

[Notice](#)



142, No. 17 — April 26, 2008

Volatile Organic Compound (VOC) Concentration Limits for Automotive Refinishing Products Regulations

Statutory authority

Canadian Environmental Protection Act, 1999

Sponsoring department

Department of the Environment

REGULATORY IMPACT ANALYSIS STATEMENT

(This statement is not part of the Regulations.)

Description

Purpose

The purpose of the proposed *Volatile Organic Compound (VOC) Concentration Limits for Automotive Refinishing Products Regulations* (the proposed Regulations) to be made pursuant to subsection 93(1) of the *Canadian Environmental Protection Act, 1999* (CEPA 1999), is to protect the environment and health of Canadians by setting

concentration limits for VOCs in 14 categories of automotive refinishing products.

The proposed VOC concentration limits would apply to automotive refinishing products that comprise of chemically formulated products like pre-treatment wash primers, primers, primer sealers, colour coatings, clear coatings, truck bed liner coatings, and surface cleaners. These automotive refinishing products are used to refinish, service, maintain, repair, restore, or modify a motor vehicle or mobile equipment or their parts. The use of these automotive refinishing products contribute to Canadian urban VOC emissions. In 2005, the urban VOC emissions (excluding emissions from upstream oil and gas, oil sands development and forest fires) in Canada were estimated to be 100,383 kilotonnes. [\(see footnote 1\)](#) Solvent use accounted for 25% of these emissions, with automotive refinishing products accounting for 5.5 kilotonnes. [\(see footnote 2\)](#) The proposed VOC concentration limits are expected to reduce VOC emissions from these products by an average of 40% per year over 25 years.

The proposed VOC concentration limits are aligned with the provisions of the California Air Resources Board (CARB) suggested control measure (SCM), [\(see footnote 3\)](#) with some differences to ensure that maximum reductions in VOC emissions in Canada are effectively and efficiently achieved.

Background

The VOC emissions from automotive refinishing products are a contributing factor in the creation of air pollution, which is a serious problem in Canada. The use of automotive refinishing products results in the emission of VOCs from solvent-based products and, to a lesser extent, from water-based products. Precursor substances such as VOCs along with nitrogen oxides (NO_x) are involved in a series of complex photochemical reactions [\(see footnote 4\)](#) that result in the formation of ground-level ozone (O₃), which is a respiratory irritant and one of the major components of smog. Smog is a noxious mixture of air pollutants, consisting primarily of O₃ and particulate matter (PM) that can often be seen as a haze over urban centres.

Air pollution has been shown to have a significant adverse impact on human health, including premature deaths, hospital admissions and emergency room visits. Studies [\(see footnote 5\)](#),^{00A0;} [\(see footnote 6\)](#) indicate that air pollution is associated with an increased risk of lung cancer and heart disease.

Scientific evidence [\(see footnote 7\)](#) indicates that O₃ can also have a detrimental impact on the environment. This impact can lead to reductions in agricultural crop and commercial forest yields, reduced growth and survivability of tree seedlings, and increased plant susceptibility to disease, pests, and other environmental stresses (e.g. harsh weather).

In 1999, scientific assessments of PM and O₃ found that these substances met the criteria set out in section 64 [\(see footnote 8\)](#) of CEPA 1999 and were added to its Schedule 1 (List of Toxic

Substances). In addition, as a result of this scientific assessment, those VOCs which contribute to the creation of PM and O₃ were also found to meet the criteria set out in section 64 of CEPA 1999 and were added to the List of Toxic Substances in 2003. This made available the full range of management instruments under CEPA 1999, including regulations under subsection 93(1).

In December 2000, in order to address the Canada-U.S. transboundary flows of air pollutants (O₃), Canada and the United States signed the Ozone Annex to the 1991 Canada-U.S. Air Quality Agreement, [\(see footnote 9\)](#) with commitments to reduce VOC emissions from consumer and commercial products, which include automotive refinishing products.

On March 27, 2004, the Ministers of the Environment and of Health published Canada's *Federal Agenda for Reduction of Emissions of Volatile Organic Compounds (VOCs) from Consumer and Commercial Products* [\(see footnote 10\)](#) (the Federal Agenda). The Federal Agenda outlined the Government of Canada's plan to develop regulations under CEPA 1999 to set VOC emission standards for automotive refinishing products.

In October 2006, the Government of Canada published the *Notice of Intent to develop and implement regulations and other measures to reduce air emissions* [\(see footnote 11\)](#) (the notice of intent). The notice of intent outlined the approach that would be taken for reducing emissions of air pollutants including a commitment to propose regulations that would limit the concentration of VOCs in automotive refinishing products.

