3.

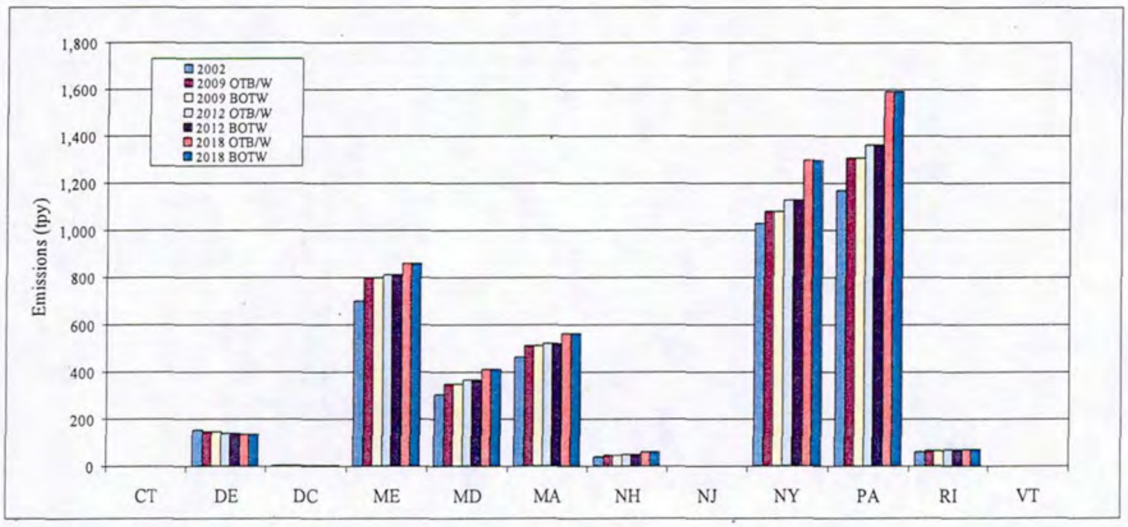


**Table 5-8 NonEGU Point Sources
OTB/OTW and BOTW Annual NOx Emission Projections
(tons per year)**

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	6,773	7,236	6,820	7,465	7,047	7,921	7,501
DE	4,372	4,076	4,076	4,135	4,135	4,246	4,246
DC	480	548	548	577	577	627	627
ME	12,108	14,285	12,914	14,661	13,183	15,753	14,137
MD	21,940	19,401	16,015	20,399	16,819	22,797	18,888
MA	18,292	20,603	20,047	21,372	20,768	23,040	22,301
NH	1,188	1,384	1,120	1,394	1,131	1,435	1,169
NJ	15,812	16,498	16,463	17,091	15,901	18,805	17,464
NY	34,253	33,648	28,529	34,586	29,256	37,133	31,305
PA	89,136	89,932	76,215	93,526	72,779	103,137	79,186
RI	2,308	2,449	2,449	2,471	2,471	2,442	2,442
VT	386	462	462	460	460	466	466
Total	**207,048**	**210,522**	**185,658**	**218,137**	**184,527**	**237,802**	**199,732**

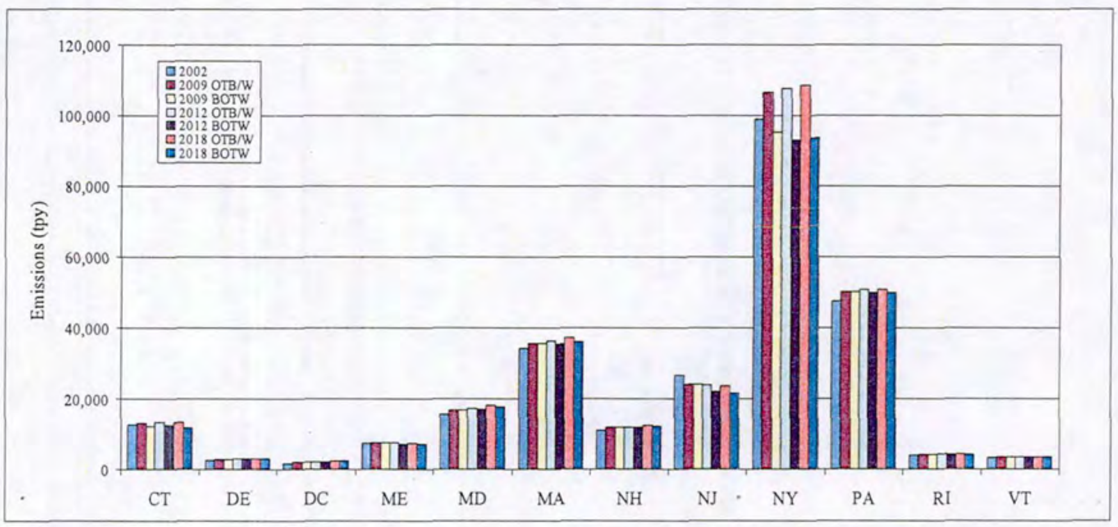


Table 5-9 NonEGU Point Sources
OTB/OTW and BOTW Annual PM10-PRI Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	990	1,035	1,035	1,058	1,058	1,106	1,104
DE	1,820	1,486	1,486	1,475	1,475	1,487	1,487
DC	157	178	178	186	182	198	194
ME	6,120	7,088	7,088	7,133	7,114	7,496	7,477
MD	4,739	4,797	4,797	5,040	5,039	5,828	5,827
MA	4,212	5,006	5,006	5,088	5,004	5,314	5,227
NH	918	1,084	1,084	1,097	1,097	1,129	1,129
NJ	3,439	4,205	4,205	4,417	4,412	4,959	4,953
NY	5,072	5,221	5,221	5,444	5,395	6,098	6,048
PA	23,282	25,169	25,169	26,307	26,258	29,516	29,466
RI	296	333	333	331	318	330	316
VT	235	267	267	272	272	296	296
Total	**51,280**	**55,869**	**55,869**	**57,848**	**57,624**	**63,757**	**63,524**

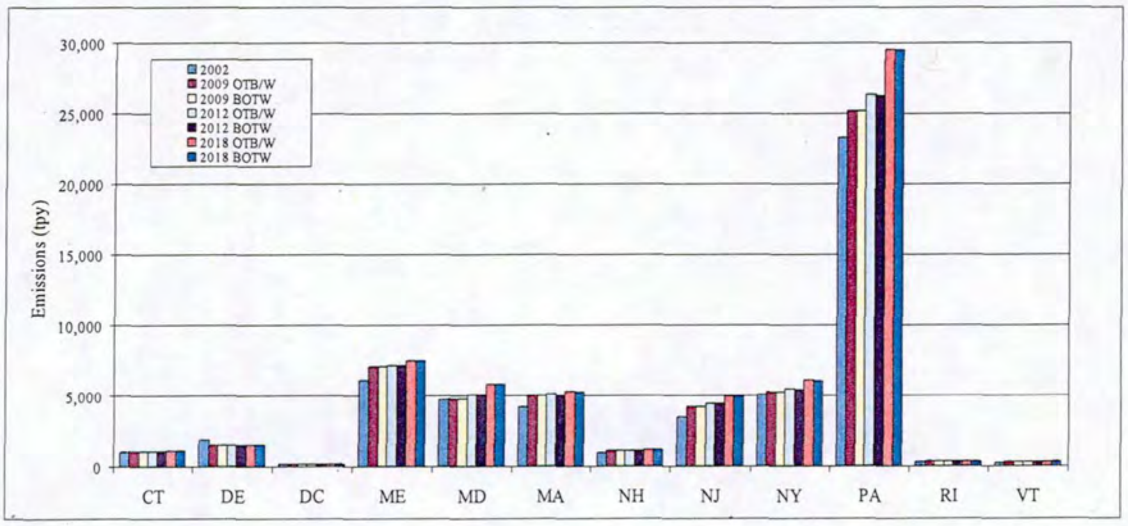


Table 5-10 NonEGU Point Sources
OTB/OTW and BOTW Annual PM25-PRI Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	822	871	871	894	894	939	937
DE	1,606	1,256	1,256	1,245	1,245	1,254	1,254
DC	128	145	145	152	149	164	161
ME	4,899	5,675	5,675	5,690	5,678	5,935	5,922
MD	2,772	2,861	2,861	3,011	3,010	3,503	3,501
MA	2,953	3,554	3,554	3,574	3,510	3,660	3,594
NH	857	1,008	1,008	1,021	1,021	1,052	1,052
NJ	2,947	3,588	3,588	3,764	3,760	4,234	4,230
NY	3,355	3,535	3,535	3,688	3,646	4,161	4,117
PA	12,360	13,578	13,578	14,159	14,114	15,878	15,831
RI	180	200	200	198	188	194	184
VT	198	226	226	229	229	246	246
Total	**33,077**	**36,497**	**36,497**	**37,625**	**37,444**	**41,220**	**41,029**

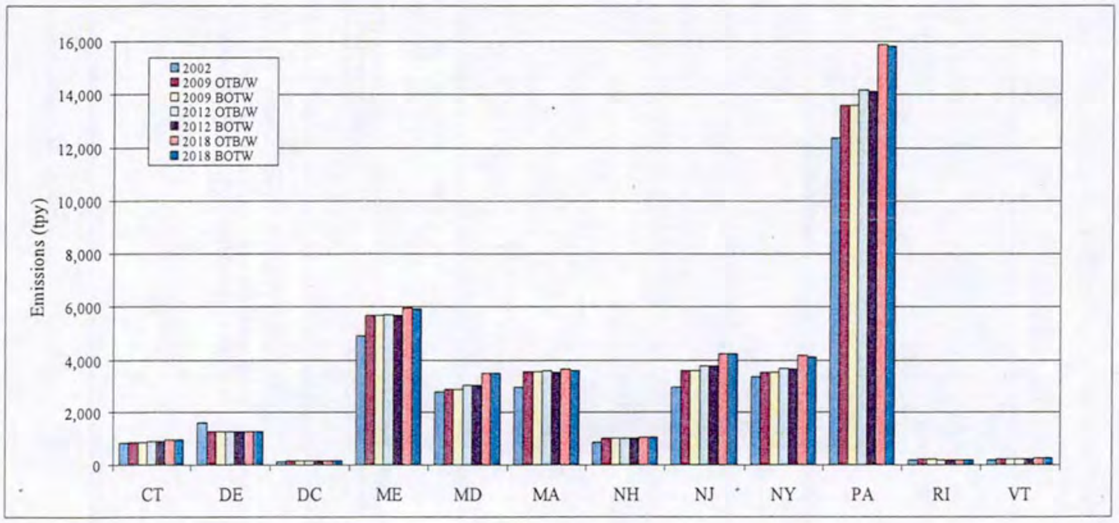


**Table 5-11 NonEGU Point Sources
OTB/OTW and BOTW Annual SO2 Emission Projections
(tons per year)**

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	2,438	2,528	2,528	2,567	2,567	2,644	2,596
DE	35,706	7,117	7,117	7,401	7,401	7,610	7,610
DC	618	707	707	735	533	780	554
ME	14,412	18,656	18,656	18,492	18,393	18,794	18,692
MD	34,193	34,223	34,223	35,373	35,342	38,921	38,886
MA	14,766	18,185	18,185	18,442	17,305	18,955	17,778
NH	2,436	3,099	3,099	3,098	3,098	3,114	3,099
NJ	9,797	7,141	7,141	7,234	7,196	7,855	7,816
NY	58,227	62,922	62,922	64,484	64,432	67,545	67,491
PA	88,259	90,735	90,735	93,441	93,206	99,924	99,681
RI	2,651	3,163	3,163	3,182	3,018	3,164	3,000
VT	874	1,182	1,182	1,147	1,147	1,127	1,127
Total	**264,377**	**249,658**	**249,658**	**255,596**	**253,638**	**270,433**	**268,330**

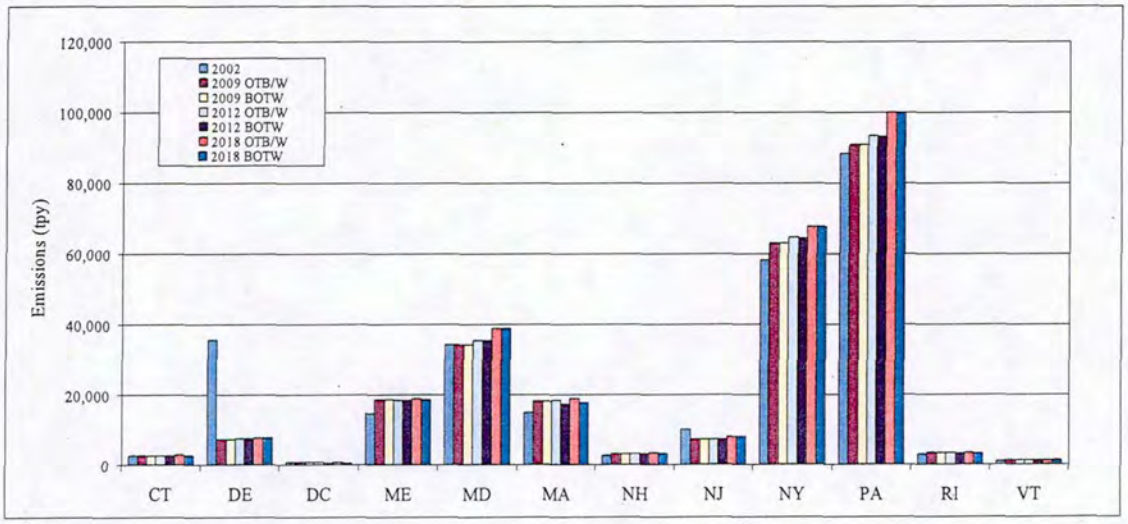
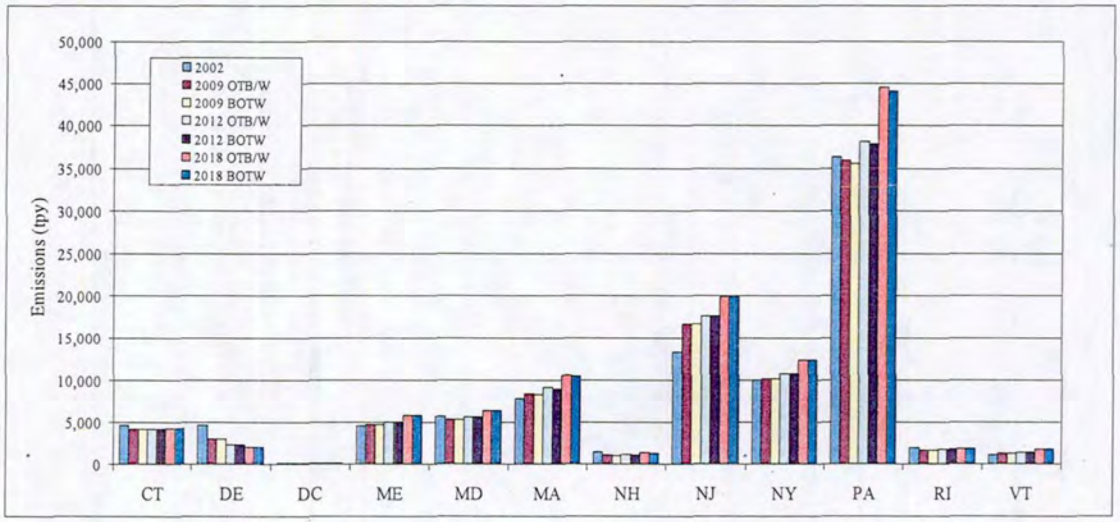


Table 5-12 NonEGU Point Sources
OTB/OTW and BOTW Annual VOC Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	4,604	4,114	4,111	4,152	4,149	4,230	4,227
DE	4,645	2,987	2,981	2,311	2,305	1,993	1,987
DC	69	72	72	75	75	85	85
ME	4,477	4,740	4,740	4,985	4,985	5,709	5,708
MD	5,676	5,297	5,279	5,578	5,559	6,301	6,279
MA	7,794	8,381	8,273	9,061	8,940	10,564	10,418
NH	1,459	1,060	1,005	1,132	1,069	1,294	1,219
NJ	13,318	16,702	16,702	17,621	17,621	19,915	19,915
NY	9,933	10,157	10,141	10,750	10,732	12,354	12,333
PA	36,326	35,875	35,548	38,162	37,795	44,537	44,085
RI	1,898	1,640	1,628	1,695	1,683	1,812	1,799
VT	1,079	1,254	1,238	1,365	1,347	1,730	1,707
Total	**91,278**	**92,279**	**91,718**	**96,887**	**96,260**	**110,524**	**109,762**



5.2 AREA SOURCES

This Section describes the analysis of the OTC and MANE-VU control measures to reduce emissions from area sources. The control measures included in this analysis reduce emissions for the following pollutants and area source categories:

- NOx measures: ICI boilers (natural gas, #2 fuel oil, #4/#6 fuel oil, and coal) and residential and commercial home heating oil;
- Primary PM10 and PM2.5 measures: residential and commercial home heating oil;
- SO2 measures: residential and commercial home heating oil, and ICI boilers (distillate oil).
- VOC measures: adhesives and sealants, emulsified and cutback asphalt paving, consumer products, and portable fuel containers;

For the MANE-VU modeling inventory, each state was asked to complete a matrix identify which control measures to include and in which years the control measure should be applied. Tables 5.13, 5.14, and 5.15 summarize the staff recommendations for control measures to include in the BOTW regional modeling inventory for NOx, SO2, and VOC respectively. The following subsections describe the emission reductions anticipated for each of the area source control measures.

5.2.1 Adhesives and Sealants

The OTC 2006 model rule for adhesives and sealants is based on the reasonably available control technology (RACT) and best available retrofit control technology (BARCT) determination by the California Air Resources Board (CARB) developed in 1998. Adhesive and sealant emission sources are classified as both point sources and area sources. About 96 percent of adhesive and sealant VOC emissions in the OTC states fall into the area source category. The remaining four percent of the VOC emissions are included in the point source inventory.

The emission reduction benefit estimation methodology for area sources is based on information developed and used by CARB for their RACT/BARCT determination in 1998. CARB estimates that the total industrial adhesive and sealant emissions in California to be about 45 tons per day (tpd). Solvent-based adhesive and sealant emissions are estimated to be about 35 tpd of VOC and water-based adhesive and sealant emissions are about 10 tpd of VOC.

Table 5.13 State Staff Recommendations for Control Measures to Include in BOTW Regional Modeling – NOx Area Sources

	ICI Boilers < 25 mmBTU/hour			ICI Boilers 25-50 mmBtu/hour			ICI Boilers 50-100 mmBtu/hour			Residential and Commercial Home Heating Oil		
State	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
CT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
DE	No	No	No	No	No	No	No	No	No	No	No	No
DC	No	No	No	No	No	No	No	No	No	No	Yes	Yes
ME	No	No	No	No	No	No	No	No	No	No	Yes	Yes
MD	No	No	No	No	No	No	No	No	No	No	Yes	Yes
MA	No	No	No	No	No	No	No	No	No	No	Yes	Yes
NH	No	No	No	No	No	No	No	No	No	No	No	Yes
NJ	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
NY	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
PA	No	No	No	No	No	No	No	No	No	No	Yes	Yes
RI	No	No	No	No	No	No	No	No	No	No	Yes	Yes
VT[1]	No	No	No	No	No	No	No	No	No	No	No	No

Yes - Include emission reductions from OTC 2006 control measure in modeling inventory
No - Do not include emission reduction from OTC 2006 control measure in modeling inventory

Table 5.14 State Staff Recommendations for Control Measures to Include in BOTW Regional Modeling – SO2 Area Sources

	ICI Boilers < 25 mmBTU/hour			ICI Boilers 25-50 mmBtu/hour			ICI Boilers 50-100 mmBtu/hour			Residential Home Heating Oil		
State	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
CT	No	No	No	No	No	No	No	No	No	No	No	Yes
DE	No	No	No	No	No	No	No	No	No	No	No	No
DC	No	No	No	No	No	No	No	No	No	No	Yes	Yes
ME	No	No	No	No	No	No	No	No	No	No	Yes	Yes
MD	No	No	No	No	No	No	No	No	No	No	Yes	Yes
MA	No	No	No	No	No	No	No	No	No	No	Yes	Yes
NH	No	No	No	No	No	No	No	No	No	No	No	Yes
NJ	No	No	No	No	No	No	No	No	No	No	Yes	Yes
NY	No	No	No	No	No	No	No	No	No	No	Yes	Yes
PA	No	No	No	No	No	No	No	No	No	No	Yes	Yes
RI	No	No	No	No	No	No	No	No	No	No	Yes	Yes
VT[1]	No	No	No	No	No	No	No	No	No	No	No	No

Yes - Include emission reductions from OTC 2006 control measure in modeling inventory
No - Do not include emission reduction from OTC 2006 control measure in modeling inventory

Table 5.15 State Staff Recommendations for Control Measures to Include in BOTW Regional Modeling – VOC Area Sources

	Adhesives and Sealants			Emulsified and Cutback Asphalt Paving			Consumer Products			Portable Fuel Containers		
State	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
CT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DE	Yes	Yes	Yes	No[2]	No[2]	No[2]	Yes	Yes	Yes	Yes	Yes	Yes
DC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ME	Yes	Yes	Yes	No[3]	No[3]	No[3]	Yes	Yes	Yes	Yes	Yes	Yes
MD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
NH	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NJ	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NY	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PA	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VT[1]	No	No	No	No	No	No	No	No	No	No	No	No

Yes - Include emission reductions from OTC 2006 control measure in modeling inventory
No - Do not include emission reduction from OTC 2006 control measure in modeling inventory

1) Vermont indicated that the modeling inventory should not reflect anything beyond the 2002 OTC control level for these source categories in Vermont.
2) Delaware's existing asphalt paving regulations are more stringent than the OTC 2006 control measure.
3) Maine has not yet determined whether to include emission reductions from the OTC 2006 control measure for asphalt paving. Maine's inventory includes emissions only from cutback asphalt; no emissions are reported for emulsified asphalt.

CARB estimated that emission reductions achieved by statewide compliance with the VOC limits in the RACT/BARCT determination will range from approximately 29 to 35 tpd (CARB 1998, pg. 18). These emission reductions correspond to a 64.4 to 77.8 percent reduction from uncontrolled levels. For OTC modeling purposes, we used the lower end of this range (i.e., 64.4 percent reduction) to estimate the emission benefit for area sources due to the OTC 2006 model rule.

5.2.2 Asphalt Paving

The OTC current guideline for asphalt paving calls for a complete ban on the use of cutback asphalt during the ozone season and limits the VOC content of emulsified asphalt to two percent or less. The proposal is still under evaluation. A 20 percent reduction in emissions from emulsified asphalt was assumed for the modeling inventory.

The current regulations in all MANE-VU states generally ban the use of cutback asphalt during the ozone season. In some states, there are a few exemptions from the ban that allow for the use of cutback during the ozone season. It has not yet been determined whether states will modify their cutback asphalt rules to eliminate the exemptions. Since the VOC emissions from the use of cutback asphalt during the ozone season are generally very small, MACTEC assumed that there will be no additional emission reductions from the use of cutback asphalt during the ozone season.

The emission reductions resulting from the two percent VOC content limit on emulsified asphalt depend on the baseline VOC content of emulsified asphalt. The baseline VOC content may range from 0 to 12 percent. New Jersey used a VOC content of 8 percent in their baseline emission calculations (based on the 8 percent limit in their current rule). Reducing the VOC content to 2 percent in New Jersey will result in a 75 percent reduction. Delaware already bans the use of emulsified asphalt that contains any VOC, so there is no reduction in Delaware. Several other states used an average VOC content of 2.5 percent when developing their emission inventory. Thus, reducing the average VOC content from 2.5 percent to 2.0 percent results in a 20 percent reduction in VOC emissions. For States that did not supply a baseline VOC content for asphalt paving, we used the 20 percent reduction in VOC emissions from emulsified asphalt paving during the ozone season.

5.2.3 Consumer Products

The OTC 2006 model rule will modify the OTC 2001 model rule based on amendments adopted by CARB in July 2005. The emission reduction benefit estimation methodology is based on information developed by CARB. CARB estimates 6.05 tons per day of VOC reduced from their July 2005 amendments (CARB 2004, pg. 8), excluding the benefits from the two products (anti-static products and shaving gels) with compliance dates in 2008 or 2009. This equates to about 2,208 tons per year. The population of California as of July 1, 2005 is 36,132,147 (Census 2006). On a per capita basis, the emission reduction from the CARB July 2005 amendments equals 0.122 lbs/capita.

Since the OTC's 2006 control measure is very similar to the CARB July 2005 amendments (with the exclusion of the anti-static products and shaving gel 2008/2009 limits), the per capita emission reductions are expected to be the same in the OTR. The per capita factor after the implementation of the OTC 2001 model rule is 6.06 lbs/capita (Pechan 2001, pg. 8). The percentage reduction from the OTC's 2006 control measure was computed as shown below:

Current OTC Emission Factor	=	6.06 lbs/capita
Benefit from CARB 2005 amendments	=	0.122 lbs/capita
Percent Reduction	=	100%*(1 - (6.06 – 0.122)/6.06)
	=	2.0%

The 2.0% reduction will be applied to all states except Vermont, which indicated that they do not want the modeling inventory to reflect anything beyond the 2002 OTC control level for consumer products in Vermont.

