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## Source Category: Consumer and Commercial Products

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### INTRODUCTION

The purpose of this document is to provide a forum for public review and comment on the evaluation of candidate control measures that may be considered by the States in the Midwest Regional Planning Organization (MRPO) to develop strategies for ozone, PM<sub>2.5</sub>, and regional haze State Implementation Plans (SIPs). Additional emission reductions beyond those due to mandatory controls required by the Clean Air Act may be necessary to meet SIP requirements and to demonstrate attainment. This document provides background information on the mandatory control programs and on possible additional control measures.

The candidate control measures identified in this document represent an initial set of possible measures. The MRPO States have not yet determined which measures will be necessary to meet the requirements of the Clean Air Act. As such, the inclusion of a particular measure here should not be interpreted as a commitment or decision by any State to adopt that measure. Other measures will be examined in the near future. Subsequent versions of this document will likely be prepared for evaluation of additional potential control measures.

The evaluation of candidate control measures is presented in a series of "Interim White Papers." Each paper includes a title, summary table, description of the source category, brief regulatory history, discussion of candidate control measures, expected emission reductions, cost effectiveness and basis, timing for implementation, rule development issues, other issues, and a list of supporting references. Table 1 summarizes this information for the consumer and commercial products category.

### SOURCE CATEGORY DESCRIPTION

Consumer and commercial products are those items sold to retail customers for personal, household, or automotive use, along with the products marketed by wholesale distributors for use in commercial or institutional settings such as beauty shops, schools, and hospitals. Volatile organic compound (VOC) emissions from these products are the result of the evaporation of propellant and organic solvents during use. Consumer and commercial products include hundreds of individual products, including personal care products, household products, automotive aftermarket products, adhesives and sealants, FIFRA-related insecticides, coatings and related products (except architectural and maintenance coatings), and other miscellaneous products. Consumer and commercial products were estimated to account for about 5.9 percent of the total anthropogenic VOC emissions in the MRPO region in 2002.

### REGULATORY HISTORY

The U.S. Environmental Protection Agency (EPA) published the consumer and commercial products rule on September 11, 1998 (40 CFR Part 59 Subpart D) under authority of Section 183(e) of the Clean Air Act. This rule limits the VOC content of 24 product categories representing 48 percent of the consumer and commercial products inventory nationwide. 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

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**TABLE 1 – CONTROL MEASURE SUMMARY FOR  
CONSUMER AND COMMERCIAL PRODUCTS**

Control Measure Summary	VOC Emissions (tons/year) in 5-State MRPO Region	
<p><b>2002 existing measure: Federal Consumer and Commercial Products rules 40CFR Part 59</b>  <i>Emission Reductions:</i> Overall 8.0% from uncontrolled levels (20% reduction for products covered by rule, only 40% of all products are covered by the rule)  <i>Control Cost:</i> \$237 per ton  <i>Timing of Implementation:</i> Compliance required by December 1998  <i>Implementation Area:</i> Nationwide</p>	<p>Uncontrolled: 2002 Reduction: 2002 Base:</p>	<p>180,168 <u>-14,339</u> 165,829</p>
<p><b>Candidate measure: Adopt OTC Model Rule with additional product coverage and more stringent VOC limits</b>  <i>Measure ID:</i> SOLV2A  <i>Emission Reductions:</i> 14.2% beyond Federal Part 59 rule (for a total reduction of 21.0% from uncontrolled emissions)  <i>Control Cost:</i> \$800 per ton  <i>Timing of Implementation:</i> Assuming 2007 effective date of rule and 2-year sell-through period, emission reductions are achieved in 2009  <i>Implementation Area:</i> 5-state MRPO region</p>	<p>2002 Base:  2009 Reduction: 2009 Remaining:</p>	<p>165,829  <u>-23,548</u> 142,281</p>
<p><b>Candidate measure: Adopt CARB 2003 SIP requirements with additional products and more stringent VOC limits (in addition to OTC Model Rule)</b>  <i>Measure ID:</i> SOLV2B  <i>Emission Reductions:</i> 12.5% beyond OTC Model Rule (for a total reduction of 30.9% from uncontrolled emissions)  <i>Control Cost:</i> \$4,800 per ton  <i>Timing of Implementation:</i> Assuming 2007 effective date of rule and 2-year sell-through period, emission reductions are achieved in 2009  <i>Implementation Area:</i> 5-state MRPO region</p>	<p>2002 Base:  2009 Reduction: 2009 Remaining:</p>	<p>165,829  <u>-41,333</u> 124,496</p>

Notes: 2002 emission reductions shown are reductions from uncontrolled levels.  
2009 emission reductions shown are reductions for 2002 base emissions.  
2009 emissions are not growth-adjusted.

