

CHANGES TO LADCO WHITE PAPERS

I. Changes since December 30, 2006 (March 10, 2006)

ICI BOILERS

Revised emissions presented in Tables 1a, 1b, 3a, and 3b for Control Measure ICI2 (OTB plus likely control for sources subject to BART) using the latest version of LADCO's 12/29/05 "List of Sources Possibly Subject to BART".

PETROLEUM REFINERIES

Corrected the emissions for all refineries in Illinois to reflect the latest LADCO inventory (Base K); made editorial comments and corrections suggested by Bob Elvert of ExxonMobil.

CEMENT KILNS

Changed Table 2 to reflect current BART status base on latest version of LADCO's 12/29/05 "List of Sources Possibly Subject to BART". Revised emissions presented in Tables 1 and 3 for Control Measure KILN2 (Apply likely control to kilns subject to BART) using the latest version of LADCO's 12/29/05 "List of Sources Possibly Subject to BART".

ARCHITECTURAL AND INDUSTRIAL MAINTENANCE COATINGS

Changed emissions in Tables 1 and 3 per Grant Hetherington comment that there should be no reductions for traffic markings in WI since the control measure is based on WI NR 422.17 which is already in place in WI.

Added a paragraph to the end of the regulatory history to give an update on CARB's future revisions AIM suggested control measure. *"CARB is in the process of updating the 2000 Suggested Control Measure (SCM) for Architectural Coatings. They are currently completing a 2004 survey of AIM coating usage and VOC contents. They will not begin the formal SCM update process until the survey is completed, and are expected to propose revisions to the SCM in mid to late 2007. It cannot be determined at this time whether CARB's updated SCM will be as stringent as the SCAQMD Phase III limits."*

CONSUMER PRODUCTS

Slightly changed Regulatory History paragraph on CARB 2003 SIP requirements to indicate that CARB expects to adopt the second phase of the amendments (CONS-2) by the end of 2006.

AUTO REFINISH COATINGS

Changed emissions in Tables 1, 2, and 3 per Grant Hetherington, who pointed out an error in which counties in Wisconsin were considered adjacent and not adjacent to nonattainment areas. The 3/28/2005 version used an older version of the county lookup table and was not updated (as the other White Papers were) to reflected the updated adjacent/not adjacent classifications.

Added a paragraph to the end of the regulatory history to indicated that CARB has a new automotive coating suggested control measure and that SCAQMD 1151 was recently updated to be consistent with the SCM. *"SCAQMD updated their rules in December 2005 based on CARB's October 2005 Proposed Suggested Control Measure (SCM) for automotive coatings."*

Revised cost-effectiveness information based on CARB's 2005 Suggested Control Measure analysis.

Added a reference for the CARB 2005 Suggest Control Measure staff report.

PORTABLE FUEL CONTAINERS

Changed the Regulatory History section to provide an update on the CARB rules, which were amended on September 15, 2005, to add requirements for kerosene and utility jugs and other changes to improve effectiveness of the container design.

Change the Regulatory History and Rule Development sections to provide an update on EPA's proposed national rules. *"On February 28, 2006, EPA proposed a national regulation to reduce hazardous air pollutant emissions from mobile sources. Included in the proposed rules are standards that would reduce hydrocarbon emissions PFCs from evaporation, permeation, and spillage. The proposed EPA program is very similar to the revised California program. Although a few aspects of the program are different, EPA believes manufacturers would be able to meet both EPA and California requirements with the same gas can designs. Since the proposed EPA requirements would not go into effect in 2009 and there will be 5-10 year period for the new containers to penetrate the market, only a very small reduction in VOC emissions is expected in 2009."*

ASPHALT PAVING

Changed emission reductions to correct calculation error as pointed out by Grant Hetherington. The documentation says 40% reduction from emulsified asphalt, but error in spreadsheet only took 37.5% reduction. Tables 1 and 2 changed accordingly.

GASOLINE DISTRIBUTION FACILITIES

Changed Stage II emissions in 9 WI counties based on Grant Hetherington comment: "For Kewaunee, Kenosha, Manitowoc, Sheboygan, Washington, Ozaukee, Waukesha, Milwaukee and Racine counties, the current CE, RE and RP values achieved by existing Stage II systems are comparable to those achieved by the new EVR Stage II systems. Consequently, there is no benefit to moving to EVR Stage II in the 9-counties."

Changed Stage I emissions in 20 WI counties based on Grant Hetherington comment: "For stage I emissions in the 20 NAA and adjacent counties, I'm using CE=97.39, RE=98 and RP=98. The revised emissions are in the attached spreadsheet." Revised Tables 1 and 2 accordingly.

INDUSTRIAL SURFACE COATING

Added area source emissions for SCC=24-01-090-000 Misc. Manufacturing to emission tables as these emissions were inadvertently left out (per comment from Grant Hetherington).