5.2.4 Portable Fuel Containers

The OTC 2006 model rule will modify the OTC 2001 model rule based on amendments adopted by CARB in 2006. Estimated emission reductions were based on information compiled by CARB to support their recent amendments. CARB estimated that PFC emissions in 2015 will be 31.9 tpd in California with no additional controls or amendments to the 2000 PFC rules. CARB further estimates that the 2006 amendment will reduce emission from PFCs by 18.4 tpd in 2015 in California compared to the 2000 PFC regulations. Thus, at full implementation, the expected incremental reduction is approximately 58 percent, after an estimated 75 percent reduction from the original 2000 rule (CARB later adjusted the reduction to 65 percent due to unanticipated problems with spillage from the new cans).

The OTC calculations assume that States will adopt the rule by July 2007 and will provide manufacturers one year from the date of the rule to comply. Thus, new compliant PFCs will not be on the market until July 2008. Assuming a 10-year turnover to compliant cans, only 10 percent of the existing inventory of PFCs will comply with the new requirements in the summer of 2009. Therefore, only 10 percent of the full emission benefit estimated by CARB will occur by 2009 – the incremental reduction will be about 5.8 percent in

2009. In 2012, there will be a 40 percent turnover to compliant cans, resulting in an incremental reductions of about 23.2 percent. By 2018, the will be 100 percent penetration to compliant PFCs, resulting in an incremental reduction of 58 percent in 2018.

The emission reductions from the 2006 OTC PFC model rule were calculated only for the emissions accounted for in the area source inventory. Additional benefits (not estimated for this report) would be expected from equipment refueling vapor displacement and spillage that is accounted for in the nonroad inventory.

5.2.5 Industrial/Commercial/Institutional Boilers

In Resolution 06-02, the OTC Commissioners recommended that OTC member states pursue as necessary and appropriate state-specific rulemakings or other implementation methods to establish emission reduction percentages, emission rates or technologies for ICI boilers based on guidelines that varied by boiler size and fuel type. Specifically, the following guidelines were provided:

	NOx Reduction from 2009 Base Emissions by Fuel Type			
Boiler Size (mmBtu/hour)	**Natural Gas**	**#2 Fuel Oil**	**#4/#6 Fuel Oil**	**Coal**
< 25	10	10	10	10
25 to 50	50	50	50	50*
50 to 100	10	10	10	10*
100 to 250	75	40	40	40*
>250	**	**	**	**

* Resolution 06-02 did not specify a percent reduction for coal; for modeling purposes, the same percent reduction specified for #4/#6 fuel oil was used for coal

** Resolution 06-02 specified the reduction for > 250mmBtu/hour boilers to be the "same as EGUs of similar size." The OTC Commissioners have not yet recommended an emission rate or percent reduction for EGUs. As a result, no reductions for ICI boilers > 250 mmBtu/hour were included in the BOTW inventory.

Since the above guidelines vary by boiler size and fuel type, the specific percent reduction applied to an area source category depends on the SCC and design capacity of the source. The SCC identifies the fuel type (for example, SCC 21-02-004-xxx describes distillate oil-fired industrial boilers, SCC 21-02-006-xxx describes natural gas-fired industrial boilers). The area source inventory does not contain any information on the sizes of the units included in the inventories. To apportion area source emissions to the boiler size ranges listed above, MACTEC used data from the *Characterization of the U.S. Industrial/Commercial Boiler Population* (May 2005, Oak Ridge National Laboratory). We used the national estimates of boiler capacity by size from Table ES-1 of the Oak

Ridge report to calculate the percentage of total boiler capacity in each size range. Since the Oak Ridge report distinguished between industrial boilers and commercial/institutional boilers, we developed separate profiles for industrial boilers and for commercial/institutional boilers. We used these boiler size profiles to calculate weighted average percent reductions industrial boilers by fuel type and commercial/institutional boilers by fuel type.

5.2.6 Residential and Commercial Heating Oil

The BOTW control measure for heating oil is based on NESCAUM's report entitled "Low Sulfur Heating Oil in the Northeast States: An Overview of Benefits, Costs and Implementation Issues." NESCAUM estimates that reducing the sulfur content of heating oil from 2,000 ppm to 500 ppm lowers SO2 emissions by 75 percent, PM emissions by 80 percent, NOx emissions by 10 percent. The 500 ppm sulfur heating oil is not expected to available on a widespread basis until 2012 at the earliest. These percent reductions were applied to residential distillate oil category (SCC 21-04-004-xxx) and commercial distillate oil category (SCC 21-03-004-xxx). These percent reductions were applied based on the state's recommendations in the matrix which identifies control measures to include and in which years the control measure should be accounted for in the modeling inventory.

5.2.7 BOTW Area Source NIF, SMOKE, and Summary Files

The Version 3 file names and descriptions delivered to MARAMA are shown in Table 5-16.

Table E-1 shows the anticipated percent reductions by SCC and year for the nonEGU point source BOTW control measures.

5.2.8 BOTW Area Source Emission Summaries

Emission summaries by state, year, and pollutant are presented in Tables 5-17 through 5-23 for CO, NH3, NOx, PM10-PRI, PM25-PRI, SO2, and VOC, respectively.

Table 5-16 BOTW Area Source NIF, IDA, and Summary File Names

File Name	Date	Description
MANEVU_BOTW2009_Area_NIFV3_2.mdb	Nov. 9, 2006	Version 3.2 of 2009 BOTW area source NIF inventory
MANEVU_BOTW2012_Area_NIFV3_2.mdb	Nov. 9, 2006	Version 3.2 of 2012 BOTW area source NIF inventory
MANEVU_BOTW2018_Area_NIFV3_2.mdb	Nov. 9, 2006	Version 3.2 of 2018 BOTW area source NIF inventory
MANEVU_BOTW2009_Area_IDAV3_2.txt	Nov. 20, 2006	Version 3.2 of 2009 BOTW area source inventory in SMOKE IDA format
MANEVU_BOTW2012_Area_IDAV3_2.txt	Nov. 20, 2006	Version 3.2 of 2012 BOTW area source inventory in SMOKE IDA format
MANEVU_BOTW2018_Area_IDA3V_2.txt	Nov. 20, 2006	Version 3.2 of 2018 BOTW area source inventory in SMOKE IDA format
MANEVU OTB BOTW Area V3_2 State Summary.xls	Nov. 8, 2006	Spreadsheet with state totals by pollutant for all area sources
MANEVU OTB BOTW Area V3_2 State SCC Summary.xls	Nov. 8, 2006	Spreadsheet with SCC totals by state and pollutant for all area sources.

Table 5-17 Area Sources
OTB/OTW and BOTW Annual CO Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	70,198	65,865	65,865	63,874	63,874	59,797	59,797
DE	14,052	15,395	15,395	15,233	15,233	14,864	14,864
DC	2,300	2,417	2,417	2,460	2,460	2,512	2,512
ME	109,223	102,743	102,743	99,877	99,877	94,181	94,181
MD	141,178	143,653	143,653	144,233	144,233	144,649	144,649
MA	137,496	132,797	132,797	130,255	130,255	125,205	125,205
NH	79,647	76,504	76,504	75,319	75,319	73,038	73,038
NJ	97,657	90,432	90,432	88,048	88,048	83,119	83,119
NY	356,254	336,576	336,576	327,118	327,118	307,659	307,659
PA	266,935	266,887	266,887	264,012	264,012	257,396	257,396
RI	8,007	8,007	8,007	8,026	8,026	8,024	8,024
VT	43,849	42,683	42,683	42,172	42,172	41,283	41,283
Total	**1,326,796**	**1,283,959**	**1,283,959**	**1,260,627**	**1,260,627**	**1,211,727**	**1,211,727**

No BOTW controls were considered for CO.

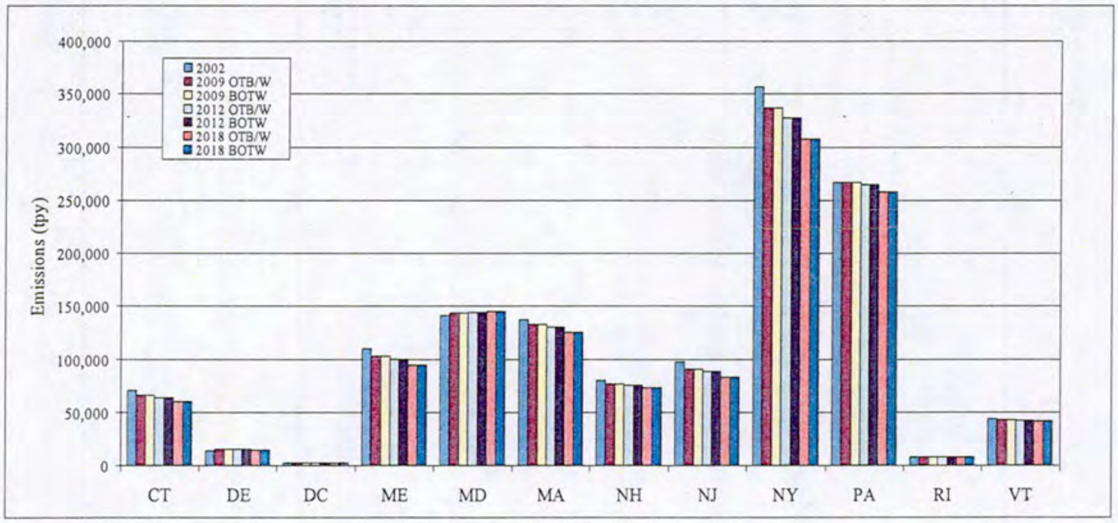


Table 5-18 Area Sources
OTB/OTW and BOTW Annual NH3 Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	5,318	5,208	5,208	5,156	5,156	5,061	5,061
DE	13,279	13,316	13,316	13,328	13,328	13,342	13,342
DC	14	16	16	16	16	17	17
ME	8,747	10,453	10,453	11,116	11,116	12,312	12,312
MD	25,834	31,879	31,879	34,222	34,222	38,155	38,155
MA	18,809	19,131	19,131	19,275	19,275	19,552	19,552
NH	2,158	2,466	2,466	2,584	2,584	2,789	2,789
NJ	17,572	19,457	19,457	20,154	20,154	21,435	21,435
NY	67,422	81,626	81,626	87,116	87,116	96,078	96,078
PA	79,911	98,281	98,281	105,418	105,418	117,400	117,400
RI	883	945	945	972	972	1,025	1,025
VT	9,848	12,156	12,156	13,062	13,062	14,580	14,580
Total	**249,795**	**294,934**	**294,934**	**312,419**	**312,419**	**341,746**	**341,746**

No BOTW controls were considered for NH3.

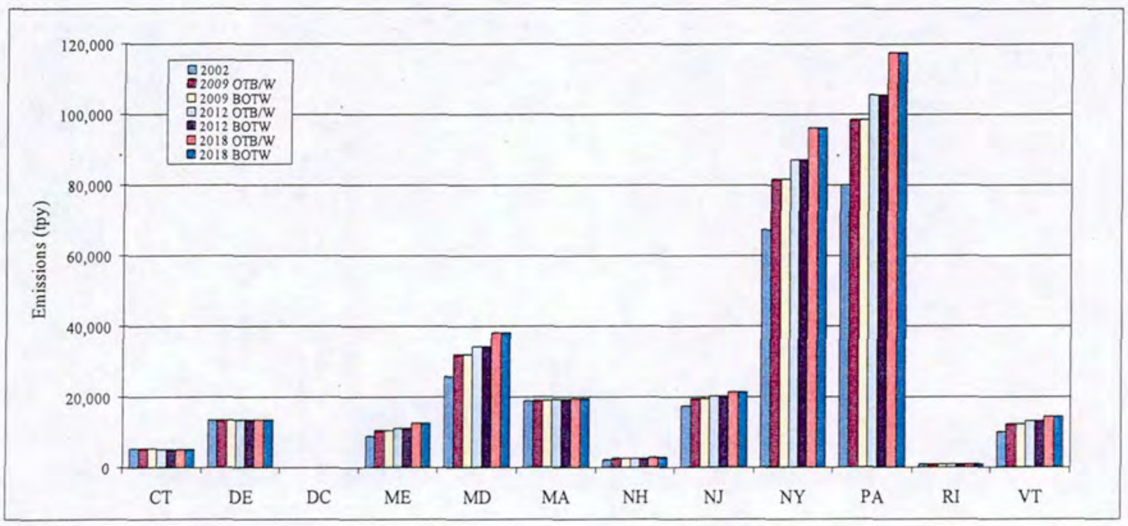


Table 5-19 Area Sources
OTB/OTW and BOTW Annual NOx Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	12,689	13,173	12,245	13,342	12,389	13,388	11,795
DE	2,608	2,821	2,821	2,913	2,913	3,014	3,014
DC	1,644	1,961	1,961	2,081	2,052	2,259	2,229
ME	7,360	7,477	7,477	7,486	7,095	7,424	7,036
MD	15,678	16,858	16,858	17,315	17,007	18,073	17,746
MA	34,281	35,732	35,732	36,331	35,321	37,187	36,199
NH	10,960	11,879	11,879	12,055	12,055	12,430	12,180
NJ	26,692	24,032	24,032	23,981	21,976	23,660	21,684
NY	98,803	106,375	95,190	107,673	92,935	108,444	93,639
PA	47,591	50,162	50,162	50,793	49,773	50,829	49,829
RI	3,886	4,149	4,149	4,260	4,112	4,397	4,249
VT	3,208	3,419	3,419	3,429	3,429	3,430	3,430
Total	**265,400**	**278,038**	**265,925**	**281,659**	**261,057**	**284,535**	**263,030**

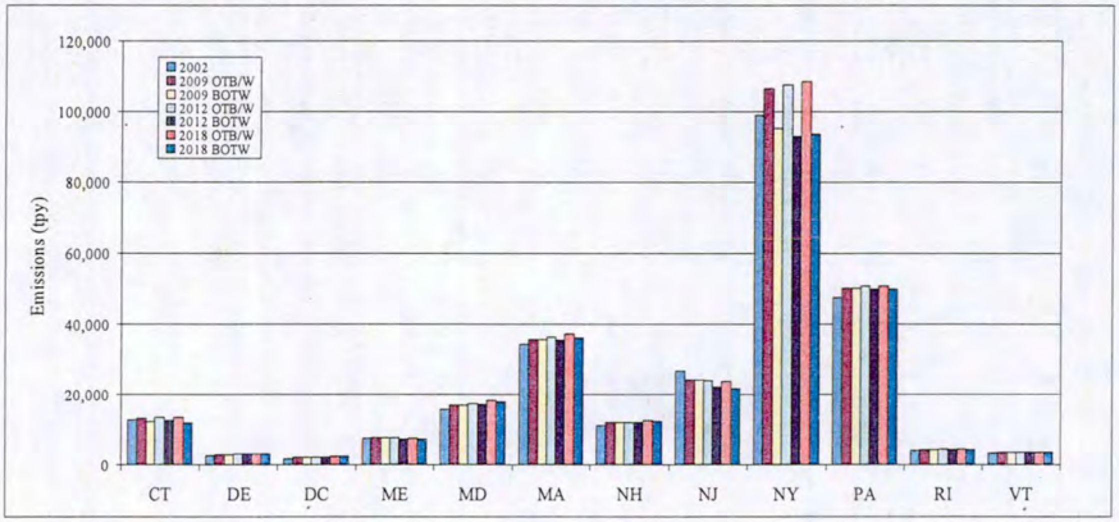


Table 5-20 Area Sources
OTB/OTW and BOTW Annual PM10-PRI Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	48,281	48,970	48,970	49,004	49,004	49,479	48,734
DE	13,039	13,928	13,928	14,236	14,236	14,844	14,844
DC	3,269	3,511	3,511	3,605	3,547	3,825	3,762
ME	168,953	175,979	175,979	179,689	179,004	189,619	188,928
MD	95,060	105,944	105,944	110,141	109,829	117,396	117,066
MA	192,860	198,668	198,668	200,692	200,215	204,922	204,456
NH	43,328	46,060	46,060	47,187	47,187	49,801	49,544
NJ	61,601	61,684	61,684	61,284	60,916	60,880	60,519
NY	369,595	382,124	382,124	385,925	383,234	392,027	389,385
PA	391,897	421,235	421,235	432,844	431,787	454,970	453,934
RI	8,295	8,962	8,962	9,244	8,976	9,797	9,514
VT	56,131	60,521	60,521	62,465	62,465	66,916	66,916
Total	**1,452,309**	**1,527,586**	**1,527,586**	**1,556,316**	**1,550,400**	**1,614,476**	**1,607,602**

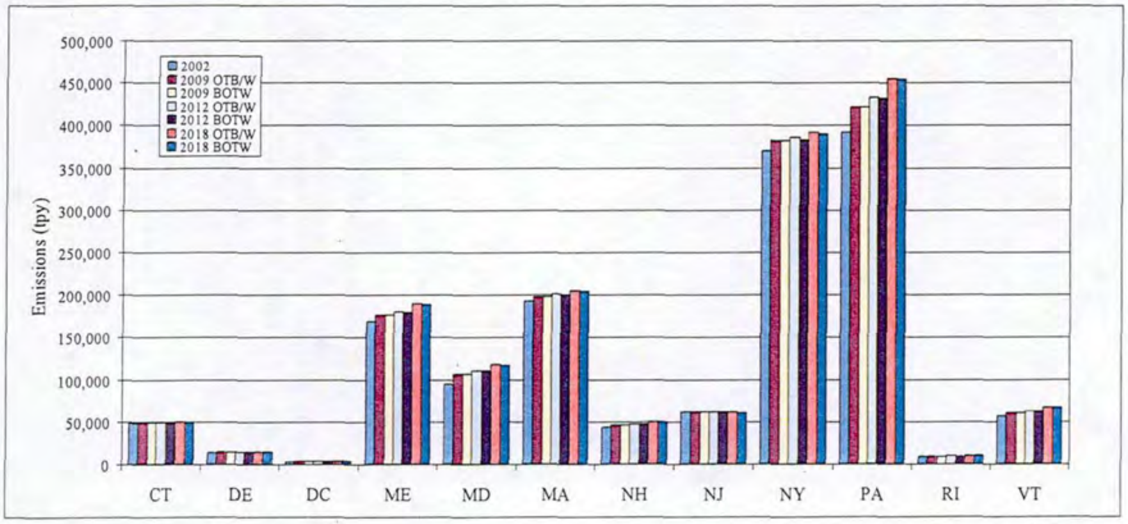


Table 5-21 Area Sources
OTB/OTW and BOTW Annual PM25-PRI Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	14,247	13,766	13,766	13,517	13,517	13,033	12,366
DE	3,204	3,387	3,387	3,403	3,403	3,426	3,426
DC	805	860	860	879	827	917	860
ME	32,774	33,026	33,026	33,189	32,576	33,820	33,201
MD	27,318	28,923	28,923	29,508	29,228	30,449	30,153
MA	42,083	43,121	43,121	43,186	42,820	43,438	43,080
NH	17,532	17,965	17,965	18,050	18,050	18,316	18,087
NJ	19,350	18,590	18,590	18,271	17,924	17,653	17,313
NY	87,154	87,576	87,576	87,260	85,011	86,422	84,211
PA	74,925	79,169	79,169	80,728	79,775	83,570	82,637
RI	2,064	2,184	2,184	2,232	1,996	2,316	2,068
VT	11,065	11,482	11,482	11,652	11,652	12,059	12,059
Total	**332,521**	**340,049**	**340,049**	**341,875**	**336,779**	**345,419**	**339,461**

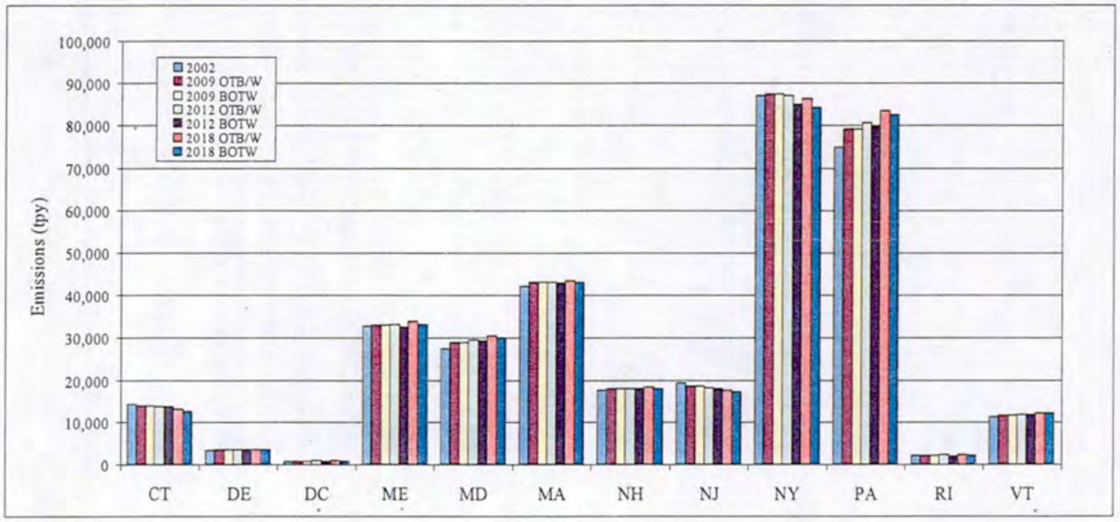


Table 5-22 Area Sources
OTB/OTW and BOTW Annual SO2 Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	12,418	12,581	12,581	12,604	12,604	12,184	3,398
DE	1,588	1,599	1,599	1,602	1,602	1,545	1,545
DC	1,337	1,487	1,487	1,541	499	1,632	522
ME	13,149	13,776	13,776	13,846	4,897	13,901	4,940
MD	12,393	13,685	13,685	14,074	8,762	14,741	9,118
MA	25,488	25,961	25,961	26,029	8,414	25,570	8,357
NH	7,072	7,463	7,463	7,470	7,470	7,421	3,118
NJ	10,744	10,672	10,672	10,697	4,435	10,510	4,374
NY	130,409	139,589	139,589	140,154	98,160	141,408	100,452
PA	63,679	67,535	67,535	67,446	49,212	66,363	48,475
RI	4,557	5,024	5,024	5,189	1,316	5,398	1,368
VT	4,087	4,646	4,646	4,687	4,687	4,764	4,764
Total	**286,921**	**304,018**	**304,018**	**305,339**	**202,058**	**305,437**	**190,431**

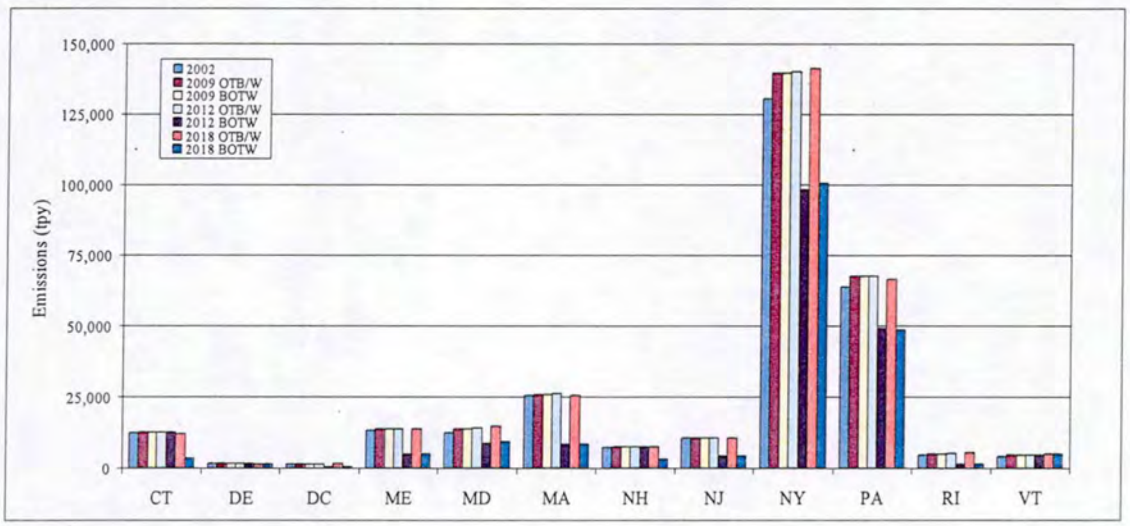
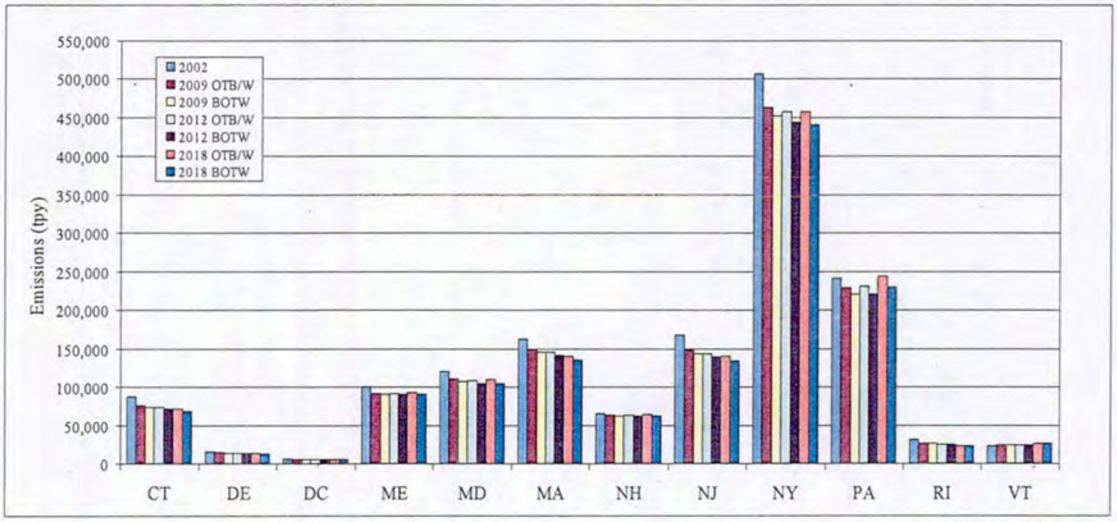


Table 5-23 Area Sources
OTB/OTW and BOTW Annual VOC Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	87,302	75,693	73,738	73,560	71,249	71,274	68,395
DE	15,519	14,245	13,794	13,943	13,408	13,744	13,066
DC	6,432	5,420	5,300	5,352	5,144	5,255	4,991
ME	100,621	91,910	90,869	91,667	90,457	92,410	90,866
MD	120,254	110,385	107,527	108,067	104,400	110,046	104,615
MA	162,145	148,625	145,059	145,674	140,848	140,558	134,963
NH	65,370	63,069	61,860	63,356	61,913	64,368	62,649
NJ	167,882	147,617	143,089	143,752	138,646	139,626	134,089
NY	507,292	462,811	451,669	456,856	443,940	457,421	440,892
PA	240,785	228,444	219,733	230,393	219,897	243,421	230,011
RI	31,402	26,695	26,572	25,548	25,315	23,561	23,305
VT	23,265	24,068	24,068	24,635	24,634	26,198	26,197
Total	**1,528,269**	**1,398,982**	**1,363,278**	**1,382,803**	**1,339,851**	**1,387,882**	**1,334,039**



5.3 Nonroad Mobile Sources

In the June 2007 MOU, the OTC Commissioners recommended that states pursue state-specific rulemakings for one nonroad source categories – portable fuel containers. The OTC 2006 control measure for portable fuel containers will result in addition VOC emission reduction from the refueling of nonroad equipment. However, these reductions could not be estimated due to resource and time constraints.

