

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

**Draft Socioeconomic Assessment for  
Proposed Amended Rule 1113—Architectural Coatings**

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## EXECUTIVE SUMMARY

A socioeconomic analysis was conducted to assess the impacts of Proposed Amended Rule 1113—Architectural Coatings. A summary of the analysis and findings is presented below.

<b>Elements of Proposed amendments</b>	Proposed Amendments to Rule 1113 (PAR 1113) would lower the VOC limit for several product categories, and the limit VOC content for the currently unregulated colorant category, effective on January 1, 2014. In addition, the proposed amendments would limit coating categories eligible for the Averaging Compliance Option (ACO), effective January 1, 2012, and phase out the ACO by 2015. Other proposed amendments include consideration of new coating categories and their VOC content limits, and clarification of the labeling and small container exemption provisions. The proposed amendments would reduce VOC emissions by 4.4 tons per day by 2015.
<b>Affected Facilities and Industries</b>	PAR 1113 would affect 198 coating manufacturers, of which 48 are local, and 3,436 retail outlets selling paints in the four-county area. The manufacturers and retail outlets belong to the industries of chemical manufacturing (NAICS 325) and retail trade (NAICS 44), respectively. PAR 1113 would also affect the end-users of coatings which include paint and wall covering contractors and the general public. The paint contractors belong to the construction sector (NAICS 238).
<b>Assumptions of Analysis</b>	<p>Two Scenarios were created to assess the cost impacts of PAR 1113. Scenario A uses the price differential between compliant and noncompliant coatings that coating users would have to pay to estimate the direct impact of reformulation on these users. Scenario B places the direct impact of reformulation on coatings manufacturers and uses the price differentials to approximate the cost of reformulation to these manufacturers.</p> <p>In addition, to comply with the proposed colorant VOC limits, the two scenarios assume that retail outlets selling paints would incur additional labor cost to maintain and/or calibrate their dispensing machines more frequently.</p>
<b>Compliance Costs</b>	The majority of the price increases between the compliant and noncompliant coatings are expected to be about \$2 to \$5 per gallon. The average annual total cost of the proposed amendments is estimated to be \$8.66 million of which there would be a savings of \$0.05 million resulting from the ACO phase out. Under both Scenario A and B, the local retail paint outlets will incur an average annual cost of \$5.43 million. The remaining \$3.23 million cost would be incurred by paint contractors and consumers under Scenario A and by manufacturers of coatings under Scenario B.
<b>Jobs and Other Socioeconomic Impacts</b>	The secondary and induced impacts of the proposed amendments are analyzed using the Regional Economic Models, Inc. (REMI) model, which includes published historical and projected economic data in assessing impacts of a policy. Overall, 21 jobs could be forgone annually, on average, between 2012 and 2025 in the local economy under Scenario A, which is 0.0002% of the baseline jobs in the four-county area. Under Scenario B, one job could be forgone annually, on average, between 2012 and 2025 in the local economy,

	<p>which is 0.00001% of the baseline jobs in the four-county area. The estimated job impacts from both scenarios are considered to be within the noise of the model.</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 the proposed amendments.</p>
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## INTRODUCTION

The proposed amendments to Rule 1113 (Architectural Coatings) would lower the VOC limit for the categories of dry fog, form release, fire proofing, mastic, graphic arts, and metallic pigmented; and limit the VOC content for the currently unregulated colorant category, effective January 1, 2014. In addition, the proposed amendments would limit coating categories eligible for the Averaging Compliance Option (ACO), effective January 1, 2012. PAR 1113 would also phase out the ACO by 2015. Other proposed amendments include consideration of new coating categories and their VOC content limits, and clarification of the labeling and small container exemption provision. The proposed amendments would reduce VOC emissions by 4.4 tons per day by 2015.