In April 2007, the Government of Canada released its *Regulatory Framework for Air Emissions* [\(see footnote 12\)](#) (the Regulatory Framework). The Regulatory Framework identified the reduction of VOC emissions from automotive refinishing products as part of the national *Clean Air Regulatory Agenda (CARA)*. [\(see footnote 13\)](#) The key components of the Regulatory Framework as they relate to consumer and commercial products include

- significant reductions of VOC emissions and other smog precursors from industrial, commercial and consumer products;
- bringing forward regulations between 2007 and 2010 to limit VOC concentration in automotive refinishing products, architectural coatings, and certain consumer products; and
- aligning the VOC concentration limits, where appropriate, with similar requirements in the .

Actions in other jurisdictions

A number of actions have been taken in the United States and the European Union to control the concentrations of VOCs in automotive refinishing products and are described in the following sections.

United States Environmental Protection Agency

In 1998, the United States Environmental Protection Agency (U.S. EPA) promulgated the *National Volatile Organic Compound Emission Standards for Automobile Refinish Coatings* (the National Rule.) [\(see footnote 14\)](#) The National Rule specifies VOC concentration limits for seven categories of automotive refinishing products.

California Air Resources Board

California was the first jurisdiction to enact rules for VOC concentration limits for automotive refinishing products, in an effort to address the smog problem affecting many of its cities. The severity of smog problems in the Los Angeles County air basin prompted the California South Coast Air Quality Management District (SCAQMD) in 1988 to develop VOC concentration limits for certain types of automotive refinishing products. Over the years, these limits have gradually been adjusted, in such a way that they are now the most stringent limits in the United States.

In 2005, CARB developed a set of limits that were recommended for use by the districts in California. The VOC concentration limits that were set by CARB suggested control measure (SCM) for automotive refinishing product categories are either equivalent to the SCAQMD limits, or are more stringent. The recommended effective dates for the CARB SCM vary by automotive refinishing product category, and are to be implemented by 2009 or 2010. In 2006, SCAQMD amended the *Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations Rule* to align with the CARB SCM. Other districts in California are considering amending their rules to align with CARB.

Ozone Transport Commission

In 2000, the Ozone Transport Commission (OTC), which represents 12 north-eastern states and the District of Columbia, developed a *Model Rule for Mobile Equipment Repair and Refinishing* for state regulations based on the VOC concentration limits of the U.S. EPA National Rule. The OTC is currently evaluating the potential for aligning their VOC concentration limits for automotive refinishing products with the CARB SCM standards.

Lake Michigan Air Directors Consortium

The main purpose of the Lake Michigan Air Directors Consortium (LADCO), which represents the states of Illinois, Indiana, Michigan, Wisconsin and Ohio, is to provide technical assessments for and assistance to its member states on problems of air quality, and to provide a forum for its member states to discuss air quality issues. Illinois, Indiana, and Wisconsin have adopted VOC concentration limits of the U.S. EPA National Rule, with additional emission controls on automotive refinishing related activities. In 2005, LADCO commissioned an assessment of the Reasonably Available Control Technology (RACT) for VOC concentration limits for automotive refinishing products. This assessment recommended adoption of the SCAQMD Rule as a control measure for strengthening RACT.

European Union

In April 2004, the European Union (EU) finalized a directive that is expected to reduce VOC emissions from coatings, including automotive refinishing products. The directive, effective January 1, 2007, sets VOC concentration limits for seven categories of automotive refinishing products.

Proposed Regulations

The objective of these proposed Regulations is to establish concentration limits for volatile organic compounds (VOCs) in 14 categories of automotive refinishing products, thereby protecting the health and environment of Canadians. During the period 2003 to 2006, Environment Canada collected VOC concentration data for a broad range of automotive refinishing products sold in Canada. The data was modelled using applicable VOC concentration limits in international jurisdictions, with the objective of selecting the one that provides the greatest potential reduction. The U.S. EPA, CARB, OTC and LADCO model rules, as well as the EU Directive, were considered in this analysis. The analysis indicated that establishing VOC concentration limits similar to CARB SCM would yield the maximum potential technical and economic level of VOC emissions reductions in Canada.

Therefore, the proposed Regulations were developed to align with provisions of the CARB SCM rule. The VOC concentration limits under these proposed Regulations were developed on the basis of this analysis, stakeholder feedback, and technical and economic consideration.

Application

The proposed regulatory VOC concentration limits would apply to 14 categories of automotive refinishing product categories, with some minor exceptions. The concentration limits and product categories are identified in the schedule to the proposed Regulations. For example, the VOC concentration limit for colour coatings is 420 g/L and 50 g/L for surface cleaners. If a person manufactures or imports an automotive refinishing product that falls into more than one category, the product would be required to meet the concentration limit for the category with the most stringent VOC concentration limit.

