

ATTACHMENT H

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

**Socioeconomic Assessment for
Proposed Amended Rule 1143—Consumer Paint Thinners and Multi-purpose
Solvents**

June 2010

Deputy Executive Officer
Planning, Rule Development & Area Sources
Elaine Chang, DrPH

Assistant Deputy Executive Officer
Planning, Rule Development & Area Sources
Laki Tisopulos, Ph.D., P.E.

Planning and Rules Manager
Planning, Rule Development & Area Sources
Naveen Berry

Author: Greg Hunter, Ph.D., Air Quality Specialist

Reviewed By: Sue Lieu, Ph.D., Program Supervisor
Jill Whynot, Director, Strategic Initiatives
William Wong, Principal Deputy District Counsel

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
GOVERNING BOARD**

Chairman: WILLIAM A. BURKE, Ed.D.
Speaker of the Assembly Appointee

Vice Chairman: DENNIS YATES
Mayor, City of Chino
Cities Representative, San Bernardino County

MEMBERS:

MICHAEL D. ANTONOVICH
Supervisor, Fifth District
Los Angeles County Representative

MARION ASHLEY
Supervisor, Fifth District
Riverside County Representative

MICHAEL A. CACCIOTTI
Councilmember, City of South Pasadena
Cities Representative, Los Angeles County, Eastern Region

BILL CAMPBELL
Supervisor, Third District
County of Orange

JANE W. CARNEY
Senate Rules Committee Appointee

JOSIE GONZALES
Supervisor, Fifth District
San Bernardino County Representative

RONALD O. LOVERIDGE
Mayor, City of Riverside
Cities Representative, Riverside County

JOSEPH K. LYOU, Ph.D.
Governor's Appointee

JUDITH MITCHELL
Councilmember, City of Rolling Hills Estates
Cities Representative, Los Angeles County, Western Region

JAN PERRY
Councilmember, City of Los Angeles
City of Los Angeles

MIGUEL PULIDO
Mayor, City of Santa Ana
Cities Representative, Orange County

EXECUTIVE OFFICER:

BARRY R. WALLERSTEIN, D.Env.

The draft socioeconomic assessment for Proposed Amended Rule 1143 has been updated to reflect current standard best practices for assessing regional economic impacts. Thus, Scenario A has been refined to include additional revenue from selling reformulated products. This updated analysis provides more realistic estimates of the potential impacts of the proposed rule amendment.

EXECUTIVE SUMMARY

A socioeconomic analysis was conducted to assess the impacts of Proposed Amended Rule 1143—Consumer Paint Thinners and Multi-purpose Solvents. A summary of the analysis and findings is presented below.

Elements and Benefits of Proposed Rule Amendments	Proposed Amended Rule (PAR) 1143 establishes a material VOC limit of 25 g/l for consumer paint thinners and multi-purpose solvents, effective January 1, 2011. The proposed rule amendments would reduce VOC emissions by 3.81 tons per day by 2012, which will contribute towards attaining the federal PM 2.5 and ozone standards in 2014 and 2024, respectively.
Affected Facilities and Industries	PAR 1143 will affect approximately 107 manufacturers and 12 distributors of paint thinners and multi-purpose solvents. The manufacturers and distributors belong to the industries of chemical manufacturing [North American Industrial Classification System (NAICS) Code 325] and wholesale trade (NAICS 42), respectively. All the users of thinners and solvents under PAR 1143 are assumed to be the general public.
Assumptions of Analysis	This analysis includes two scenarios to bracket a range of potential impacts. The cost of PAR 1143 is incurred either by consumers as price increases (Scenario A) or by manufacturers who will have to reformulate their products (Scenario B) to meet the requirement of PAR 1143. The analysis herein is based on a reduction from the current 300 g/l VOC limit to the proposed limit of 25 g/l. Since there are compliant products available currently, the price differences between compliant and non-compliant products are used as additional expenditures by consumers in Scenario A while they are used to approximate the reformulation, testing, and commercialization costs for manufacturers in Scenario B. Both scenarios reflect a three-year accelerated implementation schedule compared to CARB’s consumer product regulation. Cost differentials per gallon of product have been updated based on a recent survey. Gallons used as well as the REMI model have also been updated.
Compliance Costs	<p>The average annual total cost from 2011 to 2013 of PAR 1143 is \$13.8 million for complying with the proposed VOC limit of 25 g/l. In order to bracket the potential impacts, two scenarios were developed. These scenarios estimate economic impacts from different assignment of initial costs for parties affected by the regulation. Scenario A starts with all of the cost incurred by consumers. Depending on the product formulation selected, consumers may experience an increase in the product price of \$3-\$42 per gallon. However, the majority of the price increases are expected to be \$11 per gallon.</p> <p>Scenario B examines the potential impacts, if all costs will be initially incurred by manufacturers of thinners and solvents. \$3.5 million would be borne by local manufacturers, on average, from 2011 to 2013. The remainder of the \$13.8 million average annual compliance cost would be paid by manufacturers outside the AQMD.</p>
Jobs and Other Socioeconomic	The total impacts (i.e. jobs) of PAR 1143 are analyzed using the Regional Economic Models, Inc. (REMI) model, which includes published historical (until 2007) and projected economic data for assessing impacts of a policy.