Bill Juris of Ohio EPA suggested that the area source emissions in the White Paper should be changed to reflect the final 2002 NEI which he says "will most likely include VOC emission estimates based upon the methodology developed in the draft EPA report "'Solvent Mass Balance' Approach for Estimating VOC Emissions From Eleven Nonpoint Solvent Source Categories" (March 28, 2005). " I downloaded the final NEI 2002 and the area source VOC emissions for surface coating are virtually identical to what is in the White Paper.

Bill Juris of Ohio EPA recommended doing a separate White Paper on printing/graphic arts, which is a separate category and not included in the surface coating category.

Bill Juris of Ohio EPA made several technical clarifications and corrections which were incorporated into the White Paper.

SOLVENT CLEANING (DEGREASING)

Grant Hetherington pointed out that we were taking reductions from the electronics sector which are specifically excluded from the OTC model rule and Chicago area Cold Cleaning RACT regulations. Changed calculations to exclude electronics and revised 1 and 3 with revised emission reduction estimates.

Bill Juris's comments indicate that Maryland and the OTC overestimated by 50% the reductions achievable from their model rule. His argument seems to make sense, but I don't think we should change the White Paper until a more detailed analysis can be done and we get a better handle on what the actual emissions are (see following comment).

He also comments the area source emissions in the White Paper are too high and should be changed to reflect the final 2002 NEI which he says "the methodology for estimating 2002 emissions may be outdated as shown in the draft EPA report "'Solvent Mass Balance' Approach for Estimating VOC Emissions From Eleven Nonpoint Solvent Source Categories" (March 28, 2005). In that "solvent mass balance" report, the 2002 VOC emissions from surface cleaning for Ohio are shown as 7,402 tons...the 2002 VOC emissions for Ohio in the White Paper are shown as 17,877 tons" I downloaded the final NEI 2002 and the area source VOC emissions for degreasing are identical to what is in the White Paper, so it doesn't look like EPA decided to use "solvent mass balance" approach.

II. Other Changes: Electric Generating Units (December 8, 2005)

Comments Received From Stakeholders on EGU White Paper

Date	Organization and Reference
March 8, 2005	Environmental Committee of the Ohio Electric Utilities, <i>Comments on Interim White Paper – Source Category: Electric Generating Units</i>
March 9, 2005	Midwest Ozone Group and Utility Air Regulatory Group, <i>Comments on Emissions Standards, Schedule Proposed in Interim White Paper</i>
March 9, 2005	Center for Energy & Economic Development, <i>Age and Size of Coal Power Plants</i>
May 2005	United Mine Workers of America, <i>Comments of United Mine Workers of America on Proposed LADCO EGU White Paper</i>
July 5, 2005	United Mine Workers of America, <i>Comments of United Mine Workers of America on Proposed Amended Rules for Fossil-Fired Powerplants 28 IR 2817</i>
July 11, 2005	BBC on behalf of CEED, MOG, and NiSource, <i>Impacts of LADCO CAIR-Plus Proposals on the Midwest Economy</i>
July 27, 2005	American Electric Power, <i>Electric Generating Unit White Paper</i>
July 29, 2005	Cinergy Corp., <i>Comments on Interim White Paper- Source Category: Electric Generating Units</i>
August 1, 2005	Midwest Generation EME, <i>Midwest Generation's Comments on the EGU Interim White Paper dated 1/14/05</i>
August 1, 2005	Midwest Ozone Group, <i>Evaluation of the Midwest RPO Interim Measures and EGU1 and EGU2</i>
August 1, 2005	Midwest Ozone Group and Utility Air Regulatory Group, <i>Comparison of EGU1 and EGU2 to Consent Decrees and BACT Limits</i>

August 2, 2005	Office of Public Utilities, City of Springfield IL, <i>Comments on Interim White Paper, Midwest RPO Candidate Control Measures, Source Category: Electric Generating Units</i>
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Comments Addressed in this Revision

Comment: Update regulatory section (e.g., reflect final CAIR and BART rules)

Response: MACTEC updated Tables 1 and 2 to use the results from the latest round of RPO IPM modeling reflecting the requirements of the final CAIR rule as well as updates to the input EGU inventory. No changes to the EGU1 and EGU2 levels of control were made. MACTEC expanded Tables 1 and 2 to show ozone season emissions for NOx, since the final CAIR specifies ozone season NOx emission budgets. We revised the description of the “On-the-Way Regulations” to reflect the provisions of the final CAIR and CAMR rules.

Comment: The discussion of allocating CAIR SO2 allowances in incorrect (i.e., SO2 allocations are set by the 1990 CAA, not CAIR) middle of page 7 in 1/14/2005 version.

Response: This paragraph was rewritten to accurately describe the CAIR cap-and-trade program.

Comment: Projected emissions (based on IPM) may not be accurate (e.g., size of allowance banks flawed, and assumptions about which plants will install pollution equipment does not match reality)

Response: MACTEC updated Tables 1 and 2 to use the results from the latest round of RPO IPM modeling reflecting the requirements of the final CAIR rule as well as updates to the input EGU inventory. Any projections of which plants will install pollution equipment have some uncertainty – IPM is generally considered to be the best available analytical tool for making those projections.