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entire consumer and commercial production category. All products listed in Part 59 and manufactured after December 10, 1998, must meet the VOC content limits.

The California Air Resources Board (CARB) has been regulating consumer and commercial products since 1989, when it adopted a regulation to reduce VOC emissions from antiperspirants and deodorants. In the early 1990s, amendments to the consumer products rule (referred to as the Phase I and Phase II amendments) required emission reductions for 26 additional consumer products. In 1995, CARB adopted an aerosol coatings regulation, which required emissions reductions from 35 categories of aerosol paints and related coatings products. In 1997 and 2000, the regulations were amended again to include so-called "mid-term" measures, so that the current regulations contain nearly 200 emission limits affecting 82 categories of consumer products, plus limits for 35 categories of aerosol coatings.

Also prior to passage of the Federal consumer and commercial rule, several other state and local agencies adopted rules to regulate various consumer and commercial products. For example, New York adopted rules for consumer insecticides, air fresheners, and disinfectants in 1988, and later adopted a regulation to limit the VOC content of antiperspirants, deodorants, and hair sprays. Seven other states also adopted some form of consumer product rules prior to the Federal rule.

Since over half of the inventory is unregulated by the Federal Part 59 rule, the Ozone Transport Commission (OTC) developed a model rule for consumer and commercial products in 2000 to regulate additional consumer product categories and have more stringent VOC content limits than the Federal rule. The VOC content limits in the OTC Model Rule are similar to the CARB's mid-term limits. The OTC Model Rule regulates approximately 80 consumer product categories and includes technologically feasible VOC content limits. According to Reference 3, the emission reductions for the OTC Model Rule are estimated to be 14.2 percent of the total consumer product inventory beyond the national rule reduction. Several states in the Ozone Transport Region are in the process of adopting the OTC Model Rule. All products manufactured for sale or use within an OTC State after January 1, 2005 would need to comply with the VOC content limits in the OTC Model Rule. The OTC Model Rule also includes regulatory flexibility provisions for innovative products and alternative control plans.

On October 23, 2003, CARB adopted a statewide SIP strategy to further reduce emissions from consumer products. The CARB committed to developing a measure to be implemented by 2006 that would achieve about a two percent reduction from consumer products. These rules were adopted on July 20, 2005. The CARB also committed to develop new consumer product category limits, with implementation between 2008 and 2010, which would achieve an additional 8-14 percent reduction from consumer productions by 2010. These rules, expected to be adopted by the end of 2006, will achieve reductions by setting mass-based and possibly reactivity-based standards.

None of the five Midwest RPO States have rules specifically regulating consumer and commercial products beyond the requirements of the Federal Part 59 rule.

## **CANDIDATE CONTROL MEASURES**

In general, VOC emission reductions can be obtained through product reformulation - modifying the current formulation of the coating to obtain a lower VOC content. The product reformulation options vary with each product category, and can involve one or more of the following approaches:

- Replacing VOC solvents with a water-based formulation;
- Replacing VOC solvents with acetone or another exempt solvent

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- Increasing the solids content of the product;
- Formulating a non-VOC propellant; and,
- Changing the valve, container, or delivery system to reduce VOC content.

The regulatory approach for reducing emissions is to establish VOC content limits for specific coatings that manufacturers are required to meet either through reformulating products or substituting products with compliant products. Two specific candidate control measures are discussed below.

*Measure SOLV2A – Adopt OTC Model Rule for Consumer Products.* This measure regulates more consumer products, establishes more stringent VOC limits than the Federal Part 59 rule, and achieves VOC emission reductions through the use of product reformulation and product substitution. The OTC limits are based primarily on the CARB mid-term limits adopted in 1997 and 2000. The emission reductions for the OTC Model Rule are estimated to be 14.2 percent beyond the reductions obtained from the Federal Part 59 rule.

*Measure SOLV2B – Adopt CARB 2003 SIP Requirements for Additional Products and VOC Limits (in addition to OTC Model Rule).* CARB has identified two strategies to further reduce VOC emissions from consumer and commercial products. CARB Measure CONS-1 (adopted July 20, 2005) sets or revises VOC limits for about 13 categories that must be complied with by December 31, 2006. This measure will achieve about a 2 percent reduction in VOC emissions over projected 2010 levels. CARB Measure CONS-2 is a commitment to develop rules between 2006 and 2008 to adopt new limits for consumer products (either mass-based or reactivity-based) as well as to set limits for previously unregulated categories. The combined emission reductions from implementation of both CONS-1 and CONS-2 are estimated to be between 9.7 and 15.5 percent in 2009.