Impacts	<p>Although the REMI model does not include the most recent economic statistics, the results of the model are still indicative of the underlying structure of the regional economy. Overall, a range of 58 to 118 jobs are projected to be forgone annually between 2011 and 2013, which is within the noise of the economic model used. 118 jobs could be foregone annually, on average, between 2011 and 2013 in the local economy, which is 0.0018 percent of the baseline jobs in the four-county area. The administrative and support services sector (NAICS 561) is projected to have the majority of jobs forgone (87 jobs).</p> <p>For Scenario B, a total of 58 jobs could be forgone annually, on average, between 2011 and 2013 in the local economy, which is 0.0006 percent of the baseline jobs in the four-county area. The chemical manufacturing industry where producers of paint thinners and solvents belong is projected to have 4 jobs forgone, on average, from 2011 to 2013.</p> <p>There would be few impacts on the relative costs of production and the delivery prices in the local economy resulting from the implementation of PAR 1143. These socioeconomic impacts reflect an accelerated three-year implementation schedule relative to CARB’s consumer product regulation, which will result in an earlier realization of both an air quality benefit and associated job loss impact.</p>
----------------	---

INTRODUCTION

Proposed Amended Rule (PAR) 1143 seeks to reduce emissions of volatile organic compounds (VOCs) by establishing a material VOC limit of 25 g/l for consumer paint thinners and multi-purpose solvents, effective January 1, 2011. The main purpose of the proposed amendments is to re-adopt the 25 g/l VOC limit with an earlier implementation date for the AQMD. Staff estimates that VOC emissions will be reduced by 3.81 tons per day by 2012. The socioeconomic assessment herein analyzes the impacts of the proposed rule amendments on affected facilities and the local economy for the three year period prior to the implementation of CARB's Consumer Products Regulation.

LEGISLATIVE MANDATES

The socioeconomic assessments at the AQMD have evolved over time to reflect the benefits and costs of regulations. The legal mandates directly related to the assessment of the proposed rule amendments include the AQMD Governing Board resolutions and various sections of the California Health & Safety Code (H&SC).

AQMD Governing Board Resolutions

On March 17, 1989 the AQMD Governing Board adopted a resolution that calls for preparing an economic analysis of each proposed rule amendments for the following elements:

- Affected Industries
- Range of Control Costs
- Cost Effectiveness
- Public Health Benefits

On October 14, 1994, the Board passed a resolution which directed staff to address whether the rules or amendments brought to the Board for adoption are in the order of cost effectiveness as defined in the AQMP. The intent was to bring forth those rules that are cost effective first.