The proposed VOC concentration limits would not apply to the following:

- Automotive refinishing products imported, offered for sale or sold in non-refillable aerosol spray containers or manufactured to be packaged in non-refillable aerosol containers are exempt from the proposed Regulations. These products will be addressed in future measures aimed at reducing VOC emissions from coatings sold in non-refillable aerosol containers.
- Automotive refinishing products imported, offered for sale or sold in a container with a volume of 14.8 ml (0.5 fluid ounces) or less, or manufactured to be packaged in that type of

container are exempt from the proposed Regulations. These products (e.g. touch-up coatings) differ from typical automotive refinishing coating in that they are typically used by automobile owners to repair minor scratches or nicks, requiring no mixing prior to application, and are sold in small containers. Since touch-up coatings are considered an insignificant emission source representing no risk to environment or human health, these products are exempted in the proposed Regulations.

- Automotive refinishing products that are used during the manufacturing of motor vehicles or mobile equipment, or their parts on the assembly line are not subject to the proposed Regulations. These products will be addressed in future measures aimed at reducing VOC emissions from industrial point sources.
- Automotive refinishing products that are used as solvents in laboratories for analysis, scientific research, or as laboratory analytical standard are exempt from the proposed Regulations. The product quantities used and the associated VOC emissions are very small, representing no risk to environment or human health.
- Manufacture of automotive refinishing products for the purpose of export only is not subject to the proposed Regulations. These products would be subject to the relevant VOC requirement in those countries.

The proposed Regulations would prohibit the manufacture, offer for sale, sale or import of automotive refinishing products for use in Canada with concentrations of VOC in excess of the category-specific limits set out in the schedule to the proposed Regulations.

Test methods

The determination of the concentration of VOCs in the automotive refinishing coatings will be done using Method 24 of Appendix A-7, Part 60, Chapter 1 of Title 40 of the *Code of Federal Regulations* of the United States. This method will be used to verify compliance with the proposed VOC concentration limits for automotive refinishing coatings. It is most likely that manufacturers and importers would also use this method to determine the VOC concentration of the automotive refinishing coating.

Record-keeping requirements

Manufacturers or importers would be required to keep records of any analysis done to determine VOC concentration of a product and the name and address of the laboratory that conducted the analysis and supporting documentation. These records of information, testing results and supporting documentation must be kept at the principal place of business in Canada or, after notifying the Minister, at any other place in Canada where they can be inspected by an enforcement officer for a period of at least five years.

The type of the information to be retained is prescribed in the proposed Regulations.

The proposed Regulations would come into force in 2010.

Economic profile of the industry

Paint and coating manufacturing sub-sector

The world automotive refinishing products market is dominated by five large companies with manufacturing facilities located outside of Canada. These companies supply a large portion (approximately 85%) of the global market. Information collected from automotive refinishing product manufacturers through a 2003 Environment Canada voluntary survey, [\(see footnote 15\)](#) indicated that these companies also supply 85% of the Canadian automotive refinishing products market. Canadian automotive refinishing product manufacturers are small and medium-sized enterprises (SMEs). These SMEs are mainly involved in the production of automotive refinishing additives, surface cleaners and other niche products and supply approximately 15% of the Canadian automotive refinishing products market.

In Canada, revenue of the paint and coating manufacturing sub-sector (which includes the automotive refinishing products sub-sector) was approximately \$2.3 billion in 2005, and its gross domestic product (GDP) growth rate was approximately 2.5% between 2000 and 2005. Employment accounted for 7.5% of the labour force in the chemical manufacturing sector²⁰¹⁴; which includes the paint and coating manufacturing sub-sector. In 2005, Canada had a trade deficit of \$517.5 million, with the United States being the main trading partner for both imports and exports. Total exports were \$431.4 million, with exports to the United States accounting for nearly \$391.3 million, approximately 91% of total exports followed by China at \$5.3 million or 1.2% in 2005. In the same year, imports were approximately \$949 million, with the United States accounting for \$895 million or approximately 94% of total imports, followed by Germany at \$13.1 million or 1.4%.

Automotive refinishing and repair sub-sector

The automotive refinishing and repair sub-sector is the primary user of the automotive refinishing products, with an estimated 800A0;100 automotive refinishing and repair establishments (repair shops). It is estimated that 2700A0;000 people are employed by the repair shops.