## EXPECTED EMISSION REDUCTIONS

We calculated the approximate emission reductions expected from adoption of the OTC Model Rule and the CARB 2003 SIP commitments in the following manner:

- Obtained 2002 actual emissions from the MRPO's 2002 inventory (Note: these estimates account for the estimated 20% reduction from products covered by the Federal Part 59 rule; since only 40 percent of the total inventory is covered under the Federal rule, the overall reduction from the Federal rule is about 8.0%; see References 3 and 7);
- Assumed that the OTC Model Rule is adopted in 2007 by all five MRPO states and that full implementation will be achieved by 2009, resulting in a 14.2% reduction beyond the reduction provided by the Federal Part 59 rule; and,
- Assumed that the CARB 2003 SIP limits, in addition to the OTC Model Rule, is adopted in 2007 by all five MRPO states and that full implementation will occur by 2009, resulting in 12.5% reduction beyond the reduction provided by the OTC Model Rule and Federal Part 59 rule.

Current emissions and the expected emission reductions from candidate control measures are summarized in Table 2. If the MRPO States adopt the OTC Model Rule, the incremental reduction of 14.2 percent beyond the Federal Part 59 requirements would result in a reduction of 23,548 tpy of VOC in 2009 across the 5-state region. The CARB estimates that VOC emissions can be further reduced by an additional 9.7-15.5 percent beyond that obtained from their existing regulations (which are similar to the OTC Model Rule. If this measure is adopted by the MRPO States, the average incremental reduction of 12.5 percent (mid-point of estimated 9.7-15.5 percent reduction estimated by CARB) beyond the OTC Model Rule would result in an additional reduction of 17,785 tons/year of VOC.

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**TABLE 2 – COMPARISON OF 2002, OTC MODEL RULE, AND CARB 2003 SIP EMISSION SCENARIOS**

			VOC Emissions (tons/year)				
			Includes 8.0% overall reduction from Federal Part 59 Rule	With OTC Model Rule 14.2% beyond Federal Rule		With CARB 2003 SIP limits and OTC Model Rule 12.5% beyond OTC Rule	
SCC	SCC Description	2002 Actual		Incremental Emissions Reduction	2009 Emissions Remaining	Incremental Emissions Reduction	2009 Emissions Remaining
IL	2460xxxxxx	Consumer and Commercial Products	45,444	6,453	38,991	4,874	34,117
IN	2460xxxxxx	Consumer and Commercial Products	22,213	3,154	19,059	2,382	16,676
OH	2465000000	Consumer and Commercial Products	36,684	5,209	31,475	3,934	27,541
MI	2460xxxxxx	Consumer and Commercial Products	41,688	5,920	35,768	4,471	31,297
WI	2460xxxxxx	Consumer and Commercial Products	19,800	2,812	16,988	2,124	14,865
<b>MRPO 5-State Total</b>			<b>165,829</b>	<b>23,548</b>	<b>142,281</b>	<b>17,785</b>	<b>124,496</b>

Note:

1. The 2009 emission estimates presented here are not growth-adjusted.

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## TIMING OF IMPLEMENTATION

The Federal Part 59 rule was promulgated on September 11, 1998, and required all regulated products manufactured after December 10, 1998 to meet the VOC content limits specified in the rule.

The OTC Model Rule set a compliance date of January 1, 2005, which was consistent with the date the CARB mid-term measures amendments will become effective. The January 1, 2005 compliance date would allow the limits for most products to take effect in California before becoming effective in the OTR. Although the CARB rule contained a sell-through provision (allows 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 OTC Model Rule did not. The sell-through period is simply a safeguard to prevent compliance action for occasional older products remaining on retail shelves. It should be noted, however, that many manufacturers are currently manufacturing products that meet the California and OTC limits. In additions, product inventories turn over quickly. Thus, it seems reasonable that a two-year window creates time for manufacturers to reformulate while continuing to sell their existing products in the MRPO region. As a result, a sell-through period is not necessary and it is anticipated that the full emission reduction potential achieved by adoption of the OTC Model Rule could be realized within two years of adoption of the rule (i.e., 2009).

The CARB 2003 SIP commits to establishing additional emissions limits that would become effective between 2006 and 2010, depending on the product category and allowing for a 3-year sell-through period. If the MRPO states adopted similar requirements, it is unlikely that the majority of emission reductions achieved by adoption of the CARB requirements would be realized by 2009.

## COST EFFECTIVENESS AND BASIS

The CARB has estimated the cost of their mid-term measures rule to be \$800 per ton. Since the OTC Model Rule emission limits are based on California's, this value should approximate costs that would be incurred to meet the same limits in the OTC rules.