Health & Safety Code Requirements

The state legislature adopted legislation that reinforces and expands the Governing Board resolutions for socioeconomic assessments. H&SC Sections 40440.8(a) and (b), which became effective on January 1, 1991, require that a socioeconomic analysis be prepared for any proposed rule or rule amendment that "*will significantly affect air quality or emissions limitations.*" Specifically, the scope of the analysis should include:

- Type of Affected Industries
- Impact on Employment and the Economy of the district
- Range of Probable Costs, Including Those to Industries
- Emission Reduction Potential
- Necessity of Adopting, Amending or Repealing the Rule in Order to Attain State and Federal Ambient Air Quality Standards

- Availability and Cost Effectiveness of Alternatives to the Rule

Additionally, the AQMD is required to actively consider the socioeconomic impacts of regulations and make a good faith effort to minimize adverse socioeconomic impacts. H&SC Section 40728.5, which became effective on January 1, 1992, requires the AQMD to:

- Examine the type of industries affected, including small businesses; and
- Consider socioeconomic impacts in rule adoption.

H&SC Section 40920.6, which became effective on January 1, 1996, requires that incremental cost effectiveness be performed for a proposed rule or amendment setting a Best Available Retrofit Control Technology (BARCT) requirement or a “feasible measure” relating to ozone, carbon monoxide (CO), oxides of sulfur (SO_x), oxides of nitrogen (NO_x), and their precursors. Incremental cost effectiveness is defined as the difference in costs divided by the difference in emission reductions between one level of control and the next more stringent control. Please see Section IX of the PAR 1143 Staff Report for a detailed assessment of the incremental cost effectiveness.

AFFECTED INDUSTRIES

PAR 1143 will affect approximately 107 manufacturers and 12 distributors of consumer paint thinners and multi-purpose solvents, of which 15 manufacturers and four distributors are in the district. The manufacturers and distributors belong to the industries of chemical manufacturing (NAICS 325) and wholesale trade (NAICS 42), respectively. All the users of thinners and solvents under PAR 1143 are assumed to be the general public, since professional painting contractors and local stationary sources are already under similar requirements under Rule 1171—Solvent Cleaning Operations.

Small Businesses

The AQMD defines a "small business" in Rule 102 as one which employs 10 or fewer persons and which earns less than \$500,000 in gross annual receipts. In addition to the AQMD's definition of a small business, the federal Small Business Administration (SBA), the federal Clean Air Act Amendments (CAAA) of 1990, and the California Department of Health Services (DHS) also provide definitions of a small business.

The SBA's definition of a small business uses the criteria of gross annual receipts (ranging from \$0.75 million to \$35.5 million), number of employees (ranging from 50 to 1,500), megawatt hours generated (4 million), or assets (\$175 million), depending on industry type (US SBA, 2008). The SBA definitions of small businesses vary by 6-digit North American Industrial Classification System (NAICS) code. For example, in the painting and coating manufacturing (NAICS 325510) sector a business with 500 or fewer employees is considered “small.”

The CAAA classifies a facility as a "small business stationary source" if it: (1) employs 100 or fewer employees, (2) does not emit more than 10 tons per year of either VOC or NO_x, and (3) is a small business as defined by SBA.

Dun and Bradstreet data on the facilities was available for sales for 15 facilities, and employees for 16 facilities, out of the 19 manufacturers and distributors in the district. Under the AQMD definition of a small business, there are three small businesses. Using the SBA definition of a small business, there are 10 small businesses. Under the CAAA definition of a small business, there are eight small businesses, assuming that all the facilities without the annual emission data emit less than 10 tons of VOC or NOx.

COMPLIANCE COST

The analysis below is based on lowering the existing 300 g/l VOC limit to 25 g/l, which is also a California Air Resources Board (CARB) approved requirement anticipated to go into effect on December 31, 2013. The proposed 25 g/l limit accelerates the implementation of CARB’s requirement by three years. As a result, the analysis herein considers only the costs during these three years. Two scenarios were performed to assess the cost impacts of PAR 1143. Scenario A assesses costs on consumers, and Scenario B assumes reformulation costs for manufacturers of consumer paint thinners and multi-purpose solvents. The two scenarios are used to bracket a range of potential impacts. Scenario A assumes costs are borne by consumers and Scenario B analyzes initial costs for manufacturers. The results herein are similar to those from the socioeconomic analysis performed for the March 2009 Rule 1143 adoption. However, cost differentials per gallon of product have been updated based on a recent survey. Gallons used have also been updated.