Comment: Need to clarify whether the NOx emission caps are on an annual basis, and address the implications of maintaining the summer ozone season CAIR NOx emission cap.

Response: Tables 1 and 2 were updated to show the ozone season NOx emissions in 2002, projected emissions under the CAIR, and projected emissions under EGU1 and EGU2. For now, the NOx emission caps for the ozone season were calculated using the same EGU1 and EGU2 lbs/mmBtu values as for the annual case (i.e., “retrofit BACT levels” of 0.15 lbs/mmBtu for SO2 and 0.10 lbs/mmBtu for NOx, to be fully implemented by 2013; “BACT levels for new plants” of 0.10 lbs/mmBtu for SO2 and 0.07 lbs/mmBtu for NOx, to be fully implemented by 2013.)

Comments to be Addressed at a Later Date

Comment: The BBC study, commissioned by CEED, MOG, and NiSource shows:

- Electric rates would increase regionally by 11% (EGU1), 16% (EGU2)
- Demand for IL,IN,OH coal would decrease by 48% (EGU1), 54% EGU2)
- Economic output would decrease regionally by \$7-10 billion (EGU1), \$9-14 billion (EGU2)
- Employment in the region would decline by 50-70K jobs (EGU1), 70-95K (EGU2)

Comment: The Marchetti study, commissioned by MOG, shows:

- Retirement of 10.6 and 34.9 GW, respectively, of coal-fired capacity
- Increased annualized compliance costs (10x greater than those for CAIR)
- Displacement of 42.6-47.8 M tons of IL, IN, OH coal with natural gas, PRB coal
- Emission caps cannot be achieved even with aggressive application of FGDs, SCRs

Response: The emission caps assumed in the Marchetti and BBC studies are more stringent than those identified for EGU1 and EGU2 in the White Paper. A more complete benefit-cost study based on the correct EGU1 and EGU2 is currently being performed for LADCO.

Comment: Remarks on appropriate combination (and amount) of local and regional controls needed to provide for attainment of NAAQS and meet regional haze goals:

- Supports CAIR as a basis for regional controls.
- A wider range of EGU reductions should be considered.
- If the States continue to pursue beyond-CAIR reductions from EGUs, then consideration should be given exempting those utilities that will already have coal-fired units equipped with FGDs and SCRs.
- The States should consider a balance between local and regional controls; in particular local reductions for nonEGU and mobile sources (e.g., EPA's ozone source apportionment modeling shows that nonroad, on-road, and nonEGU sources are the main contributors to ozone in Chicago)
- Source apportionment modeling shows that local controls of area and mobile sources are more important to achieve attainment. MRPO should support states in more localized control strategies.
- Nonattainment is a local problem and reductions should come from all sources within the nonattainment area.
- EGU1, EGU2 will not significantly aid individual states in developing their SIPs for ozone or PM2.5.
- Even if the control options are technically achievable, they should be disregarded if they do not make a meaningful difference in achieving attainment.

Comment: BACT is not an appropriate level of control to be considered for the universe of EGUs across the 5-state region. Furthermore, the amount of SO₂ reduction needed to achieve the EGU1 and EGU2 limits of 0.15 and 0.10 lb/MMBTU for the high sulfur coals in IL, IN, and OH is on the order of 96-98%, which is unachievable across the universe of power plants of diverse capacity, age, retrofit difficult, and thermal efficiency. An emission limit of 0.35 lb/MMBTU would allow nearly all IL, IN, and OH coals to be used at an assumed 95% FGD control efficiency. EGU1 and EGU2 limits would necessitate fuel switching and discriminate against the use of local coal resources. Assumption that every retrofit can meet a high level of reduction (95-98 percent removal) is incorrect.

Comment: EGU1, EGU2 will result in replacing the use of local (IL) coal with a lower sulfur coals supply, which is not a prudent policy.

Comment: The following additional information should be included in the White Paper:

- MW hours of electricity produced by coal-fired units in comparison to other generation sources in the Midwest.
- Number of existing control equipment that might need to be upgraded, the upgrade costs, and the time needed to implement the upgrades.

Comment: The control measures in the STAPPA/ALAPCO have not been analyzed for feasibility or cost.

Comment: Need to conduct more comprehensive study of key risk factors and rigorous analysis of what can be realistically accomplished by specific deadlines and what the costs will be.

Comment: Extrapolation of cost effectiveness information from USEPA's CAIR analysis is inappropriate. Marginal costs in a smaller region (i.e., 5-state LADCO region) will be higher than those in a larger 28-state region. An analysis of cost should be conducted for the 5-state region using the most accurate economic assumptions. Other cost metrics, beside \$ per ton, should be considered.