## LEGISLATIVE MANDATES

The socioeconomic assessments at the South Coast Air Quality Management District (AQMD) have evolved over time to reflect the benefits and costs of regulations. The legal mandates directly related to the assessment of the proposed 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 amendments or amendment 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 proposed amendments 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 amendments 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 Basin
- 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

For the emission reduction potential and necessity of adopting the proposed amendments as well as availability and cost effectiveness of alternatives to the proposed amendments, please refer to the Staff Report of Proposed Amended Rule 1113. 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 Business and Small Business Impacts; 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 amendment or amendment relating to ozone, carbon monoxide (CO), oxides of sulfur (SO<sub>x</sub>), oxides of nitrogen (NO<sub>x</sub>), 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. Incremental cost effectiveness analysis is presented in the Staff Report prepared for the proposed amendments.

## **AFFECTED INDUSTRIES**

The proposed amendments to Rule 1113 would affect 198 coating manufacturers, of which 48 are local, and 3,436 retail outlets selling paints in the four-county area. The manufacturers and retail outlets belong to the industries of chemical manufacturing (NAICS 325) and retail trade (NAICS 44), respectively. PAR 1113 would also affect the end-users of coatings which include paint and wall covering contractors (paint contractors) and the general public. The paint contractors belong to the construction sector (NAICS 238). According to the County Business Patterns, there are approximately 1,600 paint and wall covering contractors in the district.

### **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, 2010). The SBA definitions of small businesses vary by 6-digit North American Industrial

Classification System (NAICS) code. A business in the painting and wall covering contractors sector with less than \$14 million in gross annual receipts is considered small by SBA.

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 NOx, and (3) is a small business as defined by SBA.

Out of the 48 coating manufacturers in the district, information on sales for 11 facilities and that on employees for 23 facilities were available, based on 2011 Dun and Bradstreet data. Under the AQMD definition of small business, there are two small businesses. Using the SBA definition of small business, there are 22 small businesses. Under the CAAA definition of small business, there are 21 small businesses assuming that all the facilities without the annual emission data emit less than 10 tons of VOC or NOx.

Out of the 3,436 local affected retail outlets selling paints, information on sales for 296 facilities and that on employees for 315 facilities were available from Dun and Bradstreet. Under the AQMD definition of small business, there are 244 small businesses. Under the SBA's and CAAA's definitions of small business, 296 retail outlets are small businesses.

Since there is no listing of individually affected paint contractors, the number of affected small businesses cannot be determined. However, due to the fact that the majority of the businesses in this sector are small shops, most of them could potentially be small businesses.

## **COMPLIANCE COST**

In order to meet the lower proposed VOC limits, it is assumed that affected coating manufacturers would need to reformulate their noncompliant coatings that fall under categories of dry fog, form release, fire proofing, mastic, graphic arts, and metallic pigmented; and colorant by 2014. In addition, affected manufacturers are expected to reformulate specialty primer, primer, sealer, undercoaters (PSU), and waterproofing and concrete/masonry sealers (WPCMS) that would no longer be eligible for the average compliance option (ACO) by 2012. Lastly, all the remaining high VOC categories that are eligible for averaging would have to be reformulated (or no longer be sold) due to the phase out of ACO after 2015.

To comply with the proposed colorant VOC limits, it is assumed that retail outlets selling paints would need to maintain and/or calibrate their dispensing machines more often. This analysis includes the additional labor costs associated with increased maintenance and calibration of colorant dispensers at retail paint outlets.

Two Scenarios were created to assess the cost impacts of PAR 1113. Scenario A uses the price differentials between compliant and noncompliant coatings that coating users would have to pay to estimate the direct impact of reformulation on these users. Scenario B places the direct impact of reformulation on coatings manufacturers and uses the price differentials to approximate the cost of reformulation to these manufacturers. The two Scenarios are used to estimate the potential impacts from two different perspectives.

## Scenario A

Table 1 shows the additional cost that coating users would have to pay for the compliant products based on the price differences between compliant and non-compliant products. These users include paint contractors and consumers. The annual cost to the end users was estimated by multiplying the number of gallons used by the incremental cost (or savings) per gallon of compliant coatings. The total annual cost to the coating users is estimated to be \$3.23 million. Please see the Staff Report for more detailed assumptions.