5.4 Electric Generating Units

In the June 2008 Statement on EGUs, the OTC Commissioners directed OTC staff to complete an evaluation and recommendations for a program beyond CAIR that includes strategies to address the base, intermediate and peak load emissions. No specific emission reduction targets were identified. States specified that no additional reductions from EGUs be included in the BOTW inventory.

5.5 Onroad Mobile Sources

In Resolution 06-02, the OTC Commissioners recommended that the OTC member states pursue a region fuel program consistent with the Energy Act of 2005. No specific emission reduction targets were identified. States specified that no additional reductions from onroad mobile sources be included in the BOTW inventory.

In the June 2007 MOU, the OTC Commissioners recommended that states pursue state-specific rulemakings to implement a mandatory diesel engine chip reflash program. It is our understanding that the emission reductions from the diesel engine chip reflash program are already accounted for in MANE-VU's OTB emission inventory.

Appendix A – NonEGU Point Source Growth Factors

Table A-1 Connecticut Growth Factors by SIC Code

SIC	GF_02_09	GF_02_12	GF_02_18	CTDOL_CAT
0181	1.0019	1.0027	1.0042	Agricultural, Crop Production
1422	0.9400	0.9143	0.8629	Mining
1429	0.9400	0.9143	0.8629	Mining
2051	0.9355	0.9079	0.8526	Manufacturing, Food
2096	0.9355	0.9079	0.8526	Manufacturing, Food
2261	0.9254	0.8934	0.8295	Manufacturing, Textile Product Mills
2262	0.9254	0.8934	0.8295	Manufacturing, Textile Product Mills
2284	0.9254	0.8934	0.8295	Manufacturing, Textile Product Mills
2298	0.9254	0.8934	0.8295	Manufacturing, Textile Product Mills
2434	1.0679	1.0969	1.1551	Manufacturing, Wood Products
2522	1.0435	1.0621	1.0994	Manufacturing, Furniture & Related
2541	1.0679	1.0969	1.1551	Manufacturing, Wood Products
2621	0.8706	0.8152	0.7043	Manufacturing, Paper
2631	0.8706	0.8152	0.7043	Manufacturing, Paper
2652	0.8706	0.8152	0.7043	Manufacturing, Paper
2653	0.8706	0.8152	0.7043	Manufacturing, Paper
2672	0.8706	0.8152	0.7043	Manufacturing, Paper
2673	0.8706	0.8152	0.7043	Manufacturing, Paper
2711	0.8386	0.7695	0.6312	Manufacturing, Printing & Related Activ
2752	0.8386	0.7695	0.6312	Manufacturing, Printing & Related Activ
2754	0.8386	0.7695	0.6312	Manufacturing, Printing & Related Activ
2759	0.8386	0.7695	0.6312	Manufacturing, Printing & Related Activ
2821	1.1024	1.1464	1.2342	Manufacturing, Chemical
2833	1.1024	1.1464	1.2342	Manufacturing, Chemical
2869	1.1024	1.1464	1.2342	Manufacturing, Chemical
2875	1.1024	1.1464	1.2342	Manufacturing, Chemical
3052	0.9591	0.9416	0.9066	Manufacturing, Plastic & Rubber Product
3069	0.9591	0.9416	0.9066	Manufacturing, Plastic & Rubber Product
3081	0.9591	0.9416	0.9066	Manufacturing, Plastic & Rubber Product
3086	0.9591	0.9416	0.9066	Manufacturing, Plastic & Rubber Product
3087	0.9591	0.9416	0.9066	Manufacturing, Plastic & Rubber Product
3272	0.9841	0.9772	0.9636	Manufacturing, Miscellaneous
3312	0.8713	0.8162	0.7059	Manufacturing, Primary Metal
3351	0.8713	0.8162	0.7059	Manufacturing, Primary Metal
3357	0.8713	0.8162	0.7059	Manufacturing, Primary Metal
3423	0.9150	0.8786	0.8057	Manufacturing, Fabricated Metal
3429	0.9150	0.8786	0.8057	Manufacturing, Fabricated Metal
3444	0.9150	0.8786	0.8057	Manufacturing, Fabricated Metal
3469	0.9150	0.8786	0.8057	Manufacturing, Fabricated Metal
3471	0.9150	0.8786	0.8057	Manufacturing, Fabricated Metal
3479	0.9150	0.8786	0.8057	Manufacturing, Fabricated Metal
3497	0.9150	0.8786	0.8057	Manufacturing, Fabricated Metal
3562	0.8778	0.8254	0.7206	Manufacturing, Machinery

SIC	GF_02_09	GF_02_12	GF_02_18	CTDOL_CAT
3569	0.8778	0.8254	0.7206	Manufacturing, Machinery
3579	0.8452	0.7788	0.6461	Manufacturing, Computer & Electronic Eq
3634	0.9149	0.8784	0.8054	Manufacturing, Electrical Equipment, Ap
3675	0.9149	0.8784	0.8054	Manufacturing, Electrical Equipment, Ap
3714	0.9705	0.9578	0.9326	Manufacturing, Transportation Equipment
3721	0.9705	0.9578	0.9326	Manufacturing, Transportation Equipment
3724	0.9705	0.9578	0.9326	Manufacturing, Transportation Equipment
3728	0.9705	0.9578	0.9326	Manufacturing, Transportation Equipment
3731	0.9705	0.9578	0.9326	Manufacturing, Transportation Equipment
3827	0.9841	0.9772	0.9636	Manufacturing, Miscellaneous
3949	0.9841	0.9772	0.9636	Manufacturing, Miscellaneous
3951	0.9841	0.9772	0.9636	Manufacturing, Miscellaneous
4226	1.0921	1.1316	1.2106	Transportation & Warehousing, Warehousi
4911	0.9550	0.9358	0.8972	Utilities
4922	0.9550	0.9358	0.8972	Utilities
4924	0.9550	0.9358	0.8972	Utilities
4931	1.1439	1.2056	1.3290	Waste Management & Remediation Services
4952	1.1439	1.2056	1.3290	Waste Management & Remediation Services
4953	1.1439	1.2056	1.3290	Waste Management & Remediation Services
4961	0.9550	0.9358	0.8972	Utilities
5171	1.0605	1.0864	1.1382	Wholesale Trade, Nondurable Goods
6036	1.0569	1.0814	1.1302	Finance & Insurance
6512	1.0197	1.0282	1.0451	Real Estate & Rental & Leasing
6513	1.0197	1.0282	1.0451	Real Estate & Rental & Leasing
7389	1.0569	1.0814	1.1302	Finance & Insurance
8051	1.0824	1.1177	1.1883	Health Care & Social Assistance, Nursin
8062	1.0583	1.0833	1.1334	Health Care & Social Assistance, Hospit
8063	1.0583	1.0833	1.1334	Health Care & Social Assistance, Hospit
8211	1.0642	1.0918	1.1468	Educational Services
8221	1.0642	1.0918	1.1468	Educational Services
8631	1.0642	1.0918	1.1468	Educational Services
8734	1.1189	1.1699	1.2718	Professional, Scientific, and Technical
9223	1.0185	1.0264	1.0423	Government
9511	1.0185	1.0264	1.0423	Government
9621	1.0185	1.0264	1.0423	Government
9711	1.0185	1.0264	1.0423	Government
3900	0.9841	0.9772	0.9636	Manufacturing, Miscellaneous
5093	1.0527	1.0754	1.1206	Wholesale Trade, Durable Goods
4200	0.9871	0.9815	0.9705	Transportation & Warehousing, Truck Tra

Table A-2 Non-EGU Point Source Growth Factors by SCC Code

See Electronic File: MANE-VU_NonEGU_gf_scc.xls

This table contains 12,791 records with NonEGU point source growth factors by county and SCC. The format for the tables is as follows:

Column A – County FIPS code

Column B – Source Classification Code (SCC)

Column C – EGAS_02_09 this is the EGAS 5.0 factor for projecting from 2002 to 2009

Column D – AEO5_02_09 this is the DOE AEO 2005 factor for projecting from 2002 to 2009

Column E – ST_02_09 this is the state-supplied factor for projecting from 2002 to 2009

Column F – GF_02_09 this is the final factor actually used for projecting from 2002 to 2009 (it is the state-supplied factor, if available; if no state-supplied factor, then it is the AEO2005 factor; if no AEO2005 factor, then it is the default EGAS 5.0 factor)

Column G – EGAS_02_12 this is the EGAS 5.0 factor for projecting from 2002 to 2012

Column H – AEO5_02_12 this is the DOE AEO 2005 factor for projecting from 2002 to 2012

Column I – ST_02_12 this is the state-supplied factor for projecting from 2002 to 2012

Column J – GF_02_09 this is the final factor actually used for projecting from 2002 to 2012 (it is the state-supplied factor, if available; if no state-supplied factor, then it is the AEO2005 factor; if no AEO2005 factor, then it is the default EGAS 5.0 factor)

Column K – EGAS_02_18 this is the EGAS 5.0 factor for projecting from 2002 to 2018

Column J – AEO5_02_18 this is the DOE AEO 2005 factor for projecting from 2002 to 2018

Column M– ST_02_18 this is the state-supplied factor for projecting from 2002 to 2018

Column N – GF_02_09 this is the final factor actually used for projecting from 2002 to 2012 (it is the state-supplied factor, if available; if no state-supplied factor, then it is the AEO2005 factor; if no AEO2005 factor, then it is the default EGAS 5.0 factor)

Column O – SCC description

Appendix B – NonEGU Point Source Control Factors

Table B-1 NonEGU Emission Units Affected by the NOx SIP Call Phase I

FIPS	SITE ID	Facility Name	EU ID	Ozone Season Allowance (tpy)	Prorated Annual Emissions (tpy)	Unit Description
09003	1509	PRATT & WHITNEY DIV UTC	P0049	11	26	FT-8 COGENERATION GAS TURBINE
09011	0604	PFIZER INC	P0001	33	79	BLR B&W FM140-97 #8
09011	0604	PFIZER INC	R0012	31	74	BLR CE #5 (101-4)
09011	3102	SPRAGUE PAPERBOARD INC	R0003	75	180	BLR B&W PFI-22-0 #1
24001	001-0011	WESTVACO FINE PAPERS	1	500	1200	001-0011-3-0018
24001	001-0011	WESTVACO FINE PAPERS	2	440	1056	001-0011-3-0019
25009	1190138	GENERAL ELECTRIC AIRCRAFT	03	29	68	BOILER #3-BABCOCK+WILCOX PPL-2897 DUAL FUEL EV99-3
25009	1190138	GENERAL ELECTRIC AIRCRAFT	05	24	58	TURBINE #1-GE G5301 DUAL FUEL BLDG 99-8
25017	1191844	MIT	02	132	317	TURBINE #1-ABB GT10 DUEL FUEL(EXHAUST TO HRSG)
25025	1190507	TRIGEN BOSTON ENERGY	01	47	113	BOILER #1-BABCOCK+WILCOX HSB8477A DUAL FUEL
25025	1190507	TRIGEN BOSTON ENERGY	02	47	113	BOILER #2-BABCOCK+WILCOX JSB8477B DUAL FUEL
25025	1190507	TRIGEN BOSTON ENERGY	03	47	113	BOILER #3-FOSTER+WHEELER SC DUAL FUEL
25025	1190507	TRIGEN BOSTON ENERGY	04	47	113	BOILER #4-BABCOCK+WILCOX HSB8608A DUAL FUEL
36031	5154800008	INTERNATIONAL PAPER TICONDEROG	POWERH	227	545	EMISSION UNIT
36055	8261400205	KODAK PARK DIVISION	U00015	1721	4130	EMISSION UNIT
36091	5412600007	INTERNATIONAL PAPER HUDSON RIV	UBOILR	124	298	EMISSION UNIT
42003	4200300022	SHENANGO INC.	005	13	31	BOILER #9, NATURAL GAS
42017	420170306	EXELON GENERATION CO/FAIRLESS	043	2	5	POWER HOUSE BOILER NO. 3

FIPS	SITE ID	Facility Name	EU ID	Ozone Season Allowance (tpy)	Prorated Annual Emissions (tpy)	Unit Description
42017	420170306	EXELON GENERATION CO/FAIRLESS	044	73	175	POWER HOUSE BOILER NO. 4
42017	420170306	EXELON GENERATION CO/FAIRLESS	045	61	146	POWER HOUSE BOILER NO. 5
42045	420450016	KIMBERLY CLARK PA LLC/CHESTER	034	2	5	
42045	420450220	FPL ENERGY MH50 LP/MARCUS HOOK	031	82	197	COGENERATION UNIT - ABB TYPE B
42047	420470005	WEYERHAEUSER/JOHNSONBURG MILL	040	85	204	BOILER #81
42047	420470005	WEYERHAEUSER/JOHNSONBURG MILL	041	86	206	BOILER #82
42091	420910028	MERCK & CO/WEST POINT	039	101	242	COGEN II GAS TURBINE
42101	4210101551	SUNOCO CHEMICALS (FORMER ALLIE	052	86	206	BL-703: BOILER #3
42131	421310009	PROCTER & GAMBLE PAPER PROD CO	035	203	482	WESTINGHOUSE 251B12
42133	421330016	PH GLATFELTER CO/SPRING GROVE	034	146	350	#4 POWER BOILER

Table B-2 Cement Kilns Affected by the NOx SIP Call Phase I

FIPS	SITE ID	Facility Name	EU ID	Control Factor	Unit Description
24013	013-0012	LEHIGH PORTLAND CEMENT	39	25.00	013-0012-6-0256 013-0012-6-0256
24021	021-0013	ESSROC CEMENT	21	25.00	021-0013-6-0465 021-0013-6-0465
24021	021-0013	ESSROC CEMENT	22	25.00	021-0013-6-0466 021-0013-6-0466
24043	043-0008	INDEPENDENT CEMENT/ST. LAWEREN	24	25.00	043-0008-6-0495 043-0008-6-0495
36001	4012400001	LAFARGE BUILDING MATERIALS INC	041000	25.00	EMISSION UNIT
36039	4192600021	ST LAWRENCE CEMENT CORP-CATSKI	U00K18	25.00	EMISSION UNIT
36113	5520500013	GLENS FALLS LEHIGH CEMENT	0UKILN	25.00	EMISSION UNIT
42011	420110039	LEHIGH CEMENT CO /EVANSVILLE	121	70.00	PORTLAND CEMENT KILN #1
42011	420110039	LEHIGH CEMENT CO /EVANSVILLE	122	70.00	PORTLAND CEMENT KILN #2
42019	420190024	ARMSTRONG CEMENT & SUPPLY	101	16.00	NO.1 KILN
42019	420190024	ARMSTRONG CEMENT & SUPPLY	121	16.00	NO.2 KILN
42073	420730024	CEMEX INC/WAMPUM CEMENT PLT	226	12.50	
42073	420730024	CEMEX INC/WAMPUM CEMENT PLT	227	0.00	
42073	420730024	CEMEX INC/WAMPUM CEMENT PLT	228	12.70	
42073	420730026	ESSROC/BESSEMER	501	8.00	
42073	420730026	ESSROC/BESSEMER	502	8.00	
42077	420770019	LAFARGE CORP/WHITEHALL PLT	101	12.28	K-2 KILN
42077	420770019	LAFARGE CORP/WHITEHALL PLT	114	100.00	K-3 KILN
42095	420950006	HERCULES CEMENT CO LP/STOCKERT	102	6.88	NO. 1 CEMENT KILN
42095	420950006	HERCULES CEMENT CO LP/STOCKERT	122	6.88	NO. 3 CEMENT KILN
42095	420950012	KEYSTONE PORTLAND CEMENT/EAST	101	27.00	CEMENT KILN NO. 1
42095	420950012	KEYSTONE PORTLAND CEMENT/EAST	102	27.00	CEMENT KILN NO. 2
42095	420950045	ESSROC/NAZARETH LOWER CEMENT	142	41.00	
42095	420950045	ESSROC/NAZARETH LOWER CEMENT	143	41.00	
42095	420950127	ESSROC/NAZARETH CEMENT PLT 3	101	41.00	
42095	420950127	ESSROC/NAZARETH CEMENT PLT 3	102	41.00	
42095	420950127	ESSROC/NAZARETH CEMENT PLT 3	103	41.00	
42095	420950127	ESSROC/NAZARETH CEMENT PLT 3	104	41.00	
42133	421330060	LEHIGH CEMENT CO/YORK OPERATION	200	27.00	

Table B-3 Large IC Engines Affected by the NOx SIP Call Phase II

FIPS	SITE ID	Facility Name	EU ID	Control Factor	Unit Description
24027	027-0223	TRANSCONTINENTAL GAS PIPE LINE	1	80.00	027-0223-5-0054 boiler
42005	420050015	DOMINION TRANS INC/SOUTH BEND	101	80.00	ENGINE #1 (2000 BHP)
42005	420050015	DOMINION TRANS INC/SOUTH BEND	102	80.00	ENGINE #2 (2000 BHP)
42005	420050015	DOMINION TRANS INC/SOUTH BEND	103	80.00	ENGINE #3 (2000 BHP)
42005	420050015	DOMINION TRANS INC/SOUTH BEND	104	80.00	ENGINE #4 (2000 BHP)
42005	420050015	DOMINION TRANS INC/SOUTH BEND	105	80.00	ENGINE #5 (2000 BHP)
42005	420050015	DOMINION TRANS INC/SOUTH BEND	106	80.00	ENGINE #6 (2000 BHP)
42029	420290047	TRANSCONTINENTAL GAS/FRAZER ST	741	80.00	#11 I-C GAS COMPRESSOR ENGINE
42029	420290047	TRANSCONTINENTAL GAS/FRAZER ST	742	80.00	#12 I-C GAS COMPRESSOR ENGINE
42029	420290047	TRANSCONTINENTAL GAS/FRAZER ST	743	80.00	#13 I-C GAS COMPRESSOR ENGINE
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	101	90.00	COOPER-BESSEMER ENGINE #1
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	101	90.00	COOPER-BESSEMER ENGINE #1
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	101	90.00	COOPER-BESSEMER ENGINE #1
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	101	90.00	COOPER-BESSEMER ENGINE #1
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	102	90.00	COOPER-BESSEMER ENGINE #2
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	102	90.00	COOPER-BESSEMER ENGINE #2
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	102	90.00	COOPER-BESSEMER ENGINE #2
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	102	90.00	COOPER-BESSEMER ENGINE #2
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	103	90.00	COOPER-BESSEMER ENGINE #3
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	103	90.00	COOPER-BESSEMER ENGINE #3
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	103	90.00	COOPER-BESSEMER ENGINE #3
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	103	90.00	COOPER-BESSEMER ENGINE #3
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	104	90.00	COOPER-BESSEMER ENGINE #4
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	104	90.00	COOPER-BESSEMER ENGINE #4
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	104	90.00	COOPER-BESSEMER ENGINE #4
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	104	90.00	COOPER-BESSEMER ENGINE #4
42105	421050005	TENNESSEE GAS PIPELINE CO/313	P111	80.00	3,000HP KVT-512 ENGINE
42105	421050005	TENNESSEE GAS PIPELINE CO/313	P112	80.00	2,000HP GMVH-10C ENGINE
42133	421330053	TRANSCONTINENTAL GAS/STATION 1	036	80.00	COOPER-BESSEMER ENGINE #4
42133	421330053	TRANSCONTINENTAL GAS/STATION 1	037	80.00	COOPER-BESSEMER ENGINE #5

B-4 NonEGU Control Factors for Post-2002 MACT Categories

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
20100102	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20100202	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20100702	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20100802	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20100902	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200102	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200104	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200202	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200204	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200301	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200501	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200702	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200706	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200902	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20201001	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20201002	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20201012	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20201014	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20201602	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20201702	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20300101	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20300301	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
30400101	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400102	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400103	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400104	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400105	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400106	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400107	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400108	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400109	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400110	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400111	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400112	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400113	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400114	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400115	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400116	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400117	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400118	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400120	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400121	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400130	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400131	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400132	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400133	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400150	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400160	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400199	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30500301	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30500302	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500303	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500304	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500305	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500306	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500307	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500308	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500309	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500310	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500311	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500312	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500313	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500314	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500315	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500316	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500317	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500318	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500319	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500321	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500322	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500330	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500331	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500332	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500333	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500334	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500335	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500340	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500342	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500350	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500351	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500355	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500360	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500361	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500370	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500397	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500398	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500399	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30501601	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501602	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501603	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501604	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501605	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501606	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501607	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501608	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501609	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501610	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501611	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501612	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501613	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501614	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501615	PM10-PRI	28.000	AAAAA	Lime Manufacturing

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30501616	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501617	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501618	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501619	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501620	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501621	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501622	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501623	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501624	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501625	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501626	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501627	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501628	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501629	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501630	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501631	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501632	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501633	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501640	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501650	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501660	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501699	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30400101	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400102	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400103	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400104	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400105	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400106	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400107	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400108	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400109	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400110	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400111	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400112	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400113	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400114	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400115	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400116	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400117	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400118	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400120	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400121	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400130	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400131	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400132	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400133	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400150	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400160	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400199	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30500301	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500302	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500303	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30500304	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500305	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500306	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500307	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500308	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500309	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500310	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500311	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500312	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500313	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500314	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500315	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500316	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500317	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500318	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500319	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500321	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500322	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500330	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500331	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500332	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500333	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500334	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500335	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500340	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500342	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500350	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500351	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500355	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500360	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500361	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500370	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500397	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500398	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500399	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30501601	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501602	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501603	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501604	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501605	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501606	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501607	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501608	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501609	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501610	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501611	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501612	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501613	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501614	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501615	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501616	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501617	PM25-PRI	28.000	AAAAA	Lime Manufacturing

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30501618	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501619	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501620	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501621	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501622	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501623	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501624	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501625	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501626	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501627	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501628	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501629	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501630	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501631	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501632	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501633	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501640	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501650	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501660	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501699	PM25-PRI	28.000	AAAAA	Lime Manufacturing
20100101	VOC	0.250	YYYY	Stationary Combustion Turbines
20100102	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20100201	VOC	0.250	YYYY	Stationary Combustion Turbines
20100202	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20100702	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20100802	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20100902	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200101	VOC	0.250	YYYY	Stationary Combustion Turbines
20200102	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200103	VOC	0.250	YYYY	Stationary Combustion Turbines
20200104	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200201	VOC	0.250	YYYY	Stationary Combustion Turbines
20200202	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200203	VOC	0.250	YYYY	Stationary Combustion Turbines
20200204	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200209	VOC	0.250	YYYY	Stationary Combustion Turbines
20200301	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200501	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200702	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200706	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200902	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20201001	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20201002	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20201012	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20201014	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20201602	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20201702	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20300101	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20300102	VOC	0.250	YYYY	Stationary Combustion Turbines
20300109	VOC	0.250	YYYY	Stationary Combustion Turbines
20300202	VOC	0.250	YYYY	Stationary Combustion Turbines
20300203	VOC	0.250	YYYY	Stationary Combustion Turbines