Comment: In comparison to recent consent decrees and BACT determinations, EGU1 and EGU2:

- Are extremely aggressive targets.
- Are more stringent than NSPS.
- Will require universal deployment of SCRs for NO_x (EGU2), which may not be possible on all existing units and may force retirement for certain smaller, older units (thereby, posing reliability problems). Furthermore, maintaining high levels of control for 12 months with SCR equipment is unproven.
- Will require retrofit of FGD for SO₂ on most units, which may force retirement for certain smaller, older units (thereby, posing reliability problems)

Comment: The derivation of EGU1, EGU2 emission caps is overly simplistic and unrealistic:

- Ignores unit design, operation, fuel handling, and other site-specific factors
- Arbitrarily uses only 2001 heat input, rather than a range of years or future year growth.
- Interim caps not supported by appropriate technical analyses.
- Need to consult with appropriate state agencies, such as utility transmission and planning regulators.

Comment: The White Paper should address implementation of EGU1 and EGU2, including the interaction with the CAIR trading program, and use of the existing bank of SO₂ allowances.

Comment: Need to address how state-specific mercury reduction requirements, which are more stringent than CAMR, impact SO₂ and NO_x reductions.

Comment: Miscellaneous Comments:

- Use of ICAC's position, without consideration of utility industry's opposing comments filed under CAIR undermines the credibility of the W.P.
- The estimated NO_x reduction costs (\$700-2,100 per ton) are well below the current allowance market price of \$3,000-4,500 per ton.
- In "Candidate Control Measures", only the Emission Control Technologies item is relevant.
- Unreasonable to assume that any modeled control strategy that goes beyond the NO_x SIP call and CAIR will be adopted by all the states in a timely manner.
- If EGU1, EGU2 are to be modeled in IPM, then the IPM assumptions should be documented and made available for review and comment.

III. Other Changes : Industrial, Commercial, Institutional (ICI) Boilers (December 6, 2005)

Commenter: Citizens Thermal Energy, *Comments Regarding "Interim White Paper – Midwest RPO Candidate Control Measures: Source Category ICI Boilers (03/29/05)"*, July 29, 2005.

Comment #1: Comments Regarding Source Category Description: (a) ICI Boilers utilize a variety of fuels, (b) Most ICI Boiler designs cannot accommodate wholesale fuel switching with ease, (c) Consideration should be made to the CFB boiler technology by acknowledging its significant environmental benefits, (d) Table 2 must be improved – it is an "interesting first pass at characterizing the population of Midwest ICI boilers", but is "wholly inadequate as a base for regulatory assessment." .

Response to (1a): MACTEC has added a new table showing emissions by fuel type and an expanded discussion in the "Source Category Description" section to illustrate the variety of fuels used and emissions generated by fuel type. MACTEC also referred readers to new References 8 and, the Energy and Environmental Analysis report *Characterization of the U.S. Industrial/Commercial Boiler Population* and the Oak Ridge National Laboratory report *Guide to Low-Emission Boiler and Combustion Equipment Selection*, which provide a more detailed description the diversity of the ICI boiler population.

Response to (1b): MACTEC added a sentence in the "Source Category Description" to indicate that most boilers are design to combust specific fuels and that switching fuels may decrease capacity or efficiency.

Response to (1c): MACTEC added a sentence in the "Source Category Description" to describe CFB boilers.

Response to (1d): MACTEC added Table 2b to show emissions by fuel type. We are continuing to work with States and industry in improving the ICI boiler database to account for differences in boiler size, design, and fuel type.

Comment #2: Comments Regarding Regulatory History: (1) Reflect final CAIR and BART rules and (2) take into account current unit level reductions from NOx SIP Call and consent orders.

Response to (2a): MACTEC revised the discussion to reflect final CAIR and BART rules.

Response to (2b): As shown in Table 3a of the 3/29/05 versions of the White Paper, emission from the NOx SIP call were accounted for. We reviewed enforcement settlements for the refining and ethanol industries and accounted for these reductions in the "on-the-books" scenarios. We also identified plans for scrubbers at the Alcoa Warrick facility that will result in large reductions from this unique facility. Information on existing controls was collected from the states to better characterize the controls already in place for MRPO ICI boilers. The emissions shown in all of the tables were recalculated using this new information. We are continuing to work on improving the ICI boiler database to account for existing controls.

Comment #3: Comments Regarding Candidate Control Measures: control assumptions based on BART-eligible units are not applicable for all other units, emerging technologies have only been tested for a limited number of boiler types/sizes and may not scale down to the ICI boiler category, SCR for NOx has limited applicability to the ICI boiler category.

Response to #3: MACTEC is continuing to investigate whether data exists to develop more specific candidate control measures based on fuel type, size, and boiler design. For the Ozone Transport Commission, we are currently conducting a benchmarking study to better characterize emission controls for different boiler designs and fuel types. EPA is also working to improve its inventory of emissions and control cost information for non-EGU boilers. Results of these efforts may be incorporated in future versions of the White Paper to provide more specific emission reduction and cost-effectiveness estimates based on boiler type, size, and fuel type.