**Table 1**  
**Incremental Coating Prices by Category**

Coating Categories	Implementation Date	Incremental Cost/Gallon	Number of Gallons
Dry Fog	2014	\$0.91	79,211
Form Release	2014	\$0.00	133,371
Fire Proofing	2014	\$2.97	2,586
Graphic Arts	2014	\$4.77	2,424
Metallic Pigmented	2014	\$13.19	4,601
Mastic	2014	\$5.68	172,032
Colorant	2014	\$1.80	1,000,320
Specialty Primer	2012	\$4.79	248,380
PSU	2012	-\$3.07	121,107
WPCMS	2012	\$3.28	2,254
ACO Phase-out*	2015	-\$0.07	928,134
<b>Total</b>			<b>2,694,420</b>

\*Represents the weighted average price of those coatings that would no longer be eligible for averaging, thus would have to be reformulated.

According to a 2009 staff survey, the ultra-low VOC colorants could result in more frequently clogging of dispenser tips. As a result, retail outlets may need to maintain and/or calibrate their dispensing machines more often. Although such impacts may have been minimized due to the fact that the revised proposed VOC limits for colorants are somewhat higher now than was originally proposed during the initial stages of rule development process, this analysis assumes that the same costs due to more frequent maintenance and calibration will still be incurred.

It is assumed that all the 3,436 retailers would increase their labor maintenance by 10 minutes a day, with an estimated labor cost of \$30 per hour (a total of \$1,825 per year). The total annual labor cost for the 3,436 retailers would be \$6.27 million.

Some retail outlets may need to replace their dispenser units and perform additional calibration or other maintenance. Based on feedback from coating and dispenser manufacturers, there would be no increase in the replacement cost because market forces have actually lowered the cost of these new dispensers. Furthermore, national paint outlets such as Home Depot and

Lowe's that sell the majority of coatings are in the process or have already switched to new dispensers and as such, no additional replacement cost was assumed for these outlets.

It is assumed that the 221 retail outlets that use automated dispensing machines may need to perform additional calibration or other maintenance on their dispensers at \$300 per year or \$66,300 annually for the 221 retail outlets. Retail outlets that use manual dispenser machines or new generation dispensers would not need to perform additional calibration or other maintenance. As a result, the total annual labor cost to retailers is estimated to be \$6.34 million.

Based on the data received from chemical manufacturing industry representatives, it is assumed that paint contractors account for an estimated 65 percent of total paint sales and consumers account for the remaining 35 percent. As a result, they are estimated to share 65 percent (\$2.10 million) and 35 percent (\$1.13 million) of the estimated cost (\$3.23 million), respectively. The total average annual cost of PAR 1113 is projected to be \$8.66 million (Table 2).

**Table 2**  
**Average Annual Cost of Proposed Amendments (Scenario A)**  
**(in millions of dollars)**

<b>Affected Industries</b>	<b>2012</b>	<b>2014</b>	<b>2015</b>	<b>2025</b>	<b>Average Annual Cost (2012-2025)</b>
<b>Retail Outlets</b>	\$0	\$6.34	\$6.34	\$6.34	\$5.43
<b>Consumers</b>	\$0.29	\$1.29	\$1.27	\$1.27	\$1.13
<b>Paint Contractors</b>	\$0.54	\$2.40	\$2.36	\$2.36	\$2.10
<b>Total</b>	<b>\$0.82</b>	<b>\$10.03</b>	<b>\$9.96</b>	<b>\$9.96</b>	<b>\$8.66</b>

### Scenario B

Manufacturers of noncompliant coatings will need to reformulate their products to meet the VOC requirements of PAR 1113. However, different manufacturers may utilize different technologies to meet the VOC limits and therefore their reformulation costs may differ. Since manufacturers treat these costs as proprietary, they do not provide cost data to the AQMD. As a result, AQMD utilizes the price differences between compliant and non-compliant products as proxies for the one-time reformulation, testing, and commercialization costs. The \$3.23 million (\$1.13 plus \$2.10 million) cost to paint contractors and consumers under Scenario A will thus be incurred by the coating manufacturers (in and out of the district).<sup>1</sup> The cost to retail outlets for additional calibration and maintenance of dispensers remains the same as Scenario A. The \$8.66 million total average annual cost of the proposed amendments is distributed as follows:

<sup>1</sup>The equivalent one-time reformulation, testing, and commercialization cost based on the annual \$3.23 million price differentials is \$ 35.6 million. This was based on four-percent real interest rate and compliance period from 2012 to 2015.