PAR 1143 also accelerates a CARB labeling requirement for certain acetone-base products by six months and clarifies the exemptions for Polyaspartic, Poly Urea, and Industrial Maintenance (IM) coatings. Based on staff interviews with product manufacturers, the additional labeling requirement to warn consumers is not anticipated to affect any products during the six month interim period, because manufacturers are not expected to reformulate solvents with acetone to meet the interim 300 g/l limit in the remaining six months. The IM coating exemption requires only a change to product label to indicate “exclusively.” Both of these provisions are assumed to generate no additional cost.

Scenario A

The annual average cost of the proposed amended rule is projected to be \$13.8 million between 2011 and 2013, based on the price differences between products that would comply with PAR 1143—compliant products—and those that are currently above the proposed emission limits (Table 1). The compliant products can be reformulated with acetone or other exempt solvents including PCBTF, aqueous-based, or soy based technologies. Table 1 shows the assumed penetration rates of different compliant products.

Table 1
Penetration Rates and Additional Costs of Compliant Products

	Acetone	Aqueous	Soy	PCBTF
Market Penetration	0.5	0.3	0.15	0.05
Price Difference (\$/gallon)	\$2.6	\$14.3	\$24.7	\$41.8

Based on a 2003 California Air Resources Board (CARB) survey of paint thinners and multi-purpose solvents, it is estimated that slightly over 1.2 million gallons of currently available high-VOC consumer paint thinners and solvents that are above the proposed VOC limit are sold in the district. It is assumed that the usage will be kept at this level for future years because the market for solvents fluctuates with economic conditions and the increased use of waterborne coatings displacing solvent-based coatings can accelerate the reduction in volume of solvents. The current emission inventory is based on the 2003 CARB survey. The gallon usage, together with the price differences and penetration rates in Table 1, yields an annual additional cost of \$13.8 million to consumers.

Scenario B

Manufacturers of currently available high-VOC consumer paint thinners and solvents will need to reformulate their products to meet the 25g/l VOC requirement of PAR 1143. However, the specific reformulation cost is difficult to determine since different manufacturers may utilize different technologies to meet the VOC limit. Because of the availability of compliant products currently, the price differences between compliant and non-compliant products are used as proxies for the reformulation, testing, and commercialization costs. The \$13.8 million average annual cost from 2011 to 2013 borne by consumers under Scenario A would be incurred by manufacturers (in and out of the AQMD) of paint thinners and multi-purpose solvents under Scenario B. Staff research suggests approximately 25 percent of affected manufacturers are located in the AQMD, which means that the annual average compliance cost from 2011 to 2013 share for in-basin manufacturers would be approximately \$3.5 million under Scenario B.

JOBS AND OTHER SOCIOECONOMIC IMPACTS

The REMI model (version 1.1.6) is used to assess the total socioeconomic impacts of a policy change. The model links the economic activities in the counties of Los Angeles, Orange, Riverside, and San Bernardino. The REMI model for each county is comprised of a five block structure that includes (1) output and demand, (2) labor and capital, (3) population and labor force, (4) wages, prices and costs, and (5) market shares. These five blocks are interrelated. Within each county, producers are made up of 165 private non-farm industries, three government sectors, and a farm sector. Trade flows are captured between sectors and borders as well as across counties and the rest of U.S. Market shares of industries are dependent upon their product prices, access to production inputs, and local infrastructure. The demographic/migration component has 160 ages/gender/race/ethnicity cohorts and captures population changes in births, deaths, and migration.

The assessment here is performed relative to a baseline where there is no adoption of PAR 1143. Direct effects of the policy change (the proposed amended rule) have to be estimated and used as inputs to the REMI model in order for the model to assess secondary and induced impacts for all the actors in the four-county economy on an annual basis and across a user-defined horizon (2011 to 2013). Direct effects of PAR 1143 include, for example, additional costs to the affected industries and additional sales of resins for reformulation and laboratory testing services at the county (or finer) level and by industry.

Two different simulation methods reflecting the two scenarios mentioned before are used to examine the total impact of PAR 1143 on the entire local economy. Scenario A focuses on the price differentials between lower and higher VOC thinners and solvents that consumers would have to pay and Scenario B uses the differentials to approximate the additional costs of reformulation, testing, and commercialization that manufacturers of thinners and solvents would face. Cost differentials per gallon of product have been updated based on a recent survey. Gallons used as well as the REMI model have also been updated.