Comment #4: Comments Regarding Cost Effectiveness and Basis: cost-effectiveness does not account for the complexity of the ICI boiler population, candidate control measures are real options for only a few ICI boilers, must fully consider impact on non-traditional fuels.

Response to #4: See Response to #3.

Comment #5: Comments Regarding Timing of Implementation: Any future control program should be coordinated with the ICI boiler MACT standard, and should only require reductions that are cost-effective.

Response to #5: This issue will be addressed separately by the States at a later date.

IV: Other Changes: Cement Kilns (December 15, 2005)

Commenter: Portland Cement Association, *Comments on the Midwest Regional Planning Organization's Engineering Analysis on Cement Best Available Retrofit Technology (BART) and Interim White Paper - Midwest RPO Candidate Control Measures, Source Category: Cement Kilns*", October 7, 2005.

Comment #1: The assessment of low-NO_x burner technology assumes an extremely aggressive control efficiency and fails to include certain costs.

Response to #1: The performance and cost information for low-NO_x burners in the White Paper came directly from EPA's *NO_x Control Technologies for the Cement Industry*, September 19, 2000. Attachment 1 of the White Paper lists a range of \$300 to \$1200/ton for low-NO_x burners, which came from Table 6-19 of the EPA document, which was based on an average 25% NO_x reduction, which is in the middle of the range of the 4-47% NO_x reduction quoted in the White Paper. These estimates represent average costs that might be expected for a typical kiln.

Comment #2: The assessment of SCR technology assumes an unsupported control efficiency and fails to include certain costs. Furthermore, the application of SCRs to cement kilns is extremely limited. The commenter disagreed that SCR technology is a reasonably available technology for controlling NO_x emissions.

Response to #2: After reviewing available literature, we agree that SCR technology has limited applicability and is not likely to be considered reasonably available or BART. However, as the commenter points out, "other more established NO_x-control technologies are capable of achieving the emission rates that are currently attained by the sole plant currently utilizing SCR...these other technologies are significantly less expensive to install and operate". For example, European Commission, Integrated Pollution Prevention and Control (IPPC) Bureau's *Reference Document on Best Available Techniques in the Cement and Lime Manufacturing*

Industries indicates that two plants in Europe are achieving reduction rates of 80-85% using SNCR technologies. MACTEC made changes to the White Paper to indicate that SCR is not applicable, but retained the 80% reduction percentage as BART based on the experience of the two European plants that utilize SNCR.

Comment #3: Several problems were noted with respect to the cost estimates, including use of an inappropriate interest rate; lack of cost calculations for mid-kiln firing, SNCR, and change in feed material; lack of data to support purchased equipment costs; failure to include certain costs associate with FGC systems; and inclusion of a "tipping fee" in the cost effectiveness calculations.

Response to #3: Cost estimates for NO_x controls in the White Paper came directly from EPA's *NO_x Control Technologies for the Cement Industry*, September 19, 2000. Chapter 6 of that document provides detailed cost calculations for low-NO_x burners, mid-kiln firing, SNCR, and SCR.

Comment #4: The White Paper fails to address site-specific considerations, such as space availability and other regulatory factors.

Response to #4: These factors are very site-specific and cannot be addressed in this preliminary discussion of candidate control measures. These factors will be addressed at a later time by the States.

Comment #5: The White Paper incorrectly states that there are no existing controls for SO₂ or NO_x. Many cement kilns are subject to the NO_x SIP Call and some are subject to NO_x RACT.

Response to #5: The emission inventory database that MACTEC is using lacked data on existing controls at cement kilns. This is a gap in the inventory database. To fill this gap, we asked each state to identify the existing controls at each cement kiln. The White Paper acknowledges in several places (Table 1, the discussion of the NO_x SIP call on page 3, Table 2, and Table 3) that emission reductions from 2002 levels based on controls installed to comply with the NO_x SIP call requirements. No state identified any existing SO₂ controls.

Comment #6: Several problems were noted with respect to the assumed control technologies, including lack of data to support the assertion that advanced FGD is technically feasible, and lack of support for the assumed wet FGD control efficiencies.

Response to #6: We agree that the advanced FGD system referenced (the Passamaquoddy scrubber system) was a DOE demonstration project and it is questionable whether it is technically feasible. MACTEC changed the White Paper to use a wet FGD system for both candidate control measures *KILN1* and *KILN2*, using a 90% SO₂ reduction for the wet FGD system. The European Commission, Integrated Pollution Prevention and Control (IPPC) Bureau's *Reference Document on Best Available Techniques in the Cement and Lime Manufacturing Industries* indicates that wet scrubbers have achieved SO₂ reductions of more than 90 percent at plants in Europe.

V: Other Changes: Consumer and Commercial Products (December 1, 2005)

Commenter: Consumer Specialty Products Association, *Comments on Interim White Paper – Source Category: Consumer and Commercial Products*, July 29, 2005.

Commenter: Automotive Specialty Products Alliance, *Comments on Interim White Paper on Consumer and Commercial Products*, August 1, 2005.