**Table 3**  
**Average Annual Cost of Proposed Amendments (Scenario B)**  
**(in millions of dollars)**

<b>Affected Industries</b>	<b>Average Annual Cost (2012-2025)</b>
<b>Chemical Manufacturing</b>	\$3.23
<b>Retail Outlets</b>	\$5.43
<b>Total</b>	<b>\$8.66</b>

## **JOBS AND OTHER SOCIOECONOMIC IMPACTS**

The REMI model (version 1.2.7) 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 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 the proposed amendments. Direct effects of the policy change (the proposed amendments) 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 (2012 to 2025). Direct effects of PAR 1113 include additional costs to the affected industries and additional sales of materials by local vendors 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 the proposed amendments on the entire local economy. Scenario A uses the price differentials between lower and higher VOC coatings as additional costs to consumers and paint contractors and Scenario B uses the differentials to approximate the additional costs of reformulation, testing, and commercialization that manufacturers of coatings would face.

### **Scenario A**

Higher prices of compliant products would translate into additional sales to the retail sector, which would spur additional production at the manufacturing level. Coating manufacturers would make necessary purchase decisions to support additional production. This process continues until the economy reaches an equilibrium. The interactions among industries and between industries and consumers are captured in the REMI model as secondary and induced

impacts. On the other hand, the price differentials between lower and higher VOC coatings would increase the cost of doing business for paint contractors and the expenditure of durable house furnishings for consumers. The additional labor required for maintaining dispenser units at retail stores would result in a reduction in labor productivity because more labor will now be required to produce the same amount of output.

Overall, 21 jobs could be forgone annually, on average, between 2012 and 2025 in the local economy, which is 0.0002% of the baseline jobs in the four county area. Table 4 presents the estimated job impact by industry for the proposed amendments. The retail sector is projected to gain an average of 25 jobs from 2012 to 2025 due to additional sales from compliant coatings. Construction sector would experience five jobs forgone due to additional cost of doing business incurred by painting contractors. The remaining sectors would incur minor jobs forgone due to secondary and induced impacts resulting from interactions between industries and consumers. It should be noted that the estimated 21 jobs forgone annually from Scenario A, on average, from 2012 to 2025 are considered to be within the noise the model.

**Table 4**  
**Job Impacts of Proposed Amendments (Scenario A)**

Industries	2012	2015	2025	Average Annual (2012-2025)
Construction	-1	-6	-5	-5
Manufacturing	-1	-3	-3	-3
Wholesale Trade	-1	-4	-4	-3
Retail Trade	2	39	21	25
Transportation and Warehousing	0	-1	-2	-1
Information	0	-1	-1	-1
Finance and Insurance	0	-2	-2	-2
Real Estate and Rental and Leasing	-1	-5	-5	-4
Professional and Technical Services	0	-4	-6	-4
Management of Companies and Enterprises	0	-1	-1	-1
Administrative and Waste Services	0	-4	-5	-4
Educational Services	0	-1	-1	-1
Health Care and Social Assistance	-1	-3	-4	-3
Arts, Entertainment, and Recreation	0	-1	-1	0
Accommodation and Food Services	-1	-2	-5	-3
Other Services, except Public Admin.	-1	-4	-4	-3
Government	-1	-5	-8	-6
<b>Total</b>	<b>-5</b>	<b>-7</b>	<b>-34</b>	<b>-21</b>

## Scenario B

Scenario B uses the price differentials between the compliant and the conventional higher-VOC coatings to approximate the additional costs of reformulation, testing, and commercialization that manufacturers of the lower VOC products may face under the requirements of the proposed amendments. Only coatings produced in the four-county area are modeled.<sup>2</sup> Colorant is not

<sup>2</sup> In order to model manufacturers outside of the four-county area, a REMI model including the rest of U.S. would be needed.

produced in the area and is thus not modeled. It is assumed that 57 percent of the remaining coatings categories are produced in the area based on the information from Rule 314 (Fees for Architectural Coatings).