Scenario A

The price differentials between lower and higher VOC paint thinners and solvents were modeled as an increase in the consumer price of other household operation, which would reduce consumer purchases and reduce demand in most sectors.

The price differential between lower and higher VOC paint thinners and solvents were also modeled as an increase in demand for the retail trade sector (NAICS 44-45). Increased retail demand will result from the higher price paid for VOC compliant products purchased by consumers at retail businesses selling compliant products.

Overall, a range of 58 to 118 jobs are projected to be forgone annually between 2011 and 2013, which is within the noise of the economic model used. 118 jobs could be foregone annually, on average, between 2011 and 2013 in the local economy, which is 0.0018 percent of the baseline jobs in the four-county area. Table 2 presents the estimated job impact by industry for the proposed amended rule. Most sectors would incur jobs forgone due to the reduction in purchasing power resulting from the increase in consumer prices. However, the retail trade sector would experience an increase of 83 jobs, on average, between 2011 and 2013 as a result of the increased demand from selling compliant products. The administrative and support services sector (NAICS 56) is projected to have the greatest number of jobs forgone. On average, 87 jobs would be forgone from 2011 to 2013 in the administrative and support services sector.

The estimate of 346 jobs forgone in the draft analysis, prior to the inclusion of the demand side effects was considered to be unrealistic based on standard best practices for the REMI model. There would be few impacts on the relative costs of production and the delivery prices in the local economy resulting from the implementation of PAR 1143.

Scenario B

In this simulation, the price differentials between the compliant lower, and the conventional higher-VOC paint thinners and solvents are used to approximate the additional costs of reformulation, testing, and commercialization that local manufacturers of the lower VOC products may face under the requirements of PAR 1143. For the purpose of this analysis, based on research conducted by staff it is estimated that approximately 25 percent of the 1.2 million gallons total of paint thinners and solvents sold in the basin would be produced in the district. The number of manufacturers located in each county is used to distribute the total local production of thinners and solvents to each county. It is further assumed that 25 percent of the local production cost will be for reformulation and the rest for testing and commercialization.

There will be increased demand for low-VOC technology in the chemical manufacturing industry and for product testing and commercialization services provided by the professional and technical services industry (NAICS 54), as local producers of paint thinners and solvents reformulate existing products. On the other hand, local producers of paint thinners and solvents (part of chemical manufacturing industry) would incur additional costs of doing business for their expenditures.

Table 2
Job Impacts of PAR 1143 (Scenario A)

Industry	NAICS	2011	2012	2013	Average
Construction	23	-1	1	1	0
Chemical manufacturing	325	0	0	0	0
Other manufacturing	31-33	-2	-1	-1	-1
Wholesale trade	42	-6	-5	-5	-5
Retail trade	44-45	86	84	80	83
Truck transportation	484,492	-33	-33	-32	-33
Warehousing and storage	493	-3	-3	-3	-3
Monetary authorities	521,522,525	-2	-2	-2	-2
Securities and investments	523	-2	-2	-1	-2
Insurance carriers and related activities	524	-6	-6	-6	-6
Real estate	531	-4	-4	-4	-4
Rental and leasing services	532,533	-3	-3	-3	-3
Professional and technical services	54	-19	-17	-17	-18
Management of companies and enterprises	55	1	1	1	1
Administrative and support services	561	-89	-87	-85	-87
Educational services	61	-1	-1	-1	-1
Health care and social assistance	62	-7	-6	-6	-7
Performing arts and spectator sports	711	-1	0	0	0
Amusement, gambling, and recreation	713	-1	-1	-1	-1
Accommodation	721	0	0	0	0
Food services and drinking places	722	-3	-3	-4	-3
Repair and maintenance	811	-20	-20	-19	-20
Personal and laundry services	812	-3	-2	-2	-2
Membership associations and organizations	813	-1	-1	-1	-1
Private households	814	-2	-2	-1	-2
Government	92	-1	-1	-1	-1
Other industries		-3	-2	-2	-3
Total		-125	-115	-115	-118