Commenter: Cosmetic, Toiletry, and Fragrance Association, *Interim White Paper – Possible Regulation of Consumer Products*, August 1, 2005.

Comment: Stakeholders support uniform and consistent regulations throughout the 5-State MRPO Region.

Response: MRPO states recognize the need to uniformity and consistency.

Comment: Adoption of Future CARB Regulations in the Midwest is Cost Prohibitive.

Response: This comment will be addressed separately by the MRPO states at a later date.

Comment: Costs to implement CARB regulation CONS-1 are underestimated (i.e., cost-effectiveness is in the \$12-20/pound (\$24,000-41,560/ton) range, not the \$2.40/pound (\$4,800/ton) estimate listed in the White Paper.

Response: The \$4,800/ton value quoted in the White Paper came from page VIII-175 of the CARB's *Initial Statement of Reasons for the Proposed Amendments to the California Aerosol Coating Products, Antiperspirants and Deodorants, and Consumer Product Regulations (May 7, 2004)*. During the CARB rulemaking process, stakeholders commented that CARB's analysis underestimates by more than a factor of ten the actual costs attributable to the proposed rule. In the *Final Statement of Reasons for Rulemaking, Including Summary of Comments and Agency Responses (June 13, 2005)*, CARB responded to this comment by saying "Staff does not agree that the costs of the proposed amendments were underestimated...The methodologies employed were also the same or very similar to those in other consumer products rulemakings. Staff has many years of experience in conducting these analyses, and this experience indicates that accurate cost estimates have resulted from these methodologies in the past."

Comment: Sell-Through Limitation Provisions are not necessary

Response: We included a discussion of the sell-through provision since it provided "a window during which manufacturers and distributors may continue to sell products that were produced before a set deadline even if they do not meet the more stringent VOC limits. The sell-through period is simply a safeguard to prevent compliance action for occasional older products remaining on retail shelves." Commenters believe it is more of a record-keeping burden than a safeguard. Since the OTC model rule does not include a sell-through provision, we revised the White Paper to reflect the comment that a sell-through period is not necessary.

Comment: Miscalculation (underestimation) of Emission Reduction Credits. Commenters take issue with White Paper assertion that "According to EPA, VOC emissions from those 24 product categories are reduced by 20 percent. But since over half of the inventory is unaffected by the rule, the Federal rule is estimated to yield VOC reductions of 9.7 percent from uncontrolled levels for the entire consumer and commercial production category." Commenters suggest that a 20 percent credit should be used as stated in Seitz 1995 memo *Regulatory Schedule for Consumer and Commercial Products under Section 183(e) of the Clean Air Act*.

Response: First, the 9.7 percent value on page one is a typo – it should read 8.0 percent, which is the value shown and used in Table 2 to represent the overall reduction from Federal Part 59 Rule.

The reference for the 8.0 percent reduction is page 36 of LADCO's *Development of Growth and Control Factors for Lake Michigan Air Directors Consortium*. The uncontrolled per capita factor listed in the LADCO report is 7.79 lbs/person, while the controlled factor after Part 59 is 7.17 lbs/person, which is a reduction of 7.96 percent. The LADCO report states that "these values are consistent with those used by EPA to compute 2002 national emission estimates for this source category". It also similar to the reductions estimated in the OTC's *Control Measure Development Support Analysis of Ozone Transport Commission Model Rules*. The uncontrolled per capita factor listed in the OTC report is 7.84 lbs/person, while the controlled factor after Part 59 is 7.06 lbs/person, which is a reduction of 0.8 lbs/person or 9.9 percent. These values are also consistent with the Seitz memo which states that "a 20 percent reduction would be approximately 0.8 pounds per capita annually". As shown in the table on page 7 of the White Paper, we are using the 20 percent reduction for the control efficiency, but multiplying it by the rule penetration (the percentage of products affected by the rule). We believe that the 20 percent reduction quoted in the Seitz memo only applies to those categories affected by the Federal Part 59, not to all products, and that the emissions reductions from the Part 59 rule quoted in the White Paper are correct.

Comment: MRPO states should provide a reasonable future effective date for any new VOC standards. Commenter suggests that a compliance date of Jan. 1 2009 is appropriate if States promulgated final regulations in 2006-2007.

Response: This comment will be addressed separately by the MRPO states at a later date.

Comment: CSPA Strongly Supports the Inclusion of Necessary Regulatory Flexibility Provisions like the Innovative Product and Alternative Control Plan.

Response: We modified the White Paper to note that these provisions exist in the OTC model rules and should be considered by MRPO states during regulatory development.

Comment: States should consider a voluntary program based on the OTC standards and consult with EPA about obtaining SIP credit for emission reductions that are not mandatory.

Response: This comment will be addressed separately by the MRPO states at a later date.

VI: Other Changes: AIM Coatings (December 1, 2005)

Commenter: National Paint and Coatings Association, *Comments on Architectural and Industrial Maintenance (AIM) and Industrial Surface Coatings*, August 1, 2005.