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
20300209	VOC	0.250	YYYY	Stationary Combustion Turbines
20300301	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20300701	VOC	0.250	YYYY	Stationary Combustion Turbines
30100501	VOC	26.100	YY	Generic MACT (Carbon Black)
30100502	VOC	26.100	YY	Generic MACT (Carbon Black)
30100503	VOC	26.100	YY	Generic MACT (Carbon Black)
30100504	VOC	26.100	YY	Generic MACT (Carbon Black)
30100506	VOC	26.100	YY	Generic MACT (Carbon Black)
30100507	VOC	26.100	YY	Generic MACT (Carbon Black)
30100508	VOC	26.100	YY	Generic MACT (Carbon Black)
30100509	VOC	26.100	YY	Generic MACT (Carbon Black)
30100510	VOC	26.100	YY	Generic MACT (Carbon Black)
30100599	VOC	26.100	YY	Generic MACT (Carbon Black)
30101005	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101012	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101013	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101014	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101015	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101021	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101022	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101023	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101026	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101027	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101028	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101033	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101034	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101035	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101036	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101037	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101040	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101045	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101046	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101047	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101050	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101051	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101052	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101053	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101054	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101055	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101061	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101062	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101063	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101064	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101073	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101074	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101075	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101076	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101077	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30101080	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101085	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101086	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101087	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101099	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101827	VOC	55.700	OOO	Polymers and Resins III
30101837	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101880	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101881	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101882	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101883	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101884	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101885	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101890	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101891	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101892	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101893	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101894	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101899	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30103201	VOC	87.400	UUU	Petroleum Refineries
30103202	VOC	87.400	UUU	Petroleum Refineries
30103203	VOC	87.400	UUU	Petroleum Refineries
30103204	VOC	87.400	UUU	Petroleum Refineries
30103205	VOC	87.400	UUU	Petroleum Refineries
30103299	VOC	87.400	UUU	Petroleum Refineries
30103301	VOC	64.820	MMM	Pesticide Active Ingredient
30103311	VOC	64.820	MMM	Pesticide Active Ingredient
30103312	VOC	64.820	MMM	Pesticide Active Ingredient
30103399	VOC	64.820	MMM	Pesticide Active Ingredient
30103901	VOC	44.500	YY	Generic MACT (Cyanide)
30103902	VOC	44.500	YY	Generic MACT (Cyanide)
30103903	VOC	44.500	YY	Generic MACT (Cyanide)
30105001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105101	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105105	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105108	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105110	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105112	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105114	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105116	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105118	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105120	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105122	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105124	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105130	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30110002	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30110003	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30110004	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30110005	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30110080	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30110099	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30111103	VOC	43.900	QQQQQ	Friction Products Manufacturing

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30111199	VOC	43.900	QQQQQ	Friction Products Manufacturing
30113001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30113003	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30113004	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30113005	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30113006	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30113007	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30201901	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201902	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201903	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201904	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201905	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201906	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201907	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201908	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201909	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201911	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201912	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201913	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201914	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201915	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201916	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201917	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201918	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201919	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201920	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201921	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201923	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201925	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201926	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201927	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201930	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201931	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201932	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201933	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201935	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201939	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201941	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201942	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201945	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201949	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201950	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201960	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201997	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201998	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201999	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30203404	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203405	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203406	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203407	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203410	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203415	VOC	12.500	CCCC	Manufacturing Nutritional Yeast

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30203420	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203421	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203422	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203423	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203424	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203504	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203505	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203506	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203507	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203510	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203530	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203531	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203532	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203533	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203534	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203535	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203536	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203540	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30300303	VOC	50.000	CCCCC	Coke Ovens: Pushing, Quenching, Battery St
30300304	VOC	50.000	CCCCC	Coke Ovens: Pushing, Quenching, Battery St
30400301	VOC	40.000	EEEEE	Iron and Steel Foundries
30400302	VOC	40.000	EEEEE	Iron and Steel Foundries
30400303	VOC	40.000	EEEEE	Iron and Steel Foundries
30400304	VOC	40.000	EEEEE	Iron and Steel Foundries
30400305	VOC	40.000	EEEEE	Iron and Steel Foundries
30400310	VOC	40.000	EEEEE	Iron and Steel Foundries
30400314	VOC	40.000	EEEEE	Iron and Steel Foundries
30400315	VOC	40.000	EEEEE	Iron and Steel Foundries
30400316	VOC	40.000	EEEEE	Iron and Steel Foundries
30400317	VOC	40.000	EEEEE	Iron and Steel Foundries
30400318	VOC	40.000	EEEEE	Iron and Steel Foundries
30400319	VOC	40.000	EEEEE	Iron and Steel Foundries
30400320	VOC	40.000	EEEEE	Iron and Steel Foundries
30400321	VOC	40.000	EEEEE	Iron and Steel Foundries
30400322	VOC	40.000	EEEEE	Iron and Steel Foundries
30400325	VOC	40.000	EEEEE	Iron and Steel Foundries
30400330	VOC	40.000	EEEEE	Iron and Steel Foundries
30400331	VOC	40.000	EEEEE	Iron and Steel Foundries
30400332	VOC	40.000	EEEEE	Iron and Steel Foundries
30400333	VOC	40.000	EEEEE	Iron and Steel Foundries
30400340	VOC	40.000	EEEEE	Iron and Steel Foundries
30400341	VOC	40.000	EEEEE	Iron and Steel Foundries
30400342	VOC	40.000	EEEEE	Iron and Steel Foundries
30400350	VOC	40.000	EEEEE	Iron and Steel Foundries
30400351	VOC	40.000	EEEEE	Iron and Steel Foundries
30400352	VOC	40.000	EEEEE	Iron and Steel Foundries
30400353	VOC	40.000	EEEEE	Iron and Steel Foundries
30400354	VOC	40.000	EEEEE	Iron and Steel Foundries
30400355	VOC	40.000	EEEEE	Iron and Steel Foundries
30400356	VOC	40.000	EEEEE	Iron and Steel Foundries
30400357	VOC	40.000	EEEEE	Iron and Steel Foundries
30400358	VOC	40.000	EEEEE	Iron and Steel Foundries

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30400360	VOC	40.000	EEEEE	Iron and Steel Foundries
30400370	VOC	40.000	EEEEE	Iron and Steel Foundries
30400371	VOC	40.000	EEEEE	Iron and Steel Foundries
30400398	VOC	40.000	EEEEE	Iron and Steel Foundries
30400399	VOC	40.000	EEEEE	Iron and Steel Foundries
30500101	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500102	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500103	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500104	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500105	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500106	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500107	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500108	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500110	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500111	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500112	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500113	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500114	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500115	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500116	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500117	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500118	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500119	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500120	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500121	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500130	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500131	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500132	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500133	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500134	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500135	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500140	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500141	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500142	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500143	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500144	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500145	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500146	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500147	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500150	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500151	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500152	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500153	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500154	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500198	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500199	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30501201	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501202	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501203	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501204	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501205	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501206	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30501207	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501208	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501209	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501211	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501212	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501213	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501214	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501215	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501221	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501222	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501223	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501224	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501299	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30600201	VOC	87.400	UUU	Petroleum Refineries (FCC)
30600202	VOC	87.400	UUU	Petroleum Refineries (FCC)
30600301	VOC	87.400	UUU	Petroleum Refineries (FCC)
30600402	VOC	87.400	UUU	Petroleum Refineries (FCC)
30600901	VOC	65.630	UUU	Petroleum Refineries
30600902	VOC	65.630	UUU	Petroleum Refineries
30600903	VOC	65.630	UUU	Petroleum Refineries
30600904	VOC	65.630	UUU	Petroleum Refineries
30600905	VOC	65.630	UUU	Petroleum Refineries
30600906	VOC	65.630	UUU	Petroleum Refineries
30600999	VOC	65.630	UUU	Petroleum Refineries
30601001	VOC	65.630	UUU	Petroleum Refineries
30601101	VOC	65.630	UUU	Petroleum Refineries
30601201	VOC	65.630	UUU	Petroleum Refineries
30601301	VOC	65.630	UUU	Petroleum Refineries
30601401	VOC	65.630	UUU	Petroleum Refineries
30609901	VOC	65.630	UUU	Petroleum Refineries
30609902	VOC	65.630	UUU	Petroleum Refineries
30609903	VOC	65.630	UUU	Petroleum Refineries
30609904	VOC	65.630	UUU	Petroleum Refineries
30609905	VOC	65.630	UUU	Petroleum Refineries
30610001	VOC	65.630	UUU	Petroleum Refineries
30688801	VOC	87.400	UUU	Petroleum Refineries
30688802	VOC	87.400	UUU	Petroleum Refineries
30688803	VOC	87.400	UUU	Petroleum Refineries
30688804	VOC	87.400	UUU	Petroleum Refineries
30688805	VOC	87.400	UUU	Petroleum Refineries
30700103	VOC	7.020	MM	Comustion Sources at Kraft, Soda, and Sulf
30700104	VOC	7.020	MM	Comustion Sources at Kraft, Soda, and Sulf
30700106	VOC	7.020	MM	Comustion Sources at Kraft, Soda, and Sulf
30700110	VOC	7.020	MM	Comustion Sources at Kraft, Soda, and Sulf
30700602	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700604	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700606	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700607	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700608	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700610	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700611	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700621	VOC	41.200	DDDD	Plywood and Composite Wood Products

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30700625	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700626	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700628	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700629	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700630	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700631	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700632	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700635	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700640	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700651	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700655	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700661	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700701	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700702	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700703	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700704	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700705	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700706	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700707	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700708	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700709	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700710	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700711	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700712	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700713	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700714	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700715	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700716	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700717	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700718	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700720	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700725	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700727	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700730	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700734	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700735	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700736	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700737	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700740	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700744	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700746	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700747	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700750	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700752	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700753	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700756	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700757	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700760	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700762	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700763	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700766	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700767	VOC	41.200	DDDD	Plywood and Composite Wood Products

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30700769	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700770	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700771	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700780	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700781	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700783	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700785	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700788	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700789	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700790	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700791	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700792	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700793	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700798	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700799	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700921	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700923	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700925	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700927	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700931	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700932	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700933	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700934	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700935	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700936	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700937	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700939	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700940	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700950	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700960	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700971	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700980	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700981	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700982	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700983	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700984	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701001	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701008	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701009	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701010	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701015	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701020	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701030	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701040	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701053	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701054	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701055	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701057	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701199	VOC	82.050	JJJJ	Paper and Other Web Coating
30800101	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800102	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800103	VOC	47.600	XXXX	Rubber Tire Manufacturing

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30800104	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800105	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800106	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800107	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800108	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800109	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800110	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800111	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800112	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800113	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800114	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800115	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800116	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800117	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800120	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800121	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800122	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800123	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800124	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800125	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800126	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800127	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800128	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800129	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800130	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800131	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800132	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800133	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800197	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800198	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800199	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800701	VOC	70.000	WWWW	Reinforced Plastics
30800702	VOC	70.000	WWWW	Reinforced Plastics
30800703	VOC	70.000	WWWW	Reinforced Plastics
30800704	VOC	70.000	WWWW	Reinforced Plastics
30800705	VOC	70.000	WWWW	Reinforced Plastics
30800720	VOC	70.000	WWWW	Reinforced Plastics
30800721	VOC	70.000	WWWW	Reinforced Plastics
30800722	VOC	70.000	WWWW	Reinforced Plastics
30800723	VOC	70.000	WWWW	Reinforced Plastics
30800724	VOC	70.000	WWWW	Reinforced Plastics
30800799	VOC	70.000	WWWW	Reinforced Plastics
30801001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
31401001	VOC	43.900	QQQQQ	Friction Products Manufacturing
31401002	VOC	43.900	QQQQQ	Friction Products Manufacturing
31401501	VOC	35.790	VVVV	Boat Manufacturing
31401503	VOC	35.790	VVVV	Boat Manufacturing
31401504	VOC	35.790	VVVV	Boat Manufacturing
31401510	VOC	35.790	VVVV	Boat Manufacturing
31401511	VOC	35.790	VVVV	Boat Manufacturing
31401512	VOC	35.790	VVVV	Boat Manufacturing
31401513	VOC	35.790	VVVV	Boat Manufacturing

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
31401514	VOC	35.790	VVVV	Boat Manufacturing
31401515	VOC	35.790	VVVV	Boat Manufacturing
31401516	VOC	35.790	VVVV	Boat Manufacturing
31401517	VOC	35.790	VVVV	Boat Manufacturing
31401518	VOC	35.790	VVVV	Boat Manufacturing
31401525	VOC	35.790	VVVV	Boat Manufacturing
31401530	VOC	35.790	VVVV	Boat Manufacturing
31401531	VOC	35.790	VVVV	Boat Manufacturing
31401540	VOC	35.790	VVVV	Boat Manufacturing
31401541	VOC	35.790	VVVV	Boat Manufacturing
31401550	VOC	35.790	VVVV	Boat Manufacturing
31401551	VOC	35.790	VVVV	Boat Manufacturing
31401552	VOC	35.790	VVVV	Boat Manufacturing
31401553	VOC	35.790	VVVV	Boat Manufacturing
31401560	VOC	35.790	VVVV	Boat Manufacturing
31401561	VOC	35.790	VVVV	Boat Manufacturing
31401562	VOC	35.790	VVVV	Boat Manufacturing
31401563	VOC	35.790	VVVV	Boat Manufacturing
31401570	VOC	35.790	VVVV	Boat Manufacturing
31401571	VOC	35.790	VVVV	Boat Manufacturing
31604001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
31604002	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
31604003	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
32099997	VOC	38.900	TTTT	Leather Finishing Operations
32099998	VOC	38.900	TTTT	Leather Finishing Operations
32099999	VOC	38.900	TTTT	Leather Finishing Operations
40201101	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201103	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201104	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201105	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201111	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201112	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201113	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201114	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201115	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201116	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201121	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201122	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201197	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201198	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201199	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201201	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201210	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201301	VOC	82.050	JJJJ	Paper and Other Web Coating
40201303	VOC	82.050	JJJJ	Paper and Other Web Coating
40201304	VOC	82.050	JJJJ	Paper and Other Web Coating
40201305	VOC	82.050	JJJJ	Paper and Other Web Coating
40201310	VOC	82.050	JJJJ	Paper and Other Web Coating
40201320	VOC	82.050	JJJJ	Paper and Other Web Coating
40201330	VOC	82.050	JJJJ	Paper and Other Web Coating
40201399	VOC	82.050	JJJJ	Paper and Other Web Coating
40201601	VOC	66.730	IIII	Auto and Light Trucks Surface Coating

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
40201602	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201603	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201604	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201605	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201606	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201607	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201608	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201609	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201619	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201620	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201621	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201622	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201623	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201624	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201625	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201626	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201627	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201628	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201629	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201630	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201631	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201632	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201699	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201702	VOC	70.830	KKKK	Metal Can
40201703	VOC	70.830	KKKK	Metal Can
40201704	VOC	70.830	KKKK	Metal Can
40201705	VOC	70.830	KKKK	Metal Can
40201706	VOC	70.830	KKKK	Metal Can
40201721	VOC	70.830	KKKK	Metal Can
40201722	VOC	70.830	KKKK	Metal Can
40201723	VOC	70.830	KKKK	Metal Can
40201724	VOC	70.830	KKKK	Metal Can
40201725	VOC	70.830	KKKK	Metal Can
40201726	VOC	70.830	KKKK	Metal Can
40201727	VOC	70.830	KKKK	Metal Can
40201728	VOC	70.830	KKKK	Metal Can
40201729	VOC	70.830	KKKK	Metal Can
40201731	VOC	70.830	KKKK	Metal Can
40201732	VOC	70.830	KKKK	Metal Can
40201733	VOC	70.830	KKKK	Metal Can
40201734	VOC	70.830	KKKK	Metal Can
40201735	VOC	70.830	KKKK	Metal Can
40201736	VOC	70.830	KKKK	Metal Can
40201737	VOC	70.830	KKKK	Metal Can
40201738	VOC	70.830	KKKK	Metal Can
40201739	VOC	70.830	KKKK	Metal Can
40201799	VOC	70.830	KKKK	Metal Can
40201801	VOC	53.060	SSSS	Metal Coil
40201802	VOC	53.060	SSSS	Metal Coil
40201803	VOC	53.060	SSSS	Metal Coil
40201804	VOC	53.060	SSSS	Metal Coil
40201805	VOC	53.060	SSSS	Metal Coil

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
40201806	VOC	53.060	SSSS	Metal Coil
40201807	VOC	53.060	SSSS	Metal Coil
40201899	VOC	53.060	SSSS	Metal Coil
40202001	VOC	73.070	RRRR	Metal Furniture
40202002	VOC	73.070	RRRR	Metal Furniture
40202003	VOC	73.070	RRRR	Metal Furniture
40202004	VOC	73.070	RRRR	Metal Furniture
40202005	VOC	73.070	RRRR	Metal Furniture
40202010	VOC	73.070	RRRR	Metal Furniture
40202011	VOC	73.070	RRRR	Metal Furniture
40202012	VOC	73.070	RRRR	Metal Furniture
40202013	VOC	73.070	RRRR	Metal Furniture
40202014	VOC	73.070	RRRR	Metal Furniture
40202015	VOC	73.070	RRRR	Metal Furniture
40202020	VOC	73.070	RRRR	Metal Furniture
40202021	VOC	73.070	RRRR	Metal Furniture
40202022	VOC	73.070	RRRR	Metal Furniture
40202023	VOC	73.070	RRRR	Metal Furniture
40202024	VOC	73.070	RRRR	Metal Furniture
40202025	VOC	73.070	RRRR	Metal Furniture
40202031	VOC	73.070	RRRR	Metal Furniture
40202032	VOC	73.070	RRRR	Metal Furniture
40202033	VOC	73.070	RRRR	Metal Furniture
40202034	VOC	73.070	RRRR	Metal Furniture
40202035	VOC	73.070	RRRR	Metal Furniture
40202036	VOC	73.070	RRRR	Metal Furniture
40202037	VOC	73.070	RRRR	Metal Furniture
40202038	VOC	73.070	RRRR	Metal Furniture
40202039	VOC	73.070	RRRR	Metal Furniture
40202099	VOC	73.070	RRRR	Metal Furniture
40202101	VOC	74.000	QQQQ	Wood Building Products
40202103	VOC	74.000	QQQQ	Wood Building Products
40202104	VOC	74.000	QQQQ	Wood Building Products
40202105	VOC	74.000	QQQQ	Wood Building Products
40202106	VOC	74.000	QQQQ	Wood Building Products
40202107	VOC	74.000	QQQQ	Wood Building Products
40202108	VOC	74.000	QQQQ	Wood Building Products
40202109	VOC	74.000	QQQQ	Wood Building Products
40202110	VOC	74.000	QQQQ	Wood Building Products
40202111	VOC	74.000	QQQQ	Wood Building Products
40202117	VOC	74.000	QQQQ	Wood Building Products
40202118	VOC	74.000	QQQQ	Wood Building Products
40202131	VOC	74.000	QQQQ	Wood Building Products
40202132	VOC	74.000	QQQQ	Wood Building Products
40202133	VOC	74.000	QQQQ	Wood Building Products
40202140	VOC	74.000	QQQQ	Wood Building Products
40202199	VOC	74.000	QQQQ	Wood Building Products
40202201	VOC	77.000	PPPP	Plastic Parts Coating
40202202	VOC	77.000	PPPP	Plastic Parts Coating
40202203	VOC	77.000	PPPP	Plastic Parts Coating
40202204	VOC	77.000	PPPP	Plastic Parts Coating
40202205	VOC	77.000	PPPP	Plastic Parts Coating

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
40202206	VOC	77.000	PPPP	Plastic Parts Coating
40202207	VOC	77.000	PPPP	Plastic Parts Coating
40202208	VOC	77.000	PPPP	Plastic Parts Coating
40202209	VOC	77.000	PPPP	Plastic Parts Coating
40202210	VOC	77.000	PPPP	Plastic Parts Coating
40202211	VOC	77.000	PPPP	Plastic Parts Coating
40202212	VOC	77.000	PPPP	Plastic Parts Coating
40202213	VOC	77.000	PPPP	Plastic Parts Coating
40202214	VOC	77.000	PPPP	Plastic Parts Coating
40202215	VOC	77.000	PPPP	Plastic Parts Coating
40202220	VOC	77.000	PPPP	Plastic Parts Coating
40202229	VOC	77.000	PPPP	Plastic Parts Coating
40202230	VOC	77.000	PPPP	Plastic Parts Coating
40202239	VOC	77.000	PPPP	Plastic Parts Coating
40202240	VOC	77.000	PPPP	Plastic Parts Coating
40202249	VOC	77.000	PPPP	Plastic Parts Coating
40202250	VOC	77.000	PPPP	Plastic Parts Coating
40202259	VOC	77.000	PPPP	Plastic Parts Coating
40202270	VOC	77.000	PPPP	Plastic Parts Coating
40202280	VOC	77.000	PPPP	Plastic Parts Coating
40202299	VOC	77.000	PPPP	Plastic Parts Coating
40202501	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202502	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202503	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202504	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202505	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202510	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202511	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202512	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202515	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202520	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202521	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202522	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202523	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202524	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202525	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202531	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202532	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202533	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202534	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202535	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202536	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202537	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202542	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202543	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202544	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202545	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202546	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202599	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202601	VOC	66.200	HHHHH	Misc. Coating Manufacturing
40202602	VOC	66.200	HHHHH	Misc. Coating Manufacturing
40202603	VOC	66.200	HHHHH	Misc. Coating Manufacturing

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
40202604	VOC	66.200	HHHHH	Misc. Coating Manufacturing
40202605	VOC	66.200	HHHHH	Misc. Coating Manufacturing
40202606	VOC	66.200	HHHHH	Misc. Coating Manufacturing
40202607	VOC	66.200	HHHHH	Misc. Coating Manufacturing
40202699	VOC	66.200	HHHHH	Misc. Coating Manufacturing
40388801	VOC	65.630	UUU	Petroleum Refineries
40388802	VOC	65.630	UUU	Petroleum Refineries
40388803	VOC	65.630	UUU	Petroleum Refineries
40388804	VOC	65.630	UUU	Petroleum Refineries
40388805	VOC	65.630	UUU	Petroleum Refineries
40399999	VOC	65.630	UUU	Petroleum Refineries
50400101	VOC	50.080	GGGGG	Site Remediation
50400102	VOC	50.080	GGGGG	Site Remediation
50400103	VOC	50.080	GGGGG	Site Remediation
50400104	VOC	50.080	GGGGG	Site Remediation
50400150	VOC	50.080	GGGGG	Site Remediation
50400151	VOC	50.080	GGGGG	Site Remediation
50400201	VOC	50.080	GGGGG	Site Remediation
50400202	VOC	50.080	GGGGG	Site Remediation
50410001	VOC	50.080	GGGGG	Site Remediation
50410002	VOC	50.080	GGGGG	Site Remediation
50410003	VOC	50.080	GGGGG	Site Remediation
50410004	VOC	50.080	GGGGG	Site Remediation
50410005	VOC	50.080	GGGGG	Site Remediation
50410010	VOC	50.080	GGGGG	Site Remediation
50410020	VOC	50.080	GGGGG	Site Remediation
50410021	VOC	50.080	GGGGG	Site Remediation
50410022	VOC	50.080	GGGGG	Site Remediation
50410030	VOC	50.080	GGGGG	Site Remediation
50410040	VOC	50.080	GGGGG	Site Remediation
50410101	VOC	50.080	GGGGG	Site Remediation
50410110	VOC	50.080	GGGGG	Site Remediation
50410111	VOC	50.080	GGGGG	Site Remediation
50410112	VOC	50.080	GGGGG	Site Remediation
50410120	VOC	50.080	GGGGG	Site Remediation
50410121	VOC	50.080	GGGGG	Site Remediation
50410122	VOC	50.080	GGGGG	Site Remediation
50410123	VOC	50.080	GGGGG	Site Remediation
50410124	VOC	50.080	GGGGG	Site Remediation
50410210	VOC	50.080	GGGGG	Site Remediation
50410211	VOC	50.080	GGGGG	Site Remediation
50410212	VOC	50.080	GGGGG	Site Remediation
50410213	VOC	50.080	GGGGG	Site Remediation
50410214	VOC	50.080	GGGGG	Site Remediation
50410215	VOC	50.080	GGGGG	Site Remediation
50410216	VOC	50.080	GGGGG	Site Remediation
50410310	VOC	50.080	GGGGG	Site Remediation
50410311	VOC	50.080	GGGGG	Site Remediation
50410312	VOC	50.080	GGGGG	Site Remediation
50410313	VOC	50.080	GGGGG	Site Remediation
50410314	VOC	50.080	GGGGG	Site Remediation
50410321	VOC	50.080	GGGGG	Site Remediation