There would 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 when local producers of coatings reformulate existing products. It is assumed that 25 percent of the local production cost will be used for reformulation and the rest for testing and commercialization. On the other hand, local producers of coatings (part of chemical manufacturing industry) would incur additional costs of doing business for their reformulation. The ratio of the sales volume of coatings sold by manufacturers in each county is used to distribute the total local production of affected coatings to each county. The additional labor required for maintaining dispenser units at retail stores would result in a reduction in labor productivity because more labor will now be required to produce the same amount of output.

Overall, one job could be forgone annually, on average, between 2012 and 2025 in the local economy, which is 0.00001% of the baseline jobs in the four-county area. Table 5 presents the estimated job impact by industry for the proposed amendments. The retail sector could gain an average of 17 jobs between 2012 and 2025 due to additional sales of the compliant coatings. Projected job gains in the industry of professional and technical services in 2012 are due to the additional expenditures on testing and commercialization services. Other sectors also show slight job gains in 2012 as the local economy benefits from the additional demand for materials and services used in the reformulation process. Over time, the jobs forgone from the additional cost of doing business by the local manufacturers of coatings offsets jobs created from their additional investment in formulation, thus resulting in net jobs forgone in later years. It should be noted that the estimated one job forgone annually from Scenario B, on average, between 2012 to 2025 are considered to be within the noise the model.

**Table 5**  
**Job Impacts of Proposed Amendments (Scenario B)**

<b>Industries</b>	<b>2012</b>	<b>2015</b>	<b>2025</b>	<b>Average Annual (2012-2025)</b>
Construction	2	-2	-3	-2
Manufacturing	1	-4	-4	-3
Wholesale Trade	1	-3	-3	-2
Retail Trade	3	28	13	17
Transportation and Warehousing	1	-1	-1	-1
Information	1	-1	-1	0
Finance and Insurance	2	-1	-1	-1
Real Estate and Rental and Leasing	2	-1	-2	-1
Professional and Technical Services	30	-5	-4	2
Management of Companies and Enterprises	0	-1	-1	-1
Administrative and Waste Services	4	-3	-3	-2
Educational Services	1	0	-1	0
Health Care and Social Assistance	3	-2	-3	-1
Arts, Entertainment, and Recreation	1	0	-1	0
Accommodation and Food Services	2	-1	-3	-1
Other Services, except Public Admin.	3	-2	-2	-1
Government	4	-3	-5	-3
<b>Total</b>	<b>59</b>	<b>0</b>	<b>-22</b>	<b>-1</b>

### Competitiveness

The additional cost brought on by the proposed amendments would increase the cost of production of the affected industries relative to their national counterparts. Changes in relative production costs would thus be a good indicator of changes in relative competitiveness. The magnitude of the impact depends on the size and diversification of, and infrastructure in a local economy as well as interactions among industries. A large, diversified, and resourceful economy would absorb the impact with relative ease.

Changes in production costs will affect prices of goods produced locally. The relative delivered price of a good is based on its production cost and the transportation cost of delivering the good to where it is consumed or used. The average price of a good at the place of use reflects prices of the good produced locally and imported elsewhere. Under both Scenarios, there would be few impacts on the relative costs of production and the delivery prices in the local economy resulting from the implementation of the proposed amendments.

### RULE ADOPTION RELATIVE TO THE COST-EFFECTIVENESS

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.

The proposed amended Rule 1113 will partially implement Control Measure MCS-07 (Application of All Feasible Measures). The cost-effectiveness of Control Measure MCS-07 was not assessed due to unavailability of cost data at the time. The overall cost effectiveness of PAR 1113 is estimated to be \$6,211 per ton of VOC, which would have been in the top quarter of the cost effectiveness ranking for stationary and area sources measures in the 2007 AQMP.

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