Commenter: National Paint and Coatings Association, *Comments on Midwest Region Planning Organization (MRPO) Identification and Evaluation of Candidate Control Measures (April 14, 2005 Version) Architectural and Industrial Maintenance Coatings*, November 22, 2005.

Comment: Accuracy of the Emission Estimates – emissions should track closely to state population since emissions are based on per capita factors.

The emission estimates in the White Paper (and in the slides from the AIM presentation on June 29, 2005) came from the EPA's 2002 Draft NEI. For architectural coatings, one would expect the emissions to be directly proportional to population since the emissions are per capita-based and there are no differences in the regulatory requirements among the five states. There seems to be different emission factors used by the states for this category – the 2002 Draft NEI has an

emission factor of 3.94 lbs/person for IL, 3.22 lbs/person for IN, and 3.12 lbs/person for WI (emission factors were not reported for MI or OH).

To address the inconsistency in emission factors, MACTEC recalculated the emissions for solvent-based architectural coatings, water-based architectural coatings, industrial maintenance coatings, and special purpose coatings using the latest emission factors from EPA's *Documentation for the Draft 2002 Nonpoint Source National Emission Inventory for Criteria and Hazardous Air Pollutants (March 2005 Version)*. The factors are 1.609 lbs/person for solvent-based architectural coatings, 1.513 lbs/person for water-based coatings, 0.64 lbs/person for industrial maintenance coatings, and 0.64 lbs/person for special purpose coatings. These emission factors reflect the impact of the Part 59 AIM rules.

It should be noted that EPA, states, and stakeholders are currently reviewing the emission calculation procedures for AIM coatings, both in terms of the baseline emission levels (with and without Part 59) as well as the emission reductions from the OTC Model Rule (See Federal Register notice dated August 31 entitled *Advance Notice to Solicit Comments, Data, and Information for Determining the Emission Reductions Achieved in Ozone Nonattainment Areas from the Implementation of Rules Limiting the VOC Content of AIM Coatings*). In this notice, the EPA is encouraging all interested parties to submit information on how to best calculate the VOC emission reductions from the adoption of AIM coating rules. We recommend that the MRPO track the results of EPA's analysis to better quantify the baseline emission levels and reductions attributable to the OTC Model Rule.

Comment: Support the use of up-to-date references.

As mentioned above, the procedures for calculating baseline emissions and reductions from the OTC Model Rule are currently being reevaluated. In addition to the Region III analysis, EPA's OAQPS has an on-going study to evaluate emissions from architectural coatings and other solvent categories, resulting in a draft report "*Solvent Mass Balance*" *Approach for Estimating VOC Emissions from Eleven Nonpoint Solvent Source Categories (March 28, 2005)*. As this is a draft report that cannot be cited, we recommend that the MRPO track the results of OAQPS's analysis to better quantify the baseline emission levels and reductions attributable to candidate control measures.

The issues of reactivity is also the subject of ongoing studies. For example, EPA's September 1, 2005, *Interim Guidance on Control of VOC in Ozone State Implementation Plans*, which encourages states to consider recent scientific information on the photochemical reactivity of VOC in the development of SIPs. The interim guidance summarizes recent scientific findings, provides examples of innovative VOC control measures, and clarifies EPA innovative reactivity based policies. CARB is also conducting on-going studies of reactivity-based control measures. We recommend that the MRPO track these on-going studies of reactivity-based control measures.

Comment: AIM Coatings Control vs. Other Control Measures. Commenter suggests that other categories offer much greater cost effective reductions – these include nonroad vehicles, highway vehicles, and industrial processes.

This comment will be addressed separately by the MRPO states.

Comment: Numerous concerns with South Coast Rule 1113 were identified, including: 1. Phase III limits have not been implemented 2. Coatings formulated for southern CA will not work in the upper Midwest 3. CARB is still conducting several projects 4. CARB is working

on revisions to its suggested control measure 5. EPA's ANPR on AIM coatings will raise issues that need to be resolved

This comment will be addressed separately by the MRPO states.

VII: Other Changes: Industrial Surface Coating (November 29, 2005)

Commenter: Michigan Manufacturers Association, *Comments on Midwest Planning Organization (RPO) Identification and Evaluation of Candidate Control Measures and Associated "White Papers"*, September 27, 2005.

Comment: With regard to auto assembly plants, the document is out of date by 10-15 years with regard to common coating practices and doesn't reflect the many have converted to low VOC coatings and have some level of add-on controls already.

Response: MACTEC added a paragraph to the "Source Category Description" section to indicate that some industries have implemented "low emission paint systems" over the past 10-15 years to meet regulatory requirements or pollution prevention goals.