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
50410322	VOC	50.080	GGGGG	Site Remediation
50410405	VOC	50.080	GGGGG	Site Remediation
50410406	VOC	50.080	GGGGG	Site Remediation
50410407	VOC	50.080	GGGGG	Site Remediation
50410408	VOC	50.080	GGGGG	Site Remediation
50410409	VOC	50.080	GGGGG	Site Remediation
50410420	VOC	50.080	GGGGG	Site Remediation
50410510	VOC	50.080	GGGGG	Site Remediation
50410511	VOC	50.080	GGGGG	Site Remediation
50410512	VOC	50.080	GGGGG	Site Remediation
50410513	VOC	50.080	GGGGG	Site Remediation
50410514	VOC	50.080	GGGGG	Site Remediation
50410520	VOC	50.080	GGGGG	Site Remediation
50410521	VOC	50.080	GGGGG	Site Remediation
50410522	VOC	50.080	GGGGG	Site Remediation
50410523	VOC	50.080	GGGGG	Site Remediation
50410524	VOC	50.080	GGGGG	Site Remediation
50410525	VOC	50.080	GGGGG	Site Remediation
50410530	VOC	50.080	GGGGG	Site Remediation
50410531	VOC	50.080	GGGGG	Site Remediation
50410532	VOC	50.080	GGGGG	Site Remediation
50410533	VOC	50.080	GGGGG	Site Remediation
50410534	VOC	50.080	GGGGG	Site Remediation
50410535	VOC	50.080	GGGGG	Site Remediation
50410536	VOC	50.080	GGGGG	Site Remediation
50410537	VOC	50.080	GGGGG	Site Remediation
50410538	VOC	50.080	GGGGG	Site Remediation
50410539	VOC	50.080	GGGGG	Site Remediation
50410540	VOC	50.080	GGGGG	Site Remediation
50410541	VOC	50.080	GGGGG	Site Remediation
50410542	VOC	50.080	GGGGG	Site Remediation
50410543	VOC	50.080	GGGGG	Site Remediation
50410560	VOC	50.080	GGGGG	Site Remediation
50410561	VOC	50.080	GGGGG	Site Remediation
50410562	VOC	50.080	GGGGG	Site Remediation
50410563	VOC	50.080	GGGGG	Site Remediation
50410564	VOC	50.080	GGGGG	Site Remediation
50410565	VOC	50.080	GGGGG	Site Remediation
50410610	VOC	50.080	GGGGG	Site Remediation
50410620	VOC	50.080	GGGGG	Site Remediation
50410621	VOC	50.080	GGGGG	Site Remediation
50410622	VOC	50.080	GGGGG	Site Remediation
50410623	VOC	50.080	GGGGG	Site Remediation
50410640	VOC	50.080	GGGGG	Site Remediation
50410641	VOC	50.080	GGGGG	Site Remediation
50410642	VOC	50.080	GGGGG	Site Remediation
50410643	VOC	50.080	GGGGG	Site Remediation
50410644	VOC	50.080	GGGGG	Site Remediation
50410645	VOC	50.080	GGGGG	Site Remediation
50410710	VOC	50.080	GGGGG	Site Remediation
50410711	VOC	50.080	GGGGG	Site Remediation
50410712	VOC	50.080	GGGGG	Site Remediation

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
50410720	VOC	50.080	GGGGG	Site Remediation
50410721	VOC	50.080	GGGGG	Site Remediation
50410722	VOC	50.080	GGGGG	Site Remediation
50410723	VOC	50.080	GGGGG	Site Remediation
50410724	VOC	50.080	GGGGG	Site Remediation
50410725	VOC	50.080	GGGGG	Site Remediation
50410726	VOC	50.080	GGGGG	Site Remediation
50410740	VOC	50.080	GGGGG	Site Remediation
50410760	VOC	50.080	GGGGG	Site Remediation
50410761	VOC	50.080	GGGGG	Site Remediation
50410762	VOC	50.080	GGGGG	Site Remediation
50410763	VOC	50.080	GGGGG	Site Remediation
50410764	VOC	50.080	GGGGG	Site Remediation
50410765	VOC	50.080	GGGGG	Site Remediation
50410766	VOC	50.080	GGGGG	Site Remediation
50410780	VOC	50.080	GGGGG	Site Remediation
50480001	VOC	50.080	GGGGG	Site Remediation
50482001	VOC	50.080	GGGGG	Site Remediation
50482002	VOC	50.080	GGGGG	Site Remediation
50482599	VOC	50.080	GGGGG	Site Remediation
50490004	VOC	50.080	GGGGG	Site Remediation
62540001	VOC	62.900	UUUU	Cellulose Products
62540010	VOC	62.900	UUUU	Cellulose Products
62540020	VOC	62.900	UUUU	Cellulose Products
62540021	VOC	62.900	UUUU	Cellulose Products
62540022	VOC	62.900	UUUU	Cellulose Products
62540023	VOC	62.900	UUUU	Cellulose Products
62540024	VOC	62.900	UUUU	Cellulose Products
62540025	VOC	62.900	UUUU	Cellulose Products
62540030	VOC	62.900	UUUU	Cellulose Products
62540040	VOC	62.900	UUUU	Cellulose Products
62540041	VOC	62.900	UUUU	Cellulose Products
62540042	VOC	62.900	UUUU	Cellulose Products
62540050	VOC	62.900	UUUU	Cellulose Products
62580001	VOC	62.900	UUUU	Cellulose Products
62582001	VOC	62.900	UUUU	Cellulose Products
62582002	VOC	62.900	UUUU	Cellulose Products
62582501	VOC	62.900	UUUU	Cellulose Products
62582502	VOC	62.900	UUUU	Cellulose Products
62582503	VOC	62.900	UUUU	Cellulose Products
62582599	VOC	62.900	UUUU	Cellulose Products
64130001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130101	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130110	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130111	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130112	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130125	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130201	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130210	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
64130211	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130225	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64131001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64131010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64131011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64131015	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64131020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64131025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64131030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64132001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64132010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64132011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64132020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64132025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64132030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64133001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64133010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64133011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64133020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64133025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64133030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64180001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64182001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64182002	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64182599	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64420001	VOC	62.900	UUUU	Cellulose Products
64420010	VOC	62.900	UUUU	Cellulose Products
64420011	VOC	62.900	UUUU	Cellulose Products
64420012	VOC	62.900	UUUU	Cellulose Products
64420013	VOC	62.900	UUUU	Cellulose Products
64420014	VOC	62.900	UUUU	Cellulose Products
64420015	VOC	62.900	UUUU	Cellulose Products
64420016	VOC	62.900	UUUU	Cellulose Products
64420020	VOC	62.900	UUUU	Cellulose Products
64420021	VOC	62.900	UUUU	Cellulose Products
64420022	VOC	62.900	UUUU	Cellulose Products
64420030	VOC	62.900	UUUU	Cellulose Products
64420031	VOC	62.900	UUUU	Cellulose Products
64420032	VOC	62.900	UUUU	Cellulose Products
64420033	VOC	62.900	UUUU	Cellulose Products
64420034	VOC	62.900	UUUU	Cellulose Products
64420040	VOC	62.900	UUUU	Cellulose Products
64420041	VOC	62.900	UUUU	Cellulose Products
64420042	VOC	62.900	UUUU	Cellulose Products
64430001	VOC	62.900	UUUU	Cellulose Products
64430010	VOC	62.900	UUUU	Cellulose Products
64430011	VOC	62.900	UUUU	Cellulose Products
64430012	VOC	62.900	UUUU	Cellulose Products
64430013	VOC	62.900	UUUU	Cellulose Products
64430014	VOC	62.900	UUUU	Cellulose Products
64430015	VOC	62.900	UUUU	Cellulose Products
64430016	VOC	62.900	UUUU	Cellulose Products

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
64430017	VOC	62.900	UUUU	Cellulose Products
64430030	VOC	62.900	UUUU	Cellulose Products
64431001	VOC	62.900	UUUU	Cellulose Products
64431010	VOC	62.900	UUUU	Cellulose Products
64431011	VOC	62.900	UUUU	Cellulose Products
64431012	VOC	62.900	UUUU	Cellulose Products
64431013	VOC	62.900	UUUU	Cellulose Products
64431014	VOC	62.900	UUUU	Cellulose Products
64431015	VOC	62.900	UUUU	Cellulose Products
64431016	VOC	62.900	UUUU	Cellulose Products
64431017	VOC	62.900	UUUU	Cellulose Products
64431030	VOC	62.900	UUUU	Cellulose Products
64450001	VOC	62.900	UUUU	Cellulose Products
64450010	VOC	62.900	UUUU	Cellulose Products
64450011	VOC	62.900	UUUU	Cellulose Products
64450012	VOC	62.900	UUUU	Cellulose Products
64450013	VOC	62.900	UUUU	Cellulose Products
64450014	VOC	62.900	UUUU	Cellulose Products
64450020	VOC	62.900	UUUU	Cellulose Products
64450021	VOC	62.900	UUUU	Cellulose Products
64450022	VOC	62.900	UUUU	Cellulose Products
64450030	VOC	62.900	UUUU	Cellulose Products
64450031	VOC	62.900	UUUU	Cellulose Products
64450032	VOC	62.900	UUUU	Cellulose Products
64450033	VOC	62.900	UUUU	Cellulose Products
64450034	VOC	62.900	UUUU	Cellulose Products
64450035	VOC	62.900	UUUU	Cellulose Products
64450036	VOC	62.900	UUUU	Cellulose Products
64450040	VOC	62.900	UUUU	Cellulose Products
64450041	VOC	62.900	UUUU	Cellulose Products
64450042	VOC	62.900	UUUU	Cellulose Products
64450050	VOC	62.900	UUUU	Cellulose Products
64450051	VOC	62.900	UUUU	Cellulose Products
64450052	VOC	62.900	UUUU	Cellulose Products
64450053	VOC	62.900	UUUU	Cellulose Products
64450060	VOC	62.900	UUUU	Cellulose Products
64450061	VOC	62.900	UUUU	Cellulose Products
64450062	VOC	62.900	UUUU	Cellulose Products
64520001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520021	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520022	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520023	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520031	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520032	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520040	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520041	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
64521011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521021	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521022	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521023	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521040	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521041	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610012	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610021	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610022	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610031	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610032	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610040	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610041	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610050	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610101	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610110	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610111	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610112	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610120	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610121	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610122	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610130	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610131	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610132	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610140	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610141	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610142	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610143	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610150	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610201	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610210	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610211	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610212	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610220	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610221	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610222	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610230	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610231	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610232	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610240	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610241	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610242	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610250	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610301	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610310	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610311	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
64610312	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610320	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610321	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610322	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610330	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610331	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610332	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610340	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610350	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615012	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615021	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615022	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615023	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620012	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620013	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620015	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620016	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620017	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620018	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620021	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620022	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620026	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620027	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620031	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620032	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620033	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620034	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620035	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620036	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620037	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620038	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630012	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630015	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630016	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630026	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630035	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630040	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
64630041	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630042	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630050	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630051	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630052	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630053	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630080	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630081	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630082	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630083	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631012	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631015	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631016	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631026	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631040	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631050	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631051	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631052	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631053	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631080	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631081	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631082	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631083	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632015	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632016	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632040	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632041	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632042	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632050	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632051	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632052	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632053	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632080	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632081	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632082	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632083	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64680001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64682001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64682002	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64682501	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64682502	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64682599	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
64820010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64821001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64821010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64822001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64822010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64823001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64823010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64824001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64824010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64880001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64882001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64882002	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64882599	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64920001	VOC	62.900	UUUU	Cellulose Products
64920010	VOC	62.900	UUUU	Cellulose Products
64920011	VOC	62.900	UUUU	Cellulose Products
64920012	VOC	62.900	UUUU	Cellulose Products
64920013	VOC	62.900	UUUU	Cellulose Products
64920020	VOC	62.900	UUUU	Cellulose Products
64920021	VOC	62.900	UUUU	Cellulose Products
64920022	VOC	62.900	UUUU	Cellulose Products
64920030	VOC	62.900	UUUU	Cellulose Products
64920031	VOC	62.900	UUUU	Cellulose Products
64920032	VOC	62.900	UUUU	Cellulose Products
64920033	VOC	62.900	UUUU	Cellulose Products
64920034	VOC	62.900	UUUU	Cellulose Products
64930001	VOC	62.900	UUUU	Cellulose Products
64930010	VOC	62.900	UUUU	Cellulose Products
64930011	VOC	62.900	UUUU	Cellulose Products
64930012	VOC	62.900	UUUU	Cellulose Products
64930020	VOC	62.900	UUUU	Cellulose Products
64930021	VOC	62.900	UUUU	Cellulose Products
64930030	VOC	62.900	UUUU	Cellulose Products
64930031	VOC	62.900	UUUU	Cellulose Products
64930035	VOC	62.900	UUUU	Cellulose Products
64930040	VOC	62.900	UUUU	Cellulose Products
64930041	VOC	62.900	UUUU	Cellulose Products
64930045	VOC	62.900	UUUU	Cellulose Products
64930050	VOC	62.900	UUUU	Cellulose Products
64931001	VOC	62.900	UUUU	Cellulose Products
64931010	VOC	62.900	UUUU	Cellulose Products
64931011	VOC	62.900	UUUU	Cellulose Products
64931012	VOC	62.900	UUUU	Cellulose Products
64931020	VOC	62.900	UUUU	Cellulose Products
64931021	VOC	62.900	UUUU	Cellulose Products
64931022	VOC	62.900	UUUU	Cellulose Products
64931030	VOC	62.900	UUUU	Cellulose Products
64931031	VOC	62.900	UUUU	Cellulose Products
64931032	VOC	62.900	UUUU	Cellulose Products
64931040	VOC	62.900	UUUU	Cellulose Products
64931041	VOC	62.900	UUUU	Cellulose Products
64931050	VOC	62.900	UUUU	Cellulose Products

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
64980001	VOC	62.900	UUUU	Cellulose Products
64982001	VOC	62.900	UUUU	Cellulose Products
64982002	VOC	62.900	UUUU	Cellulose Products
64982599	VOC	62.900	UUUU	Cellulose Products
65135001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
65140001	VOC	44.500	YY	Generic MACT (Cyanide)
65140010	VOC	44.500	YY	Generic MACT (Cyanide)
65140011	VOC	44.500	YY	Generic MACT (Cyanide)
65140012	VOC	44.500	YY	Generic MACT (Cyanide)
65140013	VOC	44.500	YY	Generic MACT (Cyanide)
65140014	VOC	44.500	YY	Generic MACT (Cyanide)
65140015	VOC	44.500	YY	Generic MACT (Cyanide)
65140016	VOC	44.500	YY	Generic MACT (Cyanide)
65140017	VOC	44.500	YY	Generic MACT (Cyanide)
65140018	VOC	44.500	YY	Generic MACT (Cyanide)
65140030	VOC	44.500	YY	Generic MACT (Cyanide)
68430001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68430010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68430011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68430020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68430030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68430031	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68430032	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68445001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68445010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68445013	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68445020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68445022	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68445101	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68445201	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68510001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68510010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68510011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68580001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68582001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68582002	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68582599	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc

Table B-5 NonEGU Source Shutdowns

FIPS	SITE ID	FACILTY NAME	EU ID	UNIT DESCRIPTION
10003	1000300021	SUNCO INC R M	001	BOILER #1
10003	1000300021	SUNCO INC R M	002	BOILER #2
10003	1000300021	SUNCO INC R M	003	BOILER #3
10003	1000300016	MOTIVA ENTERPRISES LLC	072	METHANOL PLT HTR 41-H-1
10003	1000300004	WILMINGTON PIECE DYE CO	ALL	ALL
10003	1000300032	GENERAL CHEMICAL CORPORATION	ALL	ALL
10003	1000300074	METACHEM PRODUCTS LLC	ALL	ALL
10003	1000300127	VPI FILM LLC	ALL	ALL
10003	1000300129	LAFARGE NORTH AMERICA INC	ALL	ALL
10003	1000300350	KANEKA DELAWARE CORPORATION	ALL	ALL
25001	1200202	PARTYLITE WORLDWIDE	ALL	ALL
25001	1200614	BOURNE LANDFILL	ALL	ALL
25003	1170002	ADVANCED INFORMATION	ALL	ALL
25003	1170005	CATAMOUNT PELLET FUE	ALL	ALL
25003	1170048	SPRAGUE NORTH ADAMS	ALL	ALL
25003	1170056	BERKSHIRE GAS STOCKB	ALL	ALL
25003	1170078	MACDERMID GRAPHIC AR	ALL	ALL
25003	1170091	LANE CONSTRUCTION CO	ALL	ALL
25005	1200009	TEXAS INSTRUMENTS	ALL	ALL
25005	1200031	CONDEA VISTA CO	ALL	ALL
25005	1200036	ELKAY REVERE CORP	ALL	ALL
25005	1200037	AEROVOX INCORPORATED	ALL	ALL
25005	1200065	ROSEMAR SILVER COMPA	ALL	ALL
25005	1200080	ATTLEBORO REFINING C	ALL	ALL
25005	1200116	STEDRO TEXTILES	ALL	ALL
25005	1200138	CLIFTEX CORPORATION	ALL	ALL
25005	1200169	PAUL DEVER STATE SCH	ALL	ALL
25005	1200209	PHARMACY SERVICE COR	ALL	ALL
25005	1200216	BRISTOL COUNTY JAIL	ALL	ALL
25005	1200235	SEA WATCH INTERNATIO	ALL	ALL
25005	1200393	OLSONS GREENHOUSES	ALL	ALL
25005	1200468	AA WILL MATERIALS-FR	ALL	ALL
25005	1200498	CRAPO HILL LANDFILL	ALL	ALL
25005	1200510	KREW INCORPORATED	ALL	ALL
25005	1200513	AEROVOX INCORPORATED	ALL	ALL
25005	1200542	LALLY COLUMN CORP	ALL	ALL
25005	1200673	HOMELAND BUILDERS	ALL	ALL
25005	1200824	JUSTIN CLOTHING CO	ALL	ALL
25005	1200880	VELVET DRIVE TRANSMI	ALL	ALL

FIPS	SITE ID	FACILTY NAME	EU ID	UNIT DESCRIPTION
25005	1192308	INTERSTATE MAT & RUB	ALL	ALL
25009	1210057	COASTAL METAL FINISH	ALL	ALL
25009	1210058	AMESBURY CHAIR	ALL	ALL
25009	1210075	HAMPSHIRE FABRICS	ALL	ALL
25009	1210099	WASTE MANAGEMENT HUN	ALL	ALL
25009	1210110	CUSTOM INDUSTRIES IN	ALL	ALL
25009	1210114	SAGAMORE INDUSTRIAL	ALL	ALL
25009	1210143	LABELS INC	ALL	ALL
25009	1210154	NEWARK ATLANTIC PAPE	ALL	ALL
25009	1210208	TEK COATING COMPANY	ALL	ALL
25009	1210209	NATIONAL NORTHEAST	ALL	ALL
25009	1210223	STARENSIER INC	ALL	ALL
25009	1210400	SANMINA CORPORATION	ALL	ALL
25009	1210401	COVANTA HAVERHILL IN	ALL	ALL
25009	1210404	TEKE FURNITURE RESTO	ALL	ALL
25009	1190756	PERMAIR LEATHERS INC	ALL	ALL
25009	1190842	SLB SNACKS INC	ALL	ALL
25009	1190983	SALEM OIL & GREASE C	ALL	ALL
25009	1191036	JCR ELECTRONICS	ALL	ALL
25009	1195900	LEPAGES INC	ALL	ALL
25013	0420008	DELUXE FINANCIAL	ALL	ALL
25013	0420010	FRYE COPYSYSTEMS INC	ALL	ALL
25013	0420013	JAHN FOUNDRY CORPORA	ALL	ALL
25013	0420052	APW/WRIGHT LINE	ALL	ALL
25013	0420130	KODAK POLYCHROME GRA	ALL	ALL
25013	0420175	FIBERMARK DSI	ALL	ALL
25013	0420218	SPRINGFIELD PRINTING	ALL	ALL
25013	0420252	KODAK POLYCHROME GRA	ALL	ALL
25013	0420528	NATIONAL METAL INDUS	ALL	ALL
25015	0420060	BERKSHIRE GAS HATFIE	ALL	ALL
25015	0420105	INDUSTRIAL POWER SER	ALL	ALL
25015	0420170	TECHALLOY COMPANY IN	ALL	ALL
25015	0420424	MAGNAT MACHINETECH I	ALL	ALL
25015	0420463	INDUSTRIAL PROP OF E	ALL	ALL
25015	0420540	GENERAL CABLE CORP	ALL	ALL
25015	0420614	REXAM IMAGE PRODUCTS	ALL	ALL
25017	1210013	MERRIMACK MAGNETICS	ALL	ALL
25017	1210050	MAJILITE MFG INC	ALL	ALL
25017	1210064	FINISH UNLIMITED INC	ALL	ALL
25017	1190080	MASS BROKEN STONE CO	ALL	ALL
25017	1210127	USM CORPORATION	ALL	ALL

FIPS	SITE ID	FACILTY NAME	EU ID	UNIT DESCRIPTION
25017	1210147	UMASS LOWELL-RESIDEN	ALL	ALL
25017	1210182	JOAN FABRICS CORP	ALL	ALL
25017	1190203	SC WAKEFIELD 200	ALL	ALL
25017	1190212	OLYMPUS SPECIALTY HO	ALL	ALL
25017	1190258	ROYAL INSTITUTIONAL	ALL	ALL
25017	1210334	T&T INDUSTRIAL	ALL	ALL
25017	1190465	PRINTED CIRCUIT CORP	ALL	ALL
25017	1190611	GEORGE MEADE FOUNDRY	ALL	ALL
25017	1190734	NEW ENGLAND CONFECTI	ALL	ALL
25017	1180794	SCHOTT CML FIBEROPTI	ALL	ALL
25017	1190984	SUNGARD AVAILABILITY	ALL	ALL
25017	1191008	RAYTHEON SYSTEMS CO	ALL	ALL
25017	1191217	BOSTON SCIENTIFIC CO	ALL	ALL
25017	1191267	AGFA DIVISION OF BAY	ALL	ALL
25017	1191351	MIT EDUCATIONAL FACI	ALL	ALL
25017	1191389	LONGVIEW FIBRE COMPA	ALL	ALL
25017	1191534	SWISSTRONICS INCORPO	ALL	ALL
25017	1191653	FOCAL INCORPORATED	ALL	ALL
25017	1191668	LEE PRODUCTS COMPANY	ALL	ALL
25017	1191735	TYCO ELECTRONICS COR	ALL	ALL
25017	1191897	GENZYME CORPORATION	ALL	ALL
25017	1194001	WF WOOD INC	ALL	ALL
25017	1194010	RR DONNELLEY & SONS	ALL	ALL
25017	1214012	PERFORMANCE CORRUGAT	ALL	ALL
25021	1190246	SOUTHWOOD COMMUNITY	ALL	ALL
25021	1190313	INNOVATIVE MEMBRANE	ALL	ALL
25021	1180359	BEVILACQUA PAVING CO	ALL	ALL
25021	1200515	FOXBOROUGH REALTY AS	ALL	ALL
25021	1200616	PLAINVILLE GENERATIN	ALL	ALL
25021	1190670	RAYTHEON ELECTRONIC	ALL	ALL
25021	1190714	TEVA PHARMACEUTICAL	ALL	ALL
25021	1190962	NIDEC AMERICA CORPOR	ALL	ALL
25021	1191562	BARCLAY HOUSE THE	ALL	ALL
25021	1191726	MWRA QUINCY PS	ALL	ALL
25021	1192130	CURRY WOODWORKING IN	ALL	ALL
25021	1199000	MEDFIELD STATE HOSPI	ALL	ALL
25023	1200637	FRANKLIN FIXTURES IN	ALL	ALL
25023	1200698	CRANBERRY GRAPHICS I	ALL	ALL
25023	1192101	GTR FINISHING CORPOR	ALL	ALL
25023	1192109	ALGER CORPORATION TH	ALL	ALL
25023	1192210	IMPERIA CORPORATION	ALL	ALL