The CARB calculated the cost effectiveness of CARB Measure CONS-1 (adopted July 20, 2005) to be \$4,800 per ton. The CARB has not yet estimated cost effectiveness for CARB Measure CONS-2 (compliance date of 2010). EPA's AirControlNET database estimates the incremental cost of CARB long-term limits to be \$4,680 per ton.

## CONTROL EFFICIENCY, RULE PENETRATION, AND RULE EFFECTIVENESS

Table 2 shows the control factors that will be applied to simulate the effects of the adoption of the OTC Model Rule or the OTC Model Rule plus CARB 2003 SIP limits. We have assumed that rules will be adopted in 2007 and that the rules will allow a 2-year "sell-through" period, with full compliance occurring in 2009. For 2002, the overall emission reduction percentage was obtained from Reference 7 for the seven product categories. The control efficiency (CE) is assumed to be 20 percent for each regulated product. Because emissions will be controlled via reformulations, the EIIP guidance recommends that the rule effectiveness (RE) can be assumed to be 100 percent for all coating types affected by the rule. Since not all products are regulated, the rule penetration (RP) accounts for the percentage of the overall inventory covered by the Federal regulation. Thus, the RP was back-calculated using the overall emission reductions and the CE/RE values.

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For the OTC Model Rule and OTC Model Rule plus CARB 2003 SIP limits control measures, additional subcategories of products will be regulated which will increase the rule penetration. More stringent limits will also apply to already regulated products, which will increase the control efficiency. Only the total emission reduction percentages are readily available for the OTC Model Rule and OTC Model Rule plus CARB 2003 SIP limits. For this reason, we have not assigned specific values for CE and RP for the candidate control measures, but rather will use the overall emission reduction percentage when creating the control factor files in RPO data exchange format.

**TABLE 2 – CONTROL FACTORS BY YEAR AND CONTROL MEASURE**

<b>Year</b>	<b>Control Measure</b>	<b>CE</b>	<b>RP</b>	<b>RE</b>	<b>Emission Reduction % from Uncontrolled</b>
2002 (Base) and 2003-2008	Federal Part 59 rule:				
	Personal Care Products	20	60.6	100	12.11
	Household Products	20	54.7	100	10.94
	Auto Aftermarket Products	20	44.8	100	8.97
	Adhesives and Sealants	20	41.5	100	8.30
	FIFRA-regulated Products	20	25.4	100	5.08
	Coatings and Related Products	20	0.0	100	0.00
	Misc. Products	20	0.0	100	0.00
	All Products	20	40.0	100	7.96
2009-2018	Federal Part 59 rule plus OTC Model Rule: All Products	Not known	Not known	100	21.0
2009-2018	Federal Part 59 rule plus OTC Model Rule plus CARB 2003 SIP limits: All Products	Not known	Not known	100	30.9

### **RULE DEVELOPMENT ISSUES**

The Federal Part 59 rule in no way prevents states from adopting more stringent VOC content limits. In California, more stringent regulations have been in place since 2000. Many of the OTC states have or will soon adopt the OTC Model Rule. The MRPO states could use the OTC Model Rule as a framework for developing state-specific regulations.

### **GEOGRAPHIC APPLICABILITY**

In an effort to maintain consistency and uniformity for the manufacturers of consumer products, it is preferable that any rules specifying more stringent VOC limits (whether the OTC Model Rule or the CARB 2003 SIP commitments) be implemented across the MRPO region. Thus, emission reductions would be realized in both ozone attainment and nonattainment counties.

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## TEMPORAL APPLICABILITY

Emission reductions would be realized throughout the year.

## AFFECTED SCCs

24-60-000-000	All Consumer and Commercial Products
24-60-100-000	All Personal Care Products
24-60-200-000	All Household Products
24-60-400-000	All Automotive Aftermarket Products
24-60-500-000	All Coatings and Related Products
24-60-600-000	All Adhesives and Sealants
24-60-800-000	All FIFRA Related Products
24-60-900-000	Miscellaneous Products (Not Otherwise Covered)
24-65-000-000	All Products/Processes

## OTHER IMPACTS

CARB examined the potential effect of consumer product regulations on global warming, stratospheric ozone protection, use of toxic air contaminants, water quality, and solid waste disposal. No significant adverse environmental impacts have been identified.

## REFERENCES

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2. California Air Resources Board. *Proposed 2003 State and Federal Strategy for the California State Implementation Plan, Section III: Consumer Products, Vapor Recovery, and Pesticides*. August 25, 2003.
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6. Eastern Research Group. *Emission Inventory Improvement Program, Consumer and Commercial Solvent Use, Volume III, Chapter 5*. August 1996.
7. E.H. Pechan & Associates, Inc. *Development of Growth and Control Factors for Lake Michigan Air Directors Consortium*. December 14, 2004.

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