The White Paper does reflect that surface coating emissions are already significantly controlled. The second bullet on page 3 indicated that "many point sources are already controlled or soon will be controlled as a result of recently promulgated MACT standards". Table 3 shows that VOC emissions have already been reduced by an average of 78% across all surface coating categories, and will be reduced by an average of 84% from uncontrolled after implementation of MACT standards. For the Autos and Light Truck Category, Table 3 shows that uncontrolled emissions will be reduced by an average of 65% after implementation of the MACT standard.

Comment: Table 1a costs are inaccurate (i.e., not representative of the difficulty and cost of controlling auto coating lines with low concentration, high volume streams).

Response: MACTEC changed Table 1a and the "Cost Effectiveness and Basis" section to reflect the fact that controlling a low concentration waste stream will be much more expensive than cleaning a high pollutant load flow. We added Reference 8 to the White Paper which states that the cost effectiveness for regenerative thermal oxidizers may range up to \$21,000 per ton when a control device is used for very low-VOC concentration streams (less than around 100 ppmv) at very low flow rates.

Comment: Inclusion of emissions from attainment counties in Table 1a is inappropriate (i.e., only emissions from nonattainment counties should be included).

Response: At the requests of the states, MACTEC prepared Table 4 in the White Paper to show estimated emission reductions obtainable from nonattainment counties only, attainment counties adjacent to nonattainment areas, and all other attainment counties. This was done to allow states to evaluate policy options for geographic coverage of control measures.

Comment: Should not assume overall control of 90% for industrial surface coating as it may not be technically feasible or cost effective. Instead, there should be an examination of each source in a representative modern facility, with a rigorous analysis of retrofit costs, operating costs, and effectiveness before presenting prospective reduction figures.

Response: The purpose of the White Paper is to identify an initial set of possible control measures that may be considered in more detail in the future, with a “ballpark” estimate of the types of reductions that may be expected. The 90% reduction from uncontrolled was assumed based on the fact that many (but certainly not all) surface coating sources can achieve 98+% using 100% capture systems and add-on control equipment; for other sources this high level of control may not be technically feasible or cost effective. Conducting a rigorous analysis of cost and effectiveness for each of the many types of surface coating operations was beyond the scope of work for this initial identification of possible control measures. States will need to conduct this type of rigorous analysis to determine the level of stringency for control measures selected for further consideration.

Comment: The White Paper does not address the serious issue of catalyst poisoning and blinding.

Response: We recognize that pretreatment to remove PM may be needed for certain types of coating operations and control systems to prevent catalyst poisoning or blinding. These issues will need to be considered if and when States conduct rigorous analyses to determine the level of stringency for control measures for specific types of coating operations.

Additional Changes

E.H. Pechan and Associates re-evaluated the potential VOC emission reductions that may be achieved through the implementation of the post-2002 MACT surface coating standards. For four categories (large appliances, metal furniture, plastic parts, and miscellaneous metal parts), Pechan determined that there will not be any additional VOC reductions as a result of post-2002 MACT implementation. Tables 1a, 3, and 4 have been modified to reflect this change.

VIII: Other Changes: Gasoline Distribution Facilities (November 29, 2005)

Commenter: Michigan Manufacturers Association, *Comments on Midwest Planning Organization (RPO) Identification and Evaluation of Candidate Control Measures and Associated “White Papers”*, September 27, 2005.

Comment: April 8, 2005 version of White Paper references CARB’s 2000 Initial Statement of Reasons report that was subsequently been updated in 2002. CARB’s revised analysis indicated that costs identified in the 2000 report were off (low) by a factor of three.

Response: MACTEC obtained and reviewed the more recent CARB reference document (*Staff Report: Enhanced Vapor Recovery Technology Review*, October 2002). On page 43 of the 2002 Staff Report, CARB states: .

“The EVR technical review modifications to the cost analysis are reflected in the cost-effectiveness values in the bottom row of the table. The cost-effectiveness values have increased by about a factor of three. The main reason is correction of the calculation error discussed in the previous section regarding distribution of the equipment costs over the 4-year phase-in period.”

MACTEC changed Table 1a, Table 1b, and the “Cost Effectiveness and Basis” section of the White Paper to provide CARB’s most recent cost information.

Comment: The White Paper fails to point out that the CARB program is still a work in progress and CARB is still trying to make the program work.

Response: MACTEC reviewed information on CARB’s web site <http://www.arb.ca.gov/vapor/vapor.htm> which contained information indicating that there have been several delays in implementing the EVR program as systems to meet all of the EVR standards are not yet commercially available. The EVR regulations became state law on April 1, 2001 and full implementation was expected within 4 years. The implementation dates have been extended several times because manufacturers needed additional time to design equipment to meet the standards. EVR is now being implemented over a period of eight years (full compliance in 2008) to allow time to develop and certify vapor recovery systems to the regulations’ technology-forcing standards, as well as to provide a four-year window for existing facilities to upgrade equipment to meet the new standards. MACTEC changed the “Regulatory History”, “Timing of Implementation”, and Tables 1a and Table 1b to reflect the technical problems CARB experienced implementing the EVR program and to add that the CARB EVR program has a 4-year window for existing facilities to comply with the requirements.