FIPS	SITE ID	FACILTY NAME	EU ID	UNIT DESCRIPTION
25023	1199994	TEST-RADIUS-FITZGERA	ALL	ALL
25025	1190035	BOSTON WATER & SEWER	ALL	ALL
25025	1190057	NEPONSET RIVER VALLE	ALL	ALL
25025	1190101	UNIFIRST CORP	ALL	ALL
25025	1190357	DAMRELL EWER PARTNER	ALL	ALL
25025	1190478	WINTHROP COMMUNITY H	ALL	ALL
25025	1190649	ZAPCO READVILLE COGE	ALL	ALL
25025	1190808	PUBLIC HEALTH COMMUN	ALL	ALL
25025	1191551	BEACON CAPITAL PARTN	ALL	ALL
25025	1191566	NEW ENGLAND TRAWLER	ALL	ALL
25025	1191621	FEDERAL MOGUL FRICTI	ALL	ALL
25025	1191662	EQUITY OFFICE	ALL	ALL
25025	1191956	CHANNEL CENTER:PARCE	ALL	ALL
25025	1195596	SYNTHON IND INCORPOR	ALL	ALL
25027	1180010	CANTERBURY TOWERS	ALL	ALL
25027	1180014	ER BUCK CHAIR COMPAN	ALL	ALL
25027	1180029	GENERAL ELECTRIC FIT	ALL	ALL
25027	1180091	ANGLO FABRICS COMPAN	ALL	ALL
25027	1180100	ZAPCO ENERGY TACTICS	ALL	ALL
25027	1180111	CINCINATTI MILACRON	ALL	ALL
25027	1180114	NEW ENGLAND PLATING	ALL	ALL
25027	1180129	GF WRIGHT STEEL & WI	ALL	ALL
25027	1180132	STANDARDFOUNDRY	ALL	ALL
25027	1180174	WORCESTER TOOL & STA	ALL	ALL
25027	1180203	WORCESTER COUNTY HOS	ALL	ALL
25027	1180244	HI TECH METALS & FIN	ALL	ALL
25027	1180340	GHM INDUSTRIES INC	ALL	ALL
25027	1180353	ADVANCED MICROSENSOR	ALL	ALL
25027	1180355	NEWARK AMERICA	ALL	ALL
25027	1180373	ZYGO TERAOPTIX	ALL	ALL
25027	1180389	ETHAN ALLEN-DUDLEY	ALL	ALL
25027	1180439	INLAND PAPERBOARD &	ALL	ALL
25027	1180484	NELMOR COMPANY	ALL	ALL
25027	1180518	JAMESBURY INCORPORAT	ALL	ALL
25027	1180556	M&H TIRE CO INC	ALL	ALL
25027	1180568	CROFT CORPORATION	ALL	ALL
25027	1180796	LINCOLN PLAZA CENTER	ALL	ALL
25027	1180994	COZ PLASTICS INC	ALL	ALL
25027	1181045	WORCESTER TAPER PIN	ALL	ALL
33011	3301100093	BATESVILLE MANUFACTURING	ALL	ALL
33015	3301500058	VENTURE SEABROOK	ALL	ALL

Appendix C – Area Source Growth Factors

Table C-1 Area Source Growth Factors by SCC Code

See Electronic File: MANE-VU_Area_gf_scc.xls

This table contains records with area source growth factors by county and SCC. The format for the tables is as follows:

Column A – County FIPS code

Column B – Source Classification Code (SCC)

Column C – EGAS_02_09 this is the EGAS 5.0 factor for projecting from 2002 to 2009

Column D – AEO5_02_09 this is the DOE AEO 2005 factor for projecting from 2002 to 2009

Column E – ST_02_09 this is the state-supplied factor for projecting from 2002 to 2009

Column F – GF_02_09 this is the final factor actually used for projecting from 2002 to 2009 (it is the state-supplied factor, if available; if no state-supplied factor, then it is the AEO2005 factor; if no AEO2005 factor, then it is the default EGAS 5.0 factor)

Column G – EGAS_02_12 this is the EGAS 5.0 factor for projecting from 2002 to 2012

Column H – AEO5_02_12 this is the DOE AEO 2005 factor for projecting from 2002 to 2012

Column I – ST_02_12 this is the state-supplied factor for projecting from 2002 to 2012

Column J – GF_02_09 this is the final factor actually used for projecting from 2002 to 2012 (it is the state-supplied factor, if available; if no state-supplied factor, then it is the AEO2005 factor; if no AEO2005 factor, then it is the default EGAS 5.0 factor)

Column K – EGAS_02_18 this is the EGAS 5.0 factor for projecting from 2002 to 2018

Column J – AEO5_02_18 this is the DOE AEO 2005 factor for projecting from 2002 to 2018

Column M– ST_02_18 this is the state-supplied factor for projecting from 2002 to 2018

Column N – GF_02_09 this is the final factor actually used for projecting from 2002 to 2012 (it is the state-supplied factor, if available; if no state-supplied factor, then it is the AEO2005 factor; if no AEO2005 factor, then it is the default EGAS 5.0 factor)

Column O – SCC description

Appendix D – Area Source Control Factors

Table D-1 Area Source Control Factors for 2001 OTC VOC Model Rules

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
AIM Coatings						
09	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
09	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
10	2401002000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings - Solvent-based;Surface Coating
10	2401003000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings - Water-based;Surface Coating
10	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
10	2401102000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings- Solve;Surface Coating
10	2401103000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings- Water;Surface Coating
11	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
11	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
11	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating
11	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
23	2401001000	VOC	29.50	29.50	29.50	Total: All Solvent Types;Architectural Coatings;Surface Coating
23	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
23	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating
23	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
24	2401002000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings - Solvent-based;Surface Coating
24	2401003000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings - Water-based;Surface Coating
24	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
24	2401008999	VOC	31.00	31.00	31.00	Solvents: NEC;Traffic Markings;Surface Coating
24	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating
24	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
25	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
25	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
25	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
25	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
33	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
33	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
33	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating
33	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
34	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
34	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
34	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating
34	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
36	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
36	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
42	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
42	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
42	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating
42	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
44	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
44	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
50	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
50	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
50	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating
50	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
Consumer Products						
09	2465000000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Products/Processes;Miscellaneous Non-industrial: Consumer
10	2460100000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Personal Care Products;Miscellaneous Non-industrial: Consumer and Commerc
10	2460200000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Household Products;Miscellaneous Non-industrial: Consumer and Commerc

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
10	2460400000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Automotive Aftermarket Products;Miscellaneous Non-industrial: Consumer and Commerc
10	2460500000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Coatings and Related Products;Miscellaneous Non-industrial: Consumer and Commerc
10	2460600000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Adhesives and Sealants;Miscellaneous Non-industrial: Consumer and Commerc
10	2460800000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All FIFRA Related Products;Miscellaneous Non-industrial: Consumer and Commerc
10	2460900000	VOC	14.20	14.20	14.20	Total: All Solvent Types;Miscellaneous Products (Not Otherwise Covered);Miscellaneous Non-industrial: Consumer and Commerc
11	2460100000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Personal Care Products;Miscellaneous Non-industrial: Consumer and Commerc
11	2460200000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Household Products;Miscellaneous Non-industrial: Consumer and Commerc
11	2460400000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Automotive Aftermarket Products;Miscellaneous Non-industrial: Consumer and Commerc
11	2460500000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Coatings and Related Products;Miscellaneous Non-industrial: Consumer and Commerc
11	2460600000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Adhesives and Sealants;Miscellaneous Non-industrial: Consumer and Commerc
11	2460800000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All FIFRA Related Products;Miscellaneous Non-industrial: Consumer and Commerc
11	2460900000	VOC	14.20	14.20	14.20	Total: All Solvent Types;Miscellaneous Products (Not Otherwise Covered);Miscellaneous Non-industrial: Consumer and Commerc
23	2460100000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Personal Care Products;Miscellaneous Non-industrial: Consumer and Commerc
23	2460200000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Household Products;Miscellaneous Non-industrial: Consumer and Commerc
23	2460400000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Automotive Aftermarket Products;Miscellaneous Non-industrial: Consumer and Commerc
23	2460500000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Coatings and Related Products;Miscellaneous Non-industrial: Consumer and Commerc
23	2460600000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Adhesives and Sealants;Miscellaneous Non-industrial: Consumer and Commerc

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
23	2460800000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All FIFRA Related Products;Miscellaneous Non-industrial: Consumer and Commerc
23	2460900000	VOC	14.20	14.20	14.20	Total: All Solvent Types;Miscellaneous Products (Not Otherwise Covered);Miscellaneous Non-industrial: Consumer and Commerc
24	2465000000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Products/Processes;Miscellaneous Non-industrial: Consumer
25	2460000000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Processes;Miscellaneous Non-industrial: Consumer and Commerc
33	2460000000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Processes;Miscellaneous Non-industrial: Consumer and Commerc
34	2460100000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Personal Care Products;Miscellaneous Non-industrial: Consumer and Commerc
34	2460200000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Household Products;Miscellaneous Non-industrial: Consumer and Commerc
34	2460400000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Automotive Aftermarket Products;Miscellaneous Non-industrial: Consumer and Commerc
34	2460500000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Coatings and Related Products;Miscellaneous Non-industrial: Consumer and Commerc
34	2460600000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Adhesives and Sealants;Miscellaneous Non-industrial: Consumer and Commerc
34	2460800000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All FIFRA Related Products;Miscellaneous Non-industrial: Consumer and Commerc
34	2460900000	VOC	14.20	14.20	14.20	Total: All Solvent Types;Miscellaneous Products (Not Otherwise Covered);Miscellaneous Non-industrial: Consumer and Commerc
34	2465000000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Products/Processes;Miscellaneous Non-industrial: Consumer
36	2460000000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Processes;Miscellaneous Non-industrial: Consumer and Commerc
42	2465000000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Products/Processes;Miscellaneous Non-industrial: Consumer
44	2460100000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Personal Care Products;Miscellaneous Non-industrial: Consumer and Commerc
44	2460200000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Household Products;Miscellaneous Non-industrial: Consumer and Commerc
44	2460400000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Automotive Aftermarket Products;Miscellaneous Non-industrial: Consumer and Commerc

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
44	2460500000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Coatings and Related Products;Miscellaneous Non-industrial: Consumer and Commerc
44	2460600000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Adhesives and Sealants;Miscellaneous Non-industrial: Consumer and Commerc
44	2460800000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All FIFRA Related Products;Miscellaneous Non-industrial: Consumer and Commerc
44	2460900000	VOC	14.20	14.20	14.20	Total: All Solvent Types;Miscellaneous Products (Not Otherwise Covered);Miscellaneous Non-industrial: Consumer and Commerc
50	2460100000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Personal Care Products;Miscellaneous Non-industrial: Consumer and Commerc
50	2460200000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Household Products;Miscellaneous Non-industrial: Consumer and Commerc
50	2460400000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Automotive Aftermarket Products;Miscellaneous Non-industrial: Consumer and Commerc
50	2460500000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Coatings and Related Products;Miscellaneous Non-industrial: Consumer and Commerc
50	2460600000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Adhesives and Sealants;Miscellaneous Non-industrial: Consumer and Commerc
50	2460800000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All FIFRA Related Products;Miscellaneous Non-industrial: Consumer and Commerc
50	2460900000	VOC	14.20	14.20	14.20	Total: All Solvent Types;Miscellaneous Products (Not Otherwise Covered);Miscellaneous Non-industrial: Consumer and Commerc
Mobile Equipment Repair and Refinishing						
09	2401005000	VOC	38.00	38.00	38.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
10	2401005500	VOC	38.00	38.00	38.00	Surface Preparation Solvents;Auto Refinishing: SIC 7532;Surface Coating
10	2401005600	VOC	38.00	38.00	38.00	Primers;Auto Refinishing: SIC 7532;Surface Coating
10	2401005700	VOC	38.00	38.00	38.00	Top Coats;Auto Refinishing: SIC 7532;Surface Coating
10	2401005800	VOC	38.00	38.00	38.00	Clean-up Solvents;Auto Refinishing: SIC 7532;Surface Coating
11	2401005000	VOC	38.00	38.00	38.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
23	2401005000	VOC	38.00	38.00	38.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
24	2401005000	VOC	0.00	0.00	0.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
25	2401005000	VOC	0.00	0.00	0.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
33	2401005000	VOC	38.00	38.00	38.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
34	2401005000	VOC	19.00	19.00	19.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
36	2401005000	VOC	38.00	38.00	38.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
42	2401005000	VOC	0.00	0.00	0.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
44	2401005000	VOC	38.00	38.00	38.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
50	2401005000	VOC	38.00	38.00	38.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
Solvent Cleaning Operations						
09	2415000000	VOC	66.00	66.00	66.00	Total: All Solvent Types;All Processes/All Industries;Degreasing
23	2415000000	VOC	66.00	66.00	66.00	Total: All Solvent Types;All Processes/All Industries;Degreasing
23	2415030000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Electronic and Other Elec. (SIC 36): All Processes;Degreasing
23	2415045000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Miscellaneous Manufacturing (SIC 39): All Processe;Degreasing
23	2415065000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Auto Repair Services (SIC 75): All Processes;Degreasing
23	2415300000	VOC	66.00	66.00	66.00	Total: All Solvent Types;All Industries: Cold Cleaning;Degreasing
25	2415000000	VOC	7.00	7.00	7.00	Total: All Solvent Types;All Industries: Cold Cleaning;Degreasing
33	2415000000	VOC	66.00	66.00	66.00	Total: All Solvent Types;All Industries: Cold Cleaning;Degreasing
34	2415000000	VOC	17.00	17.00	17.00	Total: All Solvent Types;All Processes/All Industries;Degreasing
36	2415020000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Fabricated Metal Products (SIC 34): All Processes;Degreasing
36	2415025000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Industrial Machinery and Equipment (SIC 35): All P;Degreasing
36	2415035000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Transportation Equipment (SIC 37): All Processes;Degreasing
36	2415045000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Miscellaneous Manufacturing (SIC 39): All Processe;Degreasing
36	2415055000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Automotive Dealers (SIC 55): All Processes;Degreasing
36	2415060000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Miscellaneous Repair Services (SIC 76): All Proces;Degreasing
44	2415000000	VOC	66.00	66.00	66.00	Total: All Solvent Types;All Processes/All Industries;Degreasing

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
Portable Fuel Containers						
09	2501060300	VOC	41.3	63.8	75.0	Total;Portable Containers: Residential & Com;Petroleum and Petroleum Product Storage
10	2501011010	VOC	41.3	63.8	75.0	Vapor Losses;Portable Containers: Residential;Petroleum and Petroleum Product Storage
10	2501011011	VOC	41.3	63.8	75.0	Permeation;Portable Containers: Residential;Petroleum and Petroleum Product Storage
10	2501011012	VOC	41.3	63.8	75.0	Diurnal;Portable Containers: Residential;Petroleum and Petroleum Product Storage
10	2501011015	VOC	41.3	63.8	75.0	Spillage;Portable Containers: Residential;Petroleum and Petroleum Product Storage
10	2501011016	VOC	41.3	63.8	75.0	Transport;Portable Containers: Residential;Petroleum and Petroleum Product Storage
10	2501012010	VOC	41.3	63.8	75.0	Vapor Losses;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
10	2501012011	VOC	41.3	63.8	75.0	Permeation;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
10	2501012012	VOC	41.3	63.8	75.0	Diurnal;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
10	2501012015	VOC	41.3	63.8	75.0	Spillage;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
10	2501012016	VOC	41.3	63.8	75.0	Transport;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
11	2501011011	VOC	41.3	63.8	75.0	Permeation;Portable Containers: Residential;Petroleum and Petroleum Product Storage
11	2501011012	VOC	41.3	63.8	75.0	Diurnal;Portable Containers: Residential;Petroleum and Petroleum Product Storage
11	2501011016	VOC	41.3	63.8	75.0	Transport;Portable Containers: Residential;Petroleum and Petroleum Product Storage
11	2501012011	VOC	41.3	63.8	75.0	Permeation;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
11	2501012012	VOC	41.3	63.8	75.0	Diurnal;Portable Containers: Commercial;Petroleum and Petroleum Product

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
						Storage
11	2501012016	VOC	41.3	63.8	75.0	Transport;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
23	2501060300	VOC	41.3	63.8	75.0	Total;Portable Containers: Residential & Com;Petroleum and Petroleum Product Storage
24	2501011011	VOC	48.8	71.3	75.0	Permeation;Portable Containers: Residential;Petroleum and Petroleum Product Storage
24	2501011012	VOC	48.8	71.3	75.0	Diurnal;Portable Containers: Residential;Petroleum and Petroleum Product Storage
24	2501011016	VOC	48.8	71.3	75.0	Transport;Portable Containers: Residential;Petroleum and Petroleum Product Storage
24	2501012011	VOC	48.8	71.3	75.0	Permeation;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
24	2501012012	VOC	48.8	71.3	75.0	Diurnal;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
24	2501012016	VOC	48.8	71.3	75.0	Transport;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
25	2501011000	VOC	18.8	41.3	75.0	;;
25	2501012000	VOC	18.8	41.3	75.0	;;
33	2501060300	VOC	26.3	48.8	75.0	Total;Portable Containers: Residential & Com;Petroleum and Petroleum Product Storage
34	2501000120	VOC	33.8	56.3	75.0	Gasoline;All Storage Types: Breathing Loss;Petroleum and Petroleum Product Storage
36	2501011011	VOC	48.8	71.3	75.0	Permeation;Portable Containers: Residential;Petroleum and Petroleum Product Storage
36	2501011012	VOC	48.8	71.3	75.0	Diurnal;Portable Containers: Residential;Petroleum and Petroleum Product Storage
36	2501011016	VOC	48.8	71.3	75.0	Transport;Portable Containers: Residential;Petroleum and Petroleum Product Storage
36	2501012011	VOC	48.8	71.3	75.0	Permeation;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
36	2501012012	VOC	48.8	71.3	75.0	Diurnal;Portable Containers: Commercial;Petroleum and Petroleum Product Storage

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
36	2501012016	VOC	48.8	71.3	75.0	Transport;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
42	2501060300	VOC	48.8	71.3	75.0	Total;Portable Containers: Residential & Com;Petroleum and Petroleum Product Storage
44	2501060300	VOC	18.8	41.3	75.0	Total;Portable Containers: Residential & Com;Petroleum and Petroleum Product Storage
50	2501060300	VOC	18.8	41.3	75.0	Total;Portable Containers: Residential & Com;Petroleum and Petroleum Product Storage

Table D-2 Area Source Control Factors for On-Board Vapor Recovery

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
09001	2501060101	VOC	23.81	28.57	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09001	2501060102	VOC	23.81	28.57	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
09003	2501060101	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09003	2501060102	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
09005	2501060101	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09005	2501060102	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
09007	2501060101	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09007	2501060102	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
09009	2501060101	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09009	2501060102	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
09011	2501060101	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09011	2501060102	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
09013	2501060101	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09013	2501060102	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
09015	2501060101	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09015	2501060102	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
10001	2501060100	VOC	40.54	48.65	56.76	Stage 2: Total;Gasoline Service Stations
10003	2501060100	VOC	40.54	48.65	56.76	Stage 2: Total;Gasoline Service Stations
10005	2501060100	VOC	40.54	48.65	56.76	Stage 2: Total;Gasoline Service Stations
11001	2501060100	VOC	40.54	48.65	56.76	Stage 2: Total;Gasoline Service Stations
23001	2501060100	VOC	53.68	67.65	79.41	Stage 2: Total;Gasoline Service Stations
23003	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23005	2501060100	VOC	28.57	33.33	42.86	Stage 2: Total;Gasoline Service Stations
23007	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23009	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23011	2501060100	VOC	53.68	67.65	79.41	Stage 2: Total;Gasoline Service Stations
23013	2501060100	VOC	53.68	67.65	79.41	Stage 2: Total;Gasoline Service Stations
23015	2501060100	VOC	53.68	67.65	79.41	Stage 2: Total;Gasoline Service Stations
23017	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23019	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23021	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23023	2501060100	VOC	28.57	33.33	42.86	Stage 2: Total;Gasoline Service Stations
23025	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23027	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23029	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23031	2501060100	VOC	28.57	33.33	42.86	Stage 2: Total;Gasoline Service Stations
24001	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
24003	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24005	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24009	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24011	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24013	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24015	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24017	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24019	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24021	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24023	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24025	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24027	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24029	2501060100	VOC	53.53	68.24	80.00	Stage 2: Total;Gasoline Service Stations
24031	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24033	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24035	2501060100	VOC	53.53	68.24	80.00	Stage 2: Total;Gasoline Service Stations
24037	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24039	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24041	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24043	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24045	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24047	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24510	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
25001	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25003	2501060102	VOC	38.24	50.00	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25005	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25007	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25009	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25011	2501060102	VOC	38.24	50.00	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25013	2501060102	VOC	38.24	50.00	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25015	2501060102	VOC	38.24	50.00	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25017	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25019	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25021	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25023	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25025	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25027	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
33001	2501060100	VOC	53.75	68.13	80.00	Stage 2: Total;Gasoline Service Stations
33003	2501060100	VOC	53.75	68.13	80.00	Stage 2: Total;Gasoline Service Stations
33005	2501060100	VOC	53.75	68.13	80.00	Stage 2: Total;Gasoline Service Stations
33007	2501060100	VOC	53.75	68.13	80.00	Stage 2: Total;Gasoline Service Stations

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
33009	2501060100	VOC	53.75	68.13	80.00	Stage 2: Total;Gasoline Service Stations
33011	2501060100	VOC	38.24	50.00	55.88	Stage 2: Total;Gasoline Service Stations
33013	2501060100	VOC	38.24	50.00	55.88	Stage 2: Total;Gasoline Service Stations
33015	2501060100	VOC	38.24	50.00	55.88	Stage 2: Total;Gasoline Service Stations
33017	2501060100	VOC	38.24	50.00	55.88	Stage 2: Total;Gasoline Service Stations
33019	2501060100	VOC	53.75	68.13	80.00	Stage 2: Total;Gasoline Service Stations
34001	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34003	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34005	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34007	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34009	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34011	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34013	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34015	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34017	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34019	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34021	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34023	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34025	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34027	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34029	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34031	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34033	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34035	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34037	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34039	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34041	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
36001	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36003	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36005	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36007	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36009	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36011	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36013	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36015	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36017	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36019	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36021	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36023	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36025	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36027	2501060100	VOC	53.80	67.72	79.75	Stage 2: Total;Gasoline Service Stations
36029	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36031	2501060100	VOC	53.57	67.86	79.76	Stage 2: Total;Gasoline Service Stations
36033	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36035	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36037	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36039	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36041	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36043	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36045	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
36047	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36049	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36051	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36053	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36055	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36057	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36059	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36061	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36063	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36065	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36067	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36069	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36071	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36073	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36075	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36077	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36079	2501060100	VOC	53.80	67.72	79.75	Stage 2: Total;Gasoline Service Stations
36081	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36083	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36085	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36087	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36089	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36091	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36093	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36095	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36097	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36099	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36101	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36103	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36105	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36107	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36109	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36111	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36113	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36115	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36117	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36119	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36121	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36123	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
42001	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42003	2501060102	VOC	26.09	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42005	2501060102	VOC	26.09	34.78	39.13	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42007	2501060102	VOC	26.09	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42009	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42011	2501060101	VOC	26.09	34.78	39.13	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42013	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
						Stations
42015	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42017	2501060102	VOC	30.43	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42019	2501060102	VOC	26.09	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42021	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42023	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42025	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42027	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42029	2501060102	VOC	30.43	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42031	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42033	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42035	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42037	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42039	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42041	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42043	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42045	2501060102	VOC	30.43	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42047	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42049	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42051	2501060102	VOC	26.09	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42053	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42055	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42057	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42059	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42061	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42063	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42065	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42067	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42069	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42071	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42073	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
						Stations
42075	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42077	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42079	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42081	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42083	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42085	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42087	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42089	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42091	2501060102	VOC	30.43	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42093	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42095	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42097	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42099	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42101	2501060102	VOC	30.43	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42103	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42105	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42107	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42109	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42111	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42113	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42115	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42117	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42119	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42121	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42123	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42125	2501060102	VOC	26.09	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42127	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42129	2501060102	VOC	26.09	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42131	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42133	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
						Stations
44001	2501060000	VOC	38.24	50.00	55.88	Total: All Gasoline/All Processes;Gasoline Service Stations
44003	2501060000	VOC	38.24	50.00	55.88	Total: All Gasoline/All Processes;Gasoline Service Stations
44005	2501060000	VOC	38.24	50.00	55.88	Total: All Gasoline/All Processes;Gasoline Service Stations
44007	2501060000	VOC	38.24	50.00	55.88	Total: All Gasoline/All Processes;Gasoline Service Stations
44009	2501060000	VOC	38.24	50.00	55.88	Total: All Gasoline/All Processes;Gasoline Service Stations
50001	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50001	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50001	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50003	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50003	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50003	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50005	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50005	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50005	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50007	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50007	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50007	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50009	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50009	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50009	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50011	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50011	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50011	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50013	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50013	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50013	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50015	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50015	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50015	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50017	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50017	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50017	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50019	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50019	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50019	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50021	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
						Stations
50021	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50021	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50023	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50023	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50023	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50025	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50025	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50025	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50027	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50027	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50027	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations

Table D-3 Area Source Growth/Control Factors for Residential Wood Combustion

SCC	SCC Description	Assumptions	Growth and Control Factor		
			2002-2009	2002-2012	2002-2018
2104008000	Total: Woodstoves and Fireplaces	1 - 0.01056*(Year-2002) (Assumes 19.4% fireplaces 71.6%old woodstoves 9.1%new woodstoves)	0.926	0.894	0.831
2104008001	Fireplaces: General	Increase 1%/yr: 1 + 0.01*(Year-2002)	1.070	1.100	1.160
2104008002	Fireplaces: Insert; non-EPA certified	Decrease 2%/yr: 1 - 0.02*(Year-2002)	0.860	0.800	0.680
2104008003	Fireplaces: Insert; EPA certified; non-catalytic	Increase 2%/yr: 1 + 0.02*(Year-2002)	1.140	1.200	1.320
2104008004	Fireplaces: Insert; EPA certified; catalytic	Increase 2%/yr (same as 2104008003)	1.140	1.200	1.320
2104008010	Woodstoves: General	Decrease 2%/yr (same as 2104008002)	0.860	0.800	0.680
2104008030	Catalytic Woodstoves: General	Increase 2%/yr (same as 2104008003)	1.140	1.200	1.320
2104008050	Non-catalytic Woodstoves: EPA certified	Increase 2%/yr (same as 2104008003)	1.140	1.200	1.320
2104008051	Non-catalytic Woodstoves: Non-EPA certified	Decrease 2%/yr (same as 2104008002)	0.860	0.800	0.680
2104008052	Non-catalytic Woodstoves: Low Emitting	Increase 2%/yr (same as 2104008003)	1.140	1.200	1.320
2104008053	Non-catalytic Woodstoves: Pellet Fired	Increase 2%/yr (same as 2104008003)	1.140	1.200	1.320

Table E-1 NonEGU BOTW Control Factors for Adhesives and Sealants Application, Asphalt Production Plants, Cement Kilns, and Glass/Fiberglass Furnaces

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
Control Measure: Adhesives and Sealants Application								
09003	6484	R0131	01	40200701	VOC	64.40	64.40	64.40
09003	6484	R0132	01	40200701	VOC	64.40	64.40	64.40
09015	0647	P0085	01	40200701	VOC	64.40	64.40	64.40
10001	1000100004	003	2	40200701	VOC	64.40	64.40	64.40
10001	1000100004	005	2	40200701	VOC	64.40	64.40	64.40
10001	1000100004	005	3	40200701	VOC	64.40	64.40	64.40
10001	1000100004	005	4	40200701	VOC	64.40	64.40	64.40
10001	1000100004	005	5	40200701	VOC	64.40	64.40	64.40
10003	1000300365	002	2	40200706	VOC	64.40	64.40	64.40
10003	1000300365	002	1	40200710	VOC	64.40	64.40	64.40
23001	2300100076	003	2	40200701	VOC	64.40	64.40	64.40
24003	003-0250	232	01F232	40200701	VOC	64.40	64.40	64.40
24003	003-0250	232	01S232	40200701	VOC	64.40	64.40	64.40
24005	005-2407	17	01F17	40200701	VOC	64.40	64.40	64.40
24005	005-2407	17	01S17	40200701	VOC	64.40	64.40	64.40
24025	025-0006	45	01F45	40200710	VOC	64.40	64.40	64.40
24025	025-0006	45	01S45	40200710	VOC	64.40	64.40	64.40
24025	025-0423	5	01F5	40200701	VOC	64.40	64.40	64.40
24025	025-0423	5	01S5	40200701	VOC	64.40	64.40	64.40
24025	025-0423	6	01F6	40200701	VOC	64.40	64.40	64.40
24025	025-0423	6	01S6	40200701	VOC	64.40	64.40	64.40
24025	025-0423	7	01F7	40200701	VOC	64.40	64.40	64.40
24025	025-0423	7	01S7	40200701	VOC	64.40	64.40	64.40
24045	045-0082	12	01F12	40200710	VOC	64.40	64.40	64.40
24045	045-0082	12	01S12	40200710	VOC	64.40	64.40	64.40
25005	1200077	12	0108	40200701	VOC	64.40	64.40	64.40
25005	1200100	23	0111	40200701	VOC	64.40	64.40	64.40
25005	1200100	26	0114	40200701	VOC	64.40	64.40	64.40
25005	1200100	28	0116	40200701	VOC	64.40	64.40	64.40
25005	1200101	08	0107	40200701	VOC	64.40	64.40	64.40
25005	1200101	09	0108	40200706	VOC	64.40	64.40	64.40
25005	1200101	10	0109	40200701	VOC	64.40	64.40	64.40
25005	1200101	11	0110	40200701	VOC	64.40	64.40	64.40
25005	1200101	12	0111	40200701	VOC	64.40	64.40	64.40
25005	1200183	07	0203	40200701	VOC	64.40	64.40	64.40
25005	1200388	04	0104	40200701	VOC	64.40	64.40	64.40
25005	1200388	05	0105	40200701	VOC	64.40	64.40	64.40
25005	1200388	05	0205	40200701	VOC	64.40	64.40	64.40
25005	1200509	04	0104	40200701	VOC	64.40	64.40	64.40
25005	1200585	02	0102	40200710	VOC	64.40	64.40	64.40
25005	1200673	07	0107	40200710	VOC	64.40	64.40	64.40

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
25005	1200707	08	0106	40200710	VOC	64.40	64.40	64.40
25005	1200851	11	0110	40200710	VOC	64.40	64.40	64.40
25009	1190683	03	0103	40200706	VOC	64.40	64.40	64.40
25009	1190690	09	0108	40200710	VOC	64.40	64.40	64.40
25009	1210026	15	0115	40200710	VOC	64.40	64.40	64.40
25009	1210046	01	0101	40200706	VOC	64.40	64.40	64.40
25009	1210083	05	0104	40200710	VOC	64.40	64.40	64.40
25009	1210093	09	0209	40200701	VOC	64.40	64.40	64.40
25009	1210110	01	0101	40200701	VOC	64.40	64.40	64.40
25009	1210212	30	0321	40200706	VOC	64.40	64.40	64.40
25009	1210212	30	0721	40200706	VOC	64.40	64.40	64.40
25009	1210212	32	0322	40200706	VOC	64.40	64.40	64.40
25009	1210212	32	0622	40200706	VOC	64.40	64.40	64.40
25009	1210212	32	0922	40200706	VOC	64.40	64.40	64.40
25009	1210276	03	0102	40200701	VOC	64.40	64.40	64.40
25009	1210332	01	0101	40200701	VOC	64.40	64.40	64.40
25009	1210332	02	0102	40200701	VOC	64.40	64.40	64.40
25009	1210332	03	0103	40200701	VOC	64.40	64.40	64.40
25009	1210341	10	0110	40200710	VOC	64.40	64.40	64.40
25009	1211013	07	0105	40200710	VOC	64.40	64.40	64.40
25009	1211013	08	0306	40200710	VOC	64.40	64.40	64.40
25009	1211013	33	0331	40200701	VOC	64.40	64.40	64.40
25009	1211013	72	0259	40200710	VOC	64.40	64.40	64.40
25009	1211013	89	0253	40200710	VOC	64.40	64.40	64.40
25013	0420145	16	0112	40200710	VOC	64.40	64.40	64.40
25013	0420213	01	0201	40200701	VOC	64.40	64.40	64.40
25013	0420260	02	0102	40200710	VOC	64.40	64.40	64.40
25013	0420265	06	0105	40200701	VOC	64.40	64.40	64.40
25013	0420561	01	0101	40200701	VOC	64.40	64.40	64.40
25013	0420798	05	0105	40200710	VOC	64.40	64.40	64.40
25013	0420821	10	0106	40200701	VOC	64.40	64.40	64.40
25015	0420558	01	0101	40200710	VOC	64.40	64.40	64.40
25017	1180795	02	0102	40200706	VOC	64.40	64.40	64.40
25017	1180795	03	0103	40200706	VOC	64.40	64.40	64.40
25017	1180795	04	0104	40200706	VOC	64.40	64.40	64.40
25017	1180795	05	0105	40200706	VOC	64.40	64.40	64.40
25017	1180795	06	0106	40200706	VOC	64.40	64.40	64.40
25017	1180795	07	0107	40200701	VOC	64.40	64.40	64.40
25017	1180795	08	0108	40200701	VOC	64.40	64.40	64.40
25017	1180795	09	0109	40200701	VOC	64.40	64.40	64.40
25017	1190355	05	0101	40200706	VOC	64.40	64.40	64.40
25017	1190424	04	0104	40200701	VOC	64.40	64.40	64.40
25017	1190424	08	0106	40200701	VOC	64.40	64.40	64.40
25017	1190424	11	0107	40200701	VOC	64.40	64.40	64.40
25017	1190424	20	0110	40200701	VOC	64.40	64.40	64.40
25017	1190424	24	0111	40200701	VOC	64.40	64.40	64.40
25017	1190424	28	0112	40200701	VOC	64.40	64.40	64.40

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
25017	1190424	32	0213	40200701	VOC	64.40	64.40	64.40
25017	1190424	37	0117	40200701	VOC	64.40	64.40	64.40
25017	1190429	06	0106	40200710	VOC	64.40	64.40	64.40
25017	1190560	02	0101	40200710	VOC	64.40	64.40	64.40
25017	1190560	23	0106	40200710	VOC	64.40	64.40	64.40
25017	1190585	08	0104	40200706	VOC	64.40	64.40	64.40
25017	1190585	17	0106	40200710	VOC	64.40	64.40	64.40
25017	1190692	09	0107	40200701	VOC	64.40	64.40	64.40
25017	1190692	10	0108	40200701	VOC	64.40	64.40	64.40
25017	1190692	11	0108	40200701	VOC	64.40	64.40	64.40
25017	1190953	04	0104	40200710	VOC	64.40	64.40	64.40
25017	1190999	11	0111	40200710	VOC	64.40	64.40	64.40
25017	1190999	11	0211	40200710	VOC	64.40	64.40	64.40
25017	1190999	13	0313	40200710	VOC	64.40	64.40	64.40
25017	1191104	03	0103	40200710	VOC	64.40	64.40	64.40
25017	1191192	05	0104	40200701	VOC	64.40	64.40	64.40
25017	1191296	26	0116	40200701	VOC	64.40	64.40	64.40
25017	1191296	27	0117	40200701	VOC	64.40	64.40	64.40
25017	1191471	04	0103	40200710	VOC	64.40	64.40	64.40
25017	1191564	08	0108	40200710	VOC	64.40	64.40	64.40
25017	1191844	53	0135	40200710	VOC	64.40	64.40	64.40
25017	1191844	53	0335	40200710	VOC	64.40	64.40	64.40
25017	1192051	12	0107	40200710	VOC	64.40	64.40	64.40
25017	1192051	26	0115	40200710	VOC	64.40	64.40	64.40
25017	1210036	03	0103	40200701	VOC	64.40	64.40	64.40
25017	1210036	05	0104	40200710	VOC	64.40	64.40	64.40
25017	1210036	07	0105	40200701	VOC	64.40	64.40	64.40
25017	1210373	01	0101	40200701	VOC	64.40	64.40	64.40
25017	1210373	02	0102	40200701	VOC	64.40	64.40	64.40
25017	1210373	03	0103	40200701	VOC	64.40	64.40	64.40
25017	1210373	04	0104	40200701	VOC	64.40	64.40	64.40
25017	1210373	04	0204	40200701	VOC	64.40	64.40	64.40
25017	1210373	05	0105	40200701	VOC	64.40	64.40	64.40
25017	1210373	05	0205	40200701	VOC	64.40	64.40	64.40
25017	1210373	06	0106	40200701	VOC	64.40	64.40	64.40
25017	1210373	06	0206	40200701	VOC	64.40	64.40	64.40
25017	1210373	09	0109	40200701	VOC	64.40	64.40	64.40
25017	1210373	10	0110	40200701	VOC	64.40	64.40	64.40
25017	1210912	02	0202	40200710	VOC	64.40	64.40	64.40
25021	1190319	04	0103	40200710	VOC	64.40	64.40	64.40
25021	1190319	11	0111	40200710	VOC	64.40	64.40	64.40
25021	1190569	23	0215	40200710	VOC	64.40	64.40	64.40
25021	1192106	03	0103	40200710	VOC	64.40	64.40	64.40
25021	1192121	07	0107	40200701	VOC	64.40	64.40	64.40
25021	1192131	03	0103	40200710	VOC	64.40	64.40	64.40
25021	1192491	07	0107	40200701	VOC	64.40	64.40	64.40
25021	1192491	08	0108	40200701	VOC	64.40	64.40	64.40

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
25021	1200125	55	0146	40200710	VOC	64.40	64.40	64.40
25021	1200125	56	0147	40200710	VOC	64.40	64.40	64.40
25021	1200127	10	0209	40200710	VOC	64.40	64.40	64.40
25021	1200228	04	0203	40200710	VOC	64.40	64.40	64.40
25021	1200452	04	0102	40200701	VOC	64.40	64.40	64.40
25023	1192198	11	0107	40200710	VOC	64.40	64.40	64.40
25023	1192198	12	0108	40200710	VOC	64.40	64.40	64.40
25023	1192198	19	0109	40200710	VOC	64.40	64.40	64.40
25023	1192198	23	0109	40200710	VOC	64.40	64.40	64.40
25023	1192198	25	0109	40200710	VOC	64.40	64.40	64.40
25023	1192198	26	0109	40200710	VOC	64.40	64.40	64.40
25023	1192203	01	0101	40200710	VOC	64.40	64.40	64.40
25023	1192237	08	0102	40200710	VOC	64.40	64.40	64.40
25023	1192436	09	0105	40200701	VOC	64.40	64.40	64.40
25023	1200177	05	0105	40200701	VOC	64.40	64.40	64.40
25023	1200637	04	0104	40200710	VOC	64.40	64.40	64.40
25023	1200637	07	0105	40200707	VOC	64.40	64.40	64.40
25025	1191397	05	0106	40200701	VOC	64.40	64.40	64.40
25025	1191397	06	0107	40200701	VOC	64.40	64.40	64.40
25027	1180025	01	0301	40200710	VOC	64.40	64.40	64.40
25027	1180115	17	0209	40200701	VOC	64.40	64.40	64.40
25027	1180115	25	0311	40200710	VOC	64.40	64.40	64.40
25027	1180115	36	0117	40200710	VOC	64.40	64.40	64.40
25027	1180115	39	0118	40200701	VOC	64.40	64.40	64.40
25027	1180115	77	0251	40200710	VOC	64.40	64.40	64.40
25027	1180225	04	0104	40200710	VOC	64.40	64.40	64.40
25027	1180265	05	0205	40200701	VOC	64.40	64.40	64.40
25027	1180310	03	0203	40200701	VOC	64.40	64.40	64.40
25027	1180310	03	0303	40200701	VOC	64.40	64.40	64.40
25027	1180505	07	0107	40200701	VOC	64.40	64.40	64.40
25027	1180505	23	0123	40200710	VOC	64.40	64.40	64.40
25027	1180998	27	0111	40200710	VOC	64.40	64.40	64.40
25027	1180998	30	0113	40200701	VOC	64.40	64.40	64.40
25027	1200856	12	0110	40200701	VOC	64.40	64.40	64.40
25027	1200856	13	0111	40200701	VOC	64.40	64.40	64.40
33011	3301100076	004	1	40200701	VOC	64.40	64.40	64.40
33011	3301100076	005	1	40200701	VOC	64.40	64.40	64.40
33011	3301100076	009	1	40200701	VOC	64.40	64.40	64.40
33017	3301700010	001	1	40200701	VOC	64.40	64.40	64.40
33017	3301700010	002	1	40200701	VOC	64.40	64.40	64.40
36063	9290900018	ADHES1	HM1FP	40200701	VOC	64.40	64.40	64.40
36069	8329900028	000005	WABFP	40200701	VOC	64.40	64.40	64.40
36103	1473000001	EI0001	E10EI	40200701	VOC	64.40	64.40	64.40
36103	1473000001	U00002	103FP	40200706	VOC	64.40	64.40	64.40
36115	5533000016	U00011	SL2FP	40200710	VOC	64.40	64.40	64.40
36117	8543600007	1MLDRB	SC3FP	40200701	VOC	64.40	64.40	64.40
36117	8543600007	2KLZRS	SC2FP	40200701	VOC	64.40	64.40	64.40

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
42001	420010009	103	1	40200706	VOC	64.40	64.40	64.40
42013	420130480	101	2	40200701	VOC	64.40	64.40	64.40
42017	420171041	101	1	40200701	VOC	64.40	64.40	64.40
42019	420190029	104	1	40200701	VOC	64.40	64.40	64.40
42019	420190029	105	1	40200701	VOC	64.40	64.40	64.40
42019	420190090	102	1	40200701	VOC	64.40	64.40	64.40
42019	420190090	102	2	40200701	VOC	64.40	64.40	64.40
42019	420190090	102	3	40200701	VOC	64.40	64.40	64.40
42019	420190090	102	4	40200701	VOC	64.40	64.40	64.40
42019	420190090	102	5	40200701	VOC	64.40	64.40	64.40
42019	420190090	102	6	40200701	VOC	64.40	64.40	64.40
42035	420350429	P105	1	40200710	VOC	64.40	64.40	64.40
42035	420350429	P106	1	40200710	VOC	64.40	64.40	64.40
42039	420390013	106	1	40200707	VOC	64.40	64.40	64.40
42039	420390014	102	1	40200701	VOC	64.40	64.40	64.40
42039	420390014	103	1	40200701	VOC	64.40	64.40	64.40
42039	420390014	104	1	40200701	VOC	64.40	64.40	64.40
42039	420390014	105	1	40200701	VOC	64.40	64.40	64.40
42045	420450954	121	1	40200701	VOC	64.40	64.40	64.40
42055	420550022	100	1	40200706	VOC	64.40	64.40	64.40
42055	420550022	101	1	40200706	VOC	64.40	64.40	64.40
42061	420610016	104	1	40200701	VOC	64.40	64.40	64.40
42061	420610016	105	1	40200701	VOC	64.40	64.40	64.40
42061	420610032	101	2	40200701	VOC	64.40	64.40	64.40
42061	420610032	101	4	40200701	VOC	64.40	64.40	64.40
42061	420610032	101	6	40200701	VOC	64.40	64.40	64.40
42061	420610032	102	2	40200701	VOC	64.40	64.40	64.40
42061	420610032	102	4	40200701	VOC	64.40	64.40	64.40
42061	420610032	102	6	40200701	VOC	64.40	64.40	64.40
42061	420610032	103	2	40200701	VOC	64.40	64.40	64.40
42061	420610032	103	4	40200701	VOC	64.40	64.40	64.40
42069	420690023	107	1	40200701	VOC	64.40	64.40	64.40
42069	420690023	108	1	40200701	VOC	64.40	64.40	64.40
42071	420710802	102	1	40200710	VOC	64.40	64.40	64.40
42071	420710804	102	1	40200710	VOC	64.40	64.40	64.40
42077	420770071	101	1	40200710	VOC	64.40	64.40	64.40
42077	420770071	101	2	40200710	VOC	64.40	64.40	64.40
42077	420770071	102	1	40200710	VOC	64.40	64.40	64.40
42077	420770071	102	2	40200710	VOC	64.40	64.40	64.40
42077	420770071	103	1	40200710	VOC	64.40	64.40	64.40
42077	420770071	104	1	40200710	VOC	64.40	64.40	64.40
42077	420770071	105	1	40200710	VOC	64.40	64.40	64.40
42081	420810039	113	1	40200710	VOC	64.40	64.40	64.40
42081	420810559	P104	1	40200710	VOC	64.40	64.40	64.40
42091	420910826	002	1	40200701	VOC	64.40	64.40	64.40
42097	420970001	105	1	40200710	VOC	64.40	64.40	64.40
42097	420970001	201	1	40200710	VOC	64.40	64.40	64.40

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
42097	420970001	202	1	40200710	VOC	64.40	64.40	64.40
42097	420970034	104	1	40200710	VOC	64.40	64.40	64.40
42097	420970034	105A	1	40200710	VOC	64.40	64.40	64.40
42101	4210101591	004	1	40200701	VOC	64.40	64.40	64.40
42101	4210102051	005	10	40200712	VOC	64.40	64.40	64.40
42101	4210102051	005	11	40200712	VOC	64.40	64.40	64.40
42101	4210102051	005	12	40200712	VOC	64.40	64.40	64.40
42101	4210102051	006	5	40200712	VOC	64.40	64.40	64.40
42101	4210102051	007	6	40200712	VOC	64.40	64.40	64.40
42101	4210102051	008	14	40200712	VOC	64.40	64.40	64.40
42101	4210102051	009	7	40200712	VOC	64.40	64.40	64.40
42101	4210103217	010	2	40200710	VOC	64.40	64.40	64.40
42109	421090001	113	1	40200710	VOC	64.40	64.40	64.40
42109	421090001	140	1	40200710	VOC	64.40	64.40	64.40
42119	421190477	P101	1	40200710	VOC	64.40	64.40	64.40
42129	421290071	105	1	40200701	VOC	64.40	64.40	64.40
42129	421290311	101	1	40200701	VOC	64.40	64.40	64.40
42133	421330034	103	1	40200701	VOC	64.40	64.40	64.40
42133	421330055	101	1	40200706	VOC	64.40	64.40	64.40
42133	421330055	101	2	40200706	VOC	64.40	64.40	64.40
44003	AIR1438	8	8	40200710	VOC	64.40	64.40	64.40
44007	AIR1859	2	2	40200701	VOC	64.40	64.40	64.40
44007	AIR3850	1	1	40200701	VOC	64.40	64.40	64.40
44007	AIR537	2	2	40200710	VOC	64.40	64.40	64.40
44009	AIR594	7	7	40200710	VOC	64.40	64.40	64.40
50005	9	4	1	40200701	VOC	64.40	64.40	64.40
Control Measure: Asphalt Production Plants								
34001	70003	U101	OS1	30500207	NOX	0.00	35.00	35.00
34001	70003	U101	OS2	30500207	NOX	0.00	35.00	35.00
34001	70003	U12	OS0	30500207	NOX	0.00	35.00	35.00
34001	70003	U13	OS0	30500207	NOX	0.00	35.00	35.00
34001	70003	U6	OS1	30500207	NOX	0.00	35.00	35.00
34001	70015	U401	OS1601	30500207	NOX	0.00	35.00	35.00
34001	70015	U401	OS2101	30500207	NOX	0.00	35.00	35.00
34001	70015	U401	OS401	30500207	NOX	0.00	35.00	35.00
34007	50373	U11	OS1	30500207	NOX	0.00	35.00	35.00
34007	50373	U6	OS1	30500207	NOX	0.00	35.00	35.00
34009	73014	U9	OS3	30500207	NOX	0.00	35.00	35.00
34009	73014	U9	OS7	30500207	NOX	0.00	35.00	35.00
34013	05005	U2	OS1	30500207	NOX	0.00	35.00	35.00
34015	55261	U4	OS1	30500207	NOX	0.00	35.00	35.00
34017	11171	U2	OS1	30500207	NOX	0.00	35.00	35.00
34021	60031	U6	OS1	30500207	NOX	0.00	35.00	35.00
34023	15129	U7	OS1	30500207	NOX	0.00	35.00	35.00
34025	20022	U1	OS1	30500207	NOX	0.00	35.00	35.00
34025	20023	U2	OS1	30500207	NOX	0.00	35.00	35.00
34025	20025	U26	OS1	30500207	NOX	0.00	35.00	35.00