Based on the thinners and solvents produced in the district (25 percent of 1.2 million gallons), overall, 58 jobs could be forgone annually, on average, between 2011 and 2013 in the local economy, which is 0.0006 percent of the baseline jobs in the four-county area. Table 3 presents the estimated job impact by industry for the proposed rule amendment. Projected job gains in the industries of chemical manufacturing and professional and technical services in 2011 are due to the additional expenditures on low-VOC technology, as well as on testing and commercialization services. Other sectors also show modest job gains in 2011 as the local economy benefits from the additional demand for materials and services used in the reformulation process. Starting in 2012, the impact of the additional cost of doing business by the local manufacturers of thinners and solvents would outweigh the impact of the additional demand, thus resulting in overall jobs forgone.

Table 3
Job Impacts of PAR 1143 (Scenario B)

Industry	NAICS	2011	2012	2013	Average
Construction	23	21	2	-27	-2
Chemical manufacturing	325	5	-4	-12	-4
Other manufacturing	31-33	12	-5	-20	-4
Wholesale trade	42	12	-4	-18	-3
Retail trade	44-45	34	-11	-53	-10
Truck transportation	484,492	5	-1	-7	-1
Warehousing and storage	493	1	0	-2	0
Monetary authorities	521,522,525	10	-2	-13	-2
Securities and investments	523	9	-2	-12	-2
Insurance carriers and related activities	524	4	-1	-5	-1
Real estate	531	16	-3	-20	-2
Rental and leasing services	532,533	1	0	-2	0
Professional and technical services	54	252	-6	-261	-5
Management of companies and enterprises	55	3	-1	-5	-1
Administrative and support services	561	45	-5	-53	-4
Educational services	61	6	-1	-7	-1
Health care and social assistance	62	37	-7	-48	-6
Performing arts and spectator sports	711	4	-1	-4	-1
Amusement, gambling, and recreation	713	3	0	-4	0
Accommodation	721	3	0	-3	0
Food services and drinking places	722	17	-1	-20	-1
Repair and maintenance	811	5	-1	-7	-1
Personal and laundry services	812	10	-3	-13	-2
Membership associations and organizations	813	4	0	-5	0
Private households	814	9	-2	-11	-1
Government	92	5	-1	-6	-1
Other industries		16	-3	-19	-3
Total		542	-65	-650	-58

As with Scenario A, there would be few impacts on the relative costs of production and the delivery prices in the local economy resulting from the implementation of PAR 1143. These socioeconomic impacts reflect an accelerated three-year implementation schedule relative to CARB's consumer product regulation, which will result in an earlier realization of both an air quality benefit and associated job loss impact.

RULE ADOPTION RELATIVE TO THE COST EFFECTIVENESS SCHEDULE

On October 14, 1994, the Governing Board adopted a resolution that requires staff to address whether rules being proposed for adoption are considered in the order of cost effectiveness. The 2007 Air Quality Management Plan (AQMP) ranked, in the order of cost effectiveness, all of the proposed control measures for which costs were quantified. It is generally recommended that the most cost-effective actions be taken first.

PAR 1143 implements Control Measure CTS-04 in the 2007 AQMP. Its cost effectiveness was not assessed in the AQMP due to unavailability of cost data at the time. Staff estimates that the overall cost effectiveness of PAR 1143 is approximately \$9,900 per ton of VOC, which would have been in the top quarter of the cost effectiveness ranking for stationary and area sources in the 2007 AQMP.

REFERENCES

Regional Economic Modeling Inc. (REMI). Policy Insight® for the South Coast Region (169 sector model). Version 1.1.6.

South Coast Air Quality Management District (AQMD). Proposed Amended Rule 1143—Consumer Paint Thinners and Multipurpose Solvents, July 2010.

AQMD. Draft Staff Report for Proposed Amended Rule 1143—Consumer Paint Thinners and Multipurpose Solvents, April 2010.

AQMD. Rule 1143 Socioeconomics Analysis. February 2009.

AQMD. Rule 1171—Solvent Cleaning Operations, February, 2008.

U.S. Small Business Administration (US SBA). “Small Business Size Standards.” August 2008.