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
34025	20025	U3	OS2	30500207	NOX	0.00	35.00	35.00
34027	25009	U13	OS1	30500207	NOX	0.00	35.00	35.00
34027	25009	U2	OS1	30500207	NOX	0.00	35.00	35.00
34027	25268	U100	OS101	30500207	NOX	0.00	35.00	35.00
34027	25268	U1601	OS1601	30500207	NOX	0.00	35.00	35.00
34027	25268	U1601	OS1602	30500207	NOX	0.00	35.00	35.00
34029	78010	U1500	OS1501	30500207	NOX	0.00	35.00	35.00
34029	78010	U1500	OS1502	30500207	NOX	0.00	35.00	35.00
34029	78010	U1601	OS1601	30500207	NOX	0.00	35.00	35.00
34029	78010	U900	OS1	30500207	NOX	0.00	35.00	35.00
34029	78012	U101	OS1	30500207	NOX	0.00	35.00	35.00
34029	78014	U2	OS1	30500207	NOX	0.00	35.00	35.00
34031	30005	U100	OS113	30500207	NOX	0.00	35.00	35.00
34031	30005	U2300	OS2301	30500207	NOX	0.00	35.00	35.00
34031	30005	U2300	OS2332	30500207	NOX	0.00	35.00	35.00
34031	30085	U100	OS201	30500207	NOX	0.00	35.00	35.00
34031	30085	U100	OS901	30500207	NOX	0.00	35.00	35.00
34031	30085	U100	OS903	30500207	NOX	0.00	35.00	35.00
34035	35014	U100	OS113	30500207	NOX	0.00	35.00	35.00
34035	35014	U100	OS2301	30500207	NOX	0.00	35.00	35.00
34035	36009	U1000	OS1201	30500207	NOX	0.00	35.00	35.00
34035	36009	U1000	OS1202	30500207	NOX	0.00	35.00	35.00
34035	36009	U1000	OS1301	30500207	NOX	0.00	35.00	35.00
34035	36009	U1000	OS1401	30500207	NOX	0.00	35.00	35.00
34037	83008	U4	OS1	30500207	NOX	0.00	35.00	35.00
36081	2630200138	D00001	P01FP	30500251	NOX	35.00	35.00	35.00
36085	2640300031	3ADRYR	302FP	30500251	NOX	35.00	35.00	35.00
36119	3550800247	1MIXER	001FP	30500205	NOX	35.00	35.00	35.00
Control Measure: Cement Kilns								
23013	2301300028	001	1	30500706	NOX	60.00	60.00	60.00
24013	013-0012	39	01S39	30500606	NOX	46.67	46.67	46.67
24021	021-0013	21	01S21	30500706	NOX	46.67	46.67	46.67
24021	021-0013	22	01S22	30500706	NOX	46.67	46.67	46.67
24043	043-0008	24	01S24	30500606	NOX	46.67	46.67	46.67
36001	4012200004	U00002	OX1FP	30501202	NOX	70.00	70.00	70.00
36001	4012200004	U00003	FZ1FP	30501204	NOX	70.00	70.00	70.00
36001	4012200004	U00003	FZ2FP	30501204	NOX	70.00	70.00	70.00
36001	4012200004	U00003	SS1FP	30501206	NOX	70.00	70.00	70.00
36001	4012200004	U00012	OX2FP	30501202	NOX	70.00	70.00	70.00
36001	4012200004	U00013	FC2FP	30501204	NOX	70.00	70.00	70.00
36001	4012400001	041000	K12FP	30500706	NOX	20.00	20.00	20.00
36039	4192600021	U00K18	00CEP	30500706	NOX	20.00	20.00	20.00
36113	5520500013	0UKILN	G02FP	30500606	NOX	20.00	20.00	20.00
42019	420190024	101	4	30500706	NOX	0.00	52.38	52.38
42019	420190024	121	4	30500706	NOX	0.00	52.38	52.38
42073	420730024	226	1	30500606	NOX	0.00	54.29	54.29
42073	420730024	227	1	30500606	NOX	0.00	60.00	60.00

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
42073	420730024	228	1	30500606	NOX	0.00	54.18	54.18
42073	420730026	501	1	30500706	NOX	0.00	56.52	56.52
42073	420730026	502	1	30500706	NOX	0.00	56.52	56.52
42077	420770019	101	2	30500606	NOX	0.00	54.40	54.40
42079	420790013	101	1	30501201	NOX	85.00	85.00	85.00
42079	420790013	102	1	30501201	NOX	85.00	85.00	85.00
42079	420790013	103	1	30501204	NOX	85.00	85.00	85.00
42079	420790013	104	1	30501204	NOX	85.00	85.00	85.00
42079	420790060	104	1	30501301	NOX	85.00	85.00	85.00
42095	420950006	102	1	30500606	NOX	0.00	57.04	57.04
42095	420950006	122	1	30500606	NOX	0.00	57.04	57.04
42095	420950012	101	2	30500706	NOX	0.00	45.21	45.21
42095	420950012	102	2	30500706	NOX	0.00	45.21	45.21
42095	420950045	142	1	30500606	NOX	0.00	32.20	32.20
42095	420950045	143	1	30500606	NOX	0.00	32.20	32.20
42095	420950127	101	1	30500606	NOX	0.00	32.20	32.20
42095	420950127	102	1	30500606	NOX	0.00	32.20	32.20
42095	420950127	103	1	30500606	NOX	0.00	32.20	32.20
42095	420950127	104	1	30500606	NOX	0.00	32.20	32.20
42133	421330060	200	4	39000602	NOX	0.00	45.21	45.21
Control Measure: Glass and Fiberglass Furnaces								
24510	510-0285	10	01S10	30501402	NOX	85.00	85.00	85.00
25027	1200856	04	0304	30501402	NOX	85.00	85.00	85.00
25027	1200856	05	0304	30501402	NOX	85.00	85.00	85.00
34005	45982	U6	OS0	39999991	NOX	0.00	20.00	20.00
34011	75475	U1	OS1	30501401	NOX	0.00	20.00	20.00
34011	75475	U3	OS1	30501401	NOX	0.00	20.00	20.00
34011	75475	U35	OS1	30501401	NOX	0.00	20.00	20.00
34011	75475	U37	OS1	30501401	NOX	0.00	20.00	20.00
34011	75475	U5	OS1	30501401	NOX	0.00	20.00	20.00
34011	75503	U2	OS1001	30501401	NOX	0.00	20.00	20.00
34011	75503	U3	OS1	30501401	NOX	0.00	20.00	20.00
34011	75503	U4	OS1	30501401	NOX	0.00	20.00	20.00
34011	75503	U5	OS1	30501401	NOX	0.00	20.00	20.00
34011	75505	U12	OS1	30599999	NOX	0.00	20.00	20.00
34011	75505	U143	OS1	30599999	NOX	0.00	20.00	20.00
34011	75505	U144	OS1	30599999	NOX	0.00	20.00	20.00
34011	75505	U146	OS1	30599999	NOX	0.00	20.00	20.00
34011	75505	U150	OS1	30599999	NOX	0.00	20.00	20.00
34011	75505	U151	OS1	30599999	NOX	0.00	20.00	20.00
34011	75505	U6	OS1	30599999	NOX	0.00	20.00	20.00
34011	75506	U1	OS1	30501401	NOX	0.00	20.00	20.00
34011	75506	U1	OS3	30501401	NOX	0.00	20.00	20.00
34023	18070	U1	OS1	30501401	NOX	0.00	20.00	20.00
34033	65499	U1	OS1	30501401	NOX	0.00	20.00	20.00
34033	65499	U2	OS1	30501401	NOX	0.00	20.00	20.00
34033	65499	U3	OS1	30501401	NOX	0.00	20.00	20.00

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36001	4010300016	KILNSG	10BEI	39001399	NOX	20.00	20.00	20.00
36001	4010300016	KILNSG	KNFFP	39001399	NOX	20.00	20.00	20.00
36001	4012200004	EI0001	E20EI	39000689	NOX	70.00	70.00	70.00
36011	7055200004	AFURNC	FRNFP	30501402	NOX	70.00	70.00	70.00
36015	8070400036	000001	O1AFP	30501402	NOX	70.00	70.00	70.00
36069	8320500041	UFURNC	FURFP	30501403	NOX	70.00	70.00	70.00
36089	6403000002	U00001	101FP	30501401	NOX	70.00	70.00	70.00
36089	6403000002	U00003	300FP	30501416	NOX	70.00	70.00	70.00
36101	8460300008	PCCTNK	GL2FP	30501416	NOX	70.00	70.00	70.00
42003	4200300164	003	1	30501404	NOX	85.00	85.00	85.00
42003	4200300164	007	1	30501404	NOX	85.00	85.00	85.00
42003	4200300164	008	1	30501404	NOX	85.00	85.00	85.00
42003	4200300165	P01	1	30501402	NOX	85.00	85.00	85.00
42003	4200300165	P02	1	30501402	NOX	85.00	85.00	85.00
42003	4200300165	P04	1	30501402	NOX	85.00	85.00	85.00
42003	4200300227	003	1	30590003	NOX	85.00	85.00	85.00
42003	4200300227	003	2	30590003	NOX	85.00	85.00	85.00
42003	4200300342	002	1	30501403	NOX	85.00	85.00	85.00
42003	4200300342	002	3	30501403	NOX	85.00	85.00	85.00
42007	420070012	103	1	30501402	NOX	85.00	85.00	85.00
42007	420070012	104	1	30501408	NOX	85.00	85.00	85.00
42007	420070012	105	1	30501408	NOX	85.00	85.00	85.00
42007	420070022	102	1	30501799	NOX	85.00	85.00	85.00
42027	420270021	P101	1	30501404	NOX	85.00	85.00	85.00
42027	420270021	P102	1	30501404	NOX	85.00	85.00	85.00
42027	420270021	P102	3	30501404	NOX	85.00	85.00	85.00
42027	420270021	P103	1	30501404	NOX	85.00	85.00	85.00
42031	420310009	102	1	30501402	NOX	85.00	85.00	85.00
42031	420310009	S105A	1	30501402	NOX	85.00	85.00	85.00
42039	420390012	101	1	30501403	NOX	85.00	85.00	85.00
42039	420390012	102	1	30501403	NOX	85.00	85.00	85.00
42041	420410013	101	1	30501403	NOX	85.00	85.00	85.00
42041	420410013	102	1	30501403	NOX	85.00	85.00	85.00
42045	420450041	101	1	30501410	NOX	85.00	85.00	85.00
42051	420510020	101	1	30501402	NOX	85.00	85.00	85.00
42051	420510020	102	1	30501402	NOX	85.00	85.00	85.00
42065	420650003	110	1	30501402	NOX	85.00	85.00	85.00
42065	420650007	103	1	30501402	NOX	85.00	85.00	85.00
42065	420650007	104	1	30501402	NOX	85.00	85.00	85.00
42079	420790008	101	1	30501704	NOX	85.00	85.00	85.00
42079	420790008	102	1	30501704	NOX	85.00	85.00	85.00
42079	420790008	103	1	30501701	NOX	85.00	85.00	85.00
42079	420790018	101	1	30501402	NOX	85.00	85.00	85.00
42079	420790018	101	2	30501402	NOX	85.00	85.00	85.00
42079	420790018	102	1	30501402	NOX	85.00	85.00	85.00
42079	420790018	102	2	30501402	NOX	85.00	85.00	85.00
42079	420790018	103	1	30501402	NOX	85.00	85.00	85.00

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
42083	420830002	101	1	30501402	NOX	85.00	85.00	85.00
42083	420830002	201	1	30501402	NOX	85.00	85.00	85.00
42083	420830006	101	1	30501402	NOX	85.00	85.00	85.00
42083	420830006	102	1	30501402	NOX	85.00	85.00	85.00
42083	420830006	103	1	30501402	NOX	85.00	85.00	85.00
42095	420950047	101A	3	30501701	NOX	85.00	85.00	85.00
42095	420950047	103A	3	30501701	NOX	85.00	85.00	85.00
42117	421170020	P109	1	30501402	NOX	85.00	85.00	85.00
42117	421170020	P124	1	30501404	NOX	85.00	85.00	85.00
42117	421170020	P127	1	30501408	NOX	85.00	85.00	85.00
42125	421250001	107	1	30501404	NOX	85.00	85.00	85.00
42125	421250001	107	3	30501404	NOX	85.00	85.00	85.00
42129	421290233	101	2	30501404	NOX	85.00	85.00	85.00
42129	421290233	102	2	30501404	NOX	85.00	85.00	85.00
42129	421290553	101	1	30501402	NOX	85.00	85.00	85.00
42133	421330066	104	3	30501414	NOX	85.00	85.00	85.00

Table E-2 NonEGU BOTW Control Factors for ICI Boilers

	Boiler Size Range (mmBtu/hour)						
	< 25	25 to 50	50 to 100	100 to 250	>250		
SCC	CF0_25	CF25_50	CF50_100	CF100_250	CF250	SCC_L4	SCC_L3
10200104	10	50	10	40	0	Traveling Grate (Overfeed) Stoker	Anthracite Coal
10200202	10	50	10	40	0	Pulverized Coal: Dry Bottom	Bituminous/Subbituminous Coal
10200203	10	50	10	40	0	Cyclone Furnace	Bituminous/Subbituminous Coal
10200204	10	50	10	40	0	Spreader Stoker	Bituminous/Subbituminous Coal
10200205	10	50	10	40	0	Overfeed Stoker	Bituminous/Subbituminous Coal
10200206	10	50	10	40	0	Underfeed Stoker	Bituminous/Subbituminous Coal
10200212	10	50	10	40	0	Pulverized Coal: Dry Bottom (Tangential)	Bituminous/Subbituminous Coal
10200222	10	50	10	40	0	Pulverized Coal: Dry Bottom (Subbituminous Coal)	Bituminous/Subbituminous Coal
10200401	10	50	10	40	0	Grade 6 Oil	Residual Oil
10200402	10	50	10	40	0	10-100 Million Btu/hr **	Residual Oil
10200403	10	50	10	40	0	< 10 Million Btu/hr **	Residual Oil
10200404	10	50	10	40	0	Grade 5 Oil	Residual Oil
10200405	10	50	10	40	0	Cogeneration	Residual Oil
10200501	10	50	10	40	0	Grades 1 and 2 Oil	Distillate Oil
10200502	10	50	10	40	0	10-100 Million Btu/hr **	Distillate Oil
10200503	10	50	10	40	0	< 10 Million Btu/hr **	Distillate Oil
10200504	10	50	10	40	0	Grade 4 Oil	Distillate Oil
10200505	10	50	10	40	0	Cogeneration	Distillate Oil
10200601	10	50	10	75	0	> 100 Million Btu/hr	Natural Gas
10200602	10	50	10	75	0	10-100 Million Btu/hr	Natural Gas
10200603	10	50	10	75	0	< 10 Million Btu/hr	Natural Gas
10200604	10	50	10	75	0	Cogeneration	Natural Gas
10200701	10	50	10	75	0	Petroleum Refinery Gas	Process Gas
10200704	10	50	10	75	0	Blast Furnace Gas	Process Gas
10200707	10	50	10	75	0	Coke Oven Gas	Process Gas
10200710	10	50	10	75	0	Cogeneration	Process Gas
10200799	10	50	10	75	0	Other: Specify in Comments	Process Gas
10200802	10	50	10	40	0	All Boiler Sizes	Petroleum Coke
10200901	10	10	10	10	10	Bark-fired Boiler	Wood/Bark Waste
10200902	10	10	10	10	10	Wood/Bark-fired Boiler	Wood/Bark Waste

SCC	Boiler Size Range (mmBtu/hour) < 25 CF0_25	25 to 50 CF25_50	50 to 100 CF50_100	100 to 250 CF100_250	>250 CF250	SCC_L4	SCC_L3
10200903	10	10	10	10	10	Wood-fired Boiler - Wet Wood (>=20% moisture)	Wood/Bark Waste
10200904	10	10	10	10	10	Bark-fired Boiler (< 50,000 Lb Steam) **	Wood/Bark Waste
10200905	10	10	10	10	10	Wood/Bark-fired Boiler (< 50,000 Lb Steam) **	Wood/Bark Waste
10200906	10	10	10	10	10	Wood-fired Boiler (< 50,000 Lb Steam) **	Wood/Bark Waste
10200907	10	10	10	10	10	Wood Cogeneration	Wood/Bark Waste
10200908	10	10	10	10	10	Wood-fired Boiler - Dry Wood (<20% moisture)	Wood/Bark Waste
10201001	10	50	10	75	0	Butane	Liquified Petroleum Gas (LPG)
10201002	10	50	10	75	0	Propane	Liquified Petroleum Gas (LPG)
10201003	10	50	10	75	0	Butane/Propane Mixture: Specify Percent Butane in	Liquified Petroleum Gas (LPG)
10300101	10	50	10	40	0	Pulverized Coal	Anthracite Coal
10300102	10	50	10	40	0	Traveling Grate (Overfeed) Stoker	Anthracite Coal
10300103	10	50	10	40	0	Hand-fired	Anthracite Coal
10300203	10	50	10	40	0	Cyclone Furnace (Bituminous Coal)	Bituminous/Subbituminous Coal
10300206	10	50	10	40	0	Pulverized Coal: Dry Bottom (Bituminous Coal)	Bituminous/Subbituminous Coal
10300207	10	50	10	40	0	Overfeed Stoker (Bituminous Coal)	Bituminous/Subbituminous Coal
10300208	10	50	10	40	0	Underfeed Stoker (Bituminous Coal)	Bituminous/Subbituminous Coal
10300209	10	50	10	40	0	Spreader Stoker (Bituminous Coal)	Bituminous/Subbituminous Coal
10300225	10	50	10	40	0	Traveling Grate (Overfeed) Stoker (Subbituminous C	Bituminous/Subbituminous Coal
10300226	10	50	10	40	0	Pulverized Coal: Dry Bottom Tangential (Subbitumin	Bituminous/Subbituminous Coal
10300401	10	50	10	40	0	Grade 6 Oil	Residual Oil
10300402	10	50	10	40	0	10-100 Million Btu/hr **	Residual Oil
10300403	10	50	10	40	0	< 10 Million Btu/hr **	Residual Oil
10300404	10	50	10	40	0	Grade 5 Oil	Residual Oil
10300501	10	50	10	40	0	Grades 1 and 2 Oil	Distillate Oil
10300502	10	50	10	40	0	10-100 Million Btu/hr **	Distillate Oil
10300503	10	50	10	40	0	< 10 Million Btu/hr **	Distillate Oil
10300504	10	50	10	40	0	Grade 4 Oil	Distillate Oil
10300601	10	50	10	75	0	> 100 Million Btu/hr	Natural Gas
10300602	10	50	10	75	0	10-100 Million Btu/hr	Natural Gas
10300603	10	50	10	75	0	< 10 Million Btu/hr	Natural Gas
10300701	10	50	10	75	0	POTW Digester Gas-fired Boiler	Process Gas
10300799	10	50	10	75	0	Other Not Classified	Process Gas

	Boiler Size Range (mmBtu/hour)						
	< 25	25 to 50	50 to 100	100 to 250	>250		
SCC	CF0_25	CF25_50	CF50_100	CF100_250	CF250	SCC_L4	SCC_L3
10300811	10	50	10	75	0	Landfill Gas	Landfill Gas
10300901	10	10	10	10	0	Bark-fired Boiler	Wood/Bark Waste
10300902	10	10	10	10	0	Wood/Bark-fired Boiler	Wood/Bark Waste
10300903	10	10	10	10	0	Wood-fired Boiler - Wet Wood (>=20% moisture)	Wood/Bark Waste
10300908	10	10	10	10	0	Wood-fired Boiler - Dry Wood (<20% moisture)	Wood/Bark Waste
10301002	10	50	10	75	0	Propane	Liquified Petroleum Gas (LPG)
10301003	10	50	10	75	0	Butane/Propane Mixture: Specify Percent Butane in	Liquified Petroleum Gas (LPG)

Table E-3 Area Source BOTW Control Factors for Adhesives and Sealants Application, Asphalt Paving, Consumer Products, and Portable Fuel Containers

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
Control Measure: Adhesives and Sealants					
09	2440020000	VOC	64.40	64.40	64.40
10	2440020000	VOC	64.40	64.40	64.40
11	2440020000	VOC	64.40	64.40	64.40
23	2440020000	VOC	64.40	64.40	64.40
24	2440020000	VOC	64.40	64.40	64.40
25	2440020000	VOC	64.40	64.40	64.40
33	2440020000	VOC	64.40	64.40	64.40
34	2440020000	VOC	64.40	64.40	64.40
36	2440020000	VOC	64.40	64.40	64.40
42	2440020000	VOC	64.40	64.40	64.40
44	2440020000	VOC	64.40	64.40	64.40
Control Measure: Asphalt Paving					
09	2461022000	VOC	20.00	20.00	20.00
24	2461022000	VOC	20.00	20.00	20.00
25	2461022000	VOC	20.00	20.00	20.00
33	2461022000	VOC	20.00	20.00	20.00
34	2461022000	VOC	75.00	75.00	75.00
36	2461022000	VOC	20.00	20.00	20.00
42	2461022000	VOC	0.00	20.00	20.00
Control Measure: Consumer Products					
09	2465000000	VOC	2.00	2.00	2.00
10	2460100000	VOC	2.00	2.00	2.00
10	2460200000	VOC	2.00	2.00	2.00
10	2460400000	VOC	2.00	2.00	2.00
10	2460500000	VOC	2.00	2.00	2.00
10	2460600000	VOC	2.00	2.00	2.00
10	2460800000	VOC	2.00	2.00	2.00
10	2460900000	VOC	2.00	2.00	2.00
11	2460100000	VOC	2.00	2.00	2.00
11	2460200000	VOC	2.00	2.00	2.00
11	2460400000	VOC	2.00	2.00	2.00
11	2460500000	VOC	2.00	2.00	2.00
11	2460600000	VOC	2.00	2.00	2.00
11	2460800000	VOC	2.00	2.00	2.00
11	2460900000	VOC	2.00	2.00	2.00
23	2460100000	VOC	2.00	2.00	2.00
23	2460200000	VOC	2.00	2.00	2.00
23	2460400000	VOC	2.00	2.00	2.00
23	2460500000	VOC	2.00	2.00	2.00
23	2460600000	VOC	2.00	2.00	2.00
23	2460800000	VOC	2.00	2.00	2.00

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
23	2460900000	VOC	2.00	2.00	2.00
24	2465000000	VOC	2.00	2.00	2.00
25	2460000000	VOC	2.00	2.00	2.00
33	2460000000	VOC	2.00	2.00	2.00
34	2465000000	VOC	2.00	2.00	2.00
36	2460000000	VOC	2.00	2.00	2.00
42	2465000000	VOC	2.00	2.00	2.00
44	2460100000	VOC	2.00	2.00	2.00
44	2460200000	VOC	2.00	2.00	2.00
44	2460400000	VOC	2.00	2.00	2.00
44	2460500000	VOC	2.00	2.00	2.00
44	2460600000	VOC	2.00	2.00	2.00
44	2460800000	VOC	2.00	2.00	2.00
44	2460900000	VOC	2.00	2.00	2.00
Control Measure: Portable Fuel Containers					
09	2501060300	VOC	5.80	23.20	58.00
10	2501011010	VOC	5.80	23.20	58.00
10	2501011011	VOC	5.80	23.20	58.00
10	2501011012	VOC	5.80	23.20	58.00
10	2501011015	VOC	5.80	23.20	58.00
10	2501011016	VOC	5.80	23.20	58.00
10	2501012010	VOC	5.80	23.20	58.00
10	2501012011	VOC	5.80	23.20	58.00
10	2501012012	VOC	5.80	23.20	58.00
10	2501012015	VOC	5.80	23.20	58.00
10	2501012016	VOC	5.80	23.20	58.00
11	2501011011	VOC	5.80	23.20	58.00
11	2501011012	VOC	5.80	23.20	58.00
11	2501011016	VOC	5.80	23.20	58.00
11	2501012011	VOC	5.80	23.20	58.00
11	2501012012	VOC	5.80	23.20	58.00
11	2501012016	VOC	5.80	23.20	58.00
23	2501060300	VOC	5.80	23.20	58.00
24	2501011011	VOC	5.80	23.20	58.00
24	2501011012	VOC	5.80	23.20	58.00
24	2501011016	VOC	5.80	23.20	58.00
24	2501012011	VOC	5.80	23.20	58.00
24	2501012012	VOC	5.80	23.20	58.00
24	2501012016	VOC	5.80	23.20	58.00
25	2501011000	VOC	0.00	23.20	58.00
25	2501012000	VOC	0.00	23.20	58.00
33	2501060300	VOC	5.80	23.20	58.00
34	2501000120	VOC	5.80	23.20	58.00
36	2501011011	VOC	5.80	23.20	58.00
36	2501011012	VOC	5.80	23.20	58.00
36	2501011016	VOC	5.80	23.20	58.00
36	2501012011	VOC	5.80	23.20	58.00

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
36	2501012012	VOC	5.80	23.20	58.00
36	2501012016	VOC	5.80	23.20	58.00
42	2501060300	VOC	5.80	23.20	58.00
44	2501060300	VOC	5.80	23.20	58.00

Table E-4 Area Source BOTW Control Factors for ICI Boilers

SCC	Control Factor	SCC_L4	SCC_L3	SCC_L2
2102001000	18.9	Total: All Boiler Types	Anthracite Coal	Industrial
2102002000	18.9	Total: All Boiler Types	Bituminous/Subbituminous Coal	Industrial
2102004000	18.9	Total: Boilers and IC Engines	Distillate Oil	Industrial
2102005000	18.9	Total: All Boiler Types	Residual Oil	Industrial
2102006000	18.9	Total: Boilers and IC Engines	Natural Gas	Industrial
2102007000	18.9	Total: All Boiler Types	Liquified Petroleum Gas (LPG)	Industrial
2102008000	10.0	Total: All Boiler Types	Wood	Industrial
2102011000	10.0	Total: All Boiler Types	Kerosene	Industrial
2103001000	19.5	Total: All Boiler Types	Anthracite Coal	Commercial/Institutional
2103002000	19.5	Total: All Boiler Types	Bituminous/Subbituminous Coal	Commercial/Institutional
2103004000	19.5	Total: Boilers and IC Engines	Distillate Oil	Commercial/Institutional
2103004001	19.5		Distillate Oil	Commercial/Institutional
2103004002	19.5		Distillate Oil	Commercial/Institutional
2103005000	19.5	Total: All Boiler Types	Residual Oil	Commercial/Institutional
2103006000	19.5	Total: Boilers and IC Engines	Natural Gas	Commercial/Institutional
2103007000	19.5	Total: All Combustor Types	Liquified Petroleum Gas (LPG)	Commercial/Institutional
2103008000	10.0	Total: All Boiler Types	Wood	Commercial/Institutional
2103011000	10.0	Total: All Combustor Types	Kerosene	Commercial/Institutional