The repair shops can be categorized into small, medium and large repair shops based on employment, process or revenue. Repair shop categorization is as follows:

Repair Shop Size	Employment	Revenue	Process
Small	1 to 3	< \$200,000	Without paint mixing machines and 1 paint booth
Medium	3 to 5	\$200,000 -	With paint mixing

		\$400,000	machines and 1-2 paint booths
Large	6 to 8	> \$400,000	With paint mixing machines and more than 2 paint booths

Irrespective of the categorization basis, the sub-sector is dominated by small and medium sized repair shops accounting for approximately 70% of the repair shops in the sub-sector. The regional distribution of the repair shops is directly correlated with population density, with large and medium sized repair shops concentrated in major urban centres and small repair shops catering to smaller towns and remote areas. The majority of repair shops are located in Ontario and Quebec accounting for approximately 60% (31 and 29%, respectively) of Canadian repair shops. The western provinces and territories account for an additional 29%, with an equal share of small, medium and large repair shops. The remaining 11% of the repair shops are located in the Atlantic Provinces, of which approximately 60% are small repair shops.

Alternatives

A number of alternatives, including regulatory and non regulatory options, were considered to achieve the expected reduction in VOC emissions from automotive refinishing products, and are discussed below.

Status quo

Scientific evidence ([see footnote 16](#)) indicates that the presence of VOCs in the environment is primarily due to human activity and that they are precursors to substances that are harmful to human health and the environment. Since the early 1990s, a number of voluntary actions have been implemented to reduce VOC emissions. Evidence shows that these actions are not able to provide the desired reduction in VOC emissions. Furthermore, maintaining the status quo would not result in achieving the reductions in VOC emissions required to meet Canada's international commitments under the Ozone Annex.

Market-based instruments

Market-based instruments, which include emission trading programs, financial incentives, deposit-refund systems, fees/charges and other market-based tools, were given due consideration. Market-based instruments work by providing incentives aimed at changing consumer and producer behaviour. When properly designed and implemented, market-based instruments can promote cost-effective ways of dealing with environmental issues. In addition, they can provide long-term incentives for pollution reduction and technological innovation.

An emission trading system was considered as a means of managing emissions of VOCs from the use of automotive refinishing products. However, a trading system would not function at the point of use

since there are a large number of widely dispersed users. There would also be significant issues around the measurement and verification of emission reductions. A trading system could be envisioned at the manufacturer level, however it is unlikely that such a system would be effective or efficient. Such a system would require setting a cap on the quantity of VOCs used for each of the facilities manufacturing automotive refinishing products. Moreover, a mechanism would need to be introduced to ensure that VOC reductions from automotive refinishing products or substances covered under other measures are not included in the cap, nor are VOCs in automotive refinishing products for export or intermediate processes. In addition, nearly 85% of the automotive refinishing products are imported. As these manufacturers are located outside, a trading system would be difficult to design and implement due to jurisdictional considerations. This lack of simplicity would raise the administrative costs of the mechanism substantially. A firm-size threshold would also need to be introduced so that small, niche manufacturers would not bear the relatively large administrative costs of the trading system. It is expected that the remaining large manufacturers would be limited in number and there would be insufficient differentiation in the marginal cost of abatement to support a trading system.

The purpose of a deposit-refund system is to recover and/or recycle a substance that remains in the product packaging or container or the container itself. However, as all VOCs would be emitted during application to a surface and it is not expected that any would remain in the automotive refinishing products containers for recovery, such an approach was considered inapplicable.

For the purpose of achieving VOC emission reductions, fees and charges were considered and analyzed as potential measures. Fees and charges could be levied on products containing VOCs above the proposed concentrations. It is expected that such a system would require a significant amount of time to implement, and as technology evolves, it would be costly and time consuming to make changes to the fee structure to achieve additional reductions. This approach was therefore also rejected.

The use of economic instruments, therefore, does not present itself as an effective option for reducing VOC emissions.

Additional voluntary measures

To date, voluntary measures have been the only mechanisms used in Canada to reduce VOC emissions from automotive refinishing products. So far voluntary action, education and awareness programs have made limited progress in lowering VOC emissions from the automotive refinishing sub-sector. For example, in 1998 the *CCME National Standards for the VOC Content of Automotive Refinish Products* and the *CCME National Standards and Guidelines for the Reduction of VOCs from Automotive Refinish Operations* were published. The product standards specified VOC content limits for several automotive refinishing product categories, while the guidelines established operating standards for new and existing surface coating operations of automotive refinishers and outlined a code of good practice for all operations. However, as there was

limited adoption of these product standards and guidelines, the reductions in VOC emissions were minimal. Greater reductions are needed to achieve the type of reductions outlined in the Regulatory Framework. The main concern with voluntary instruments is their lack of effectiveness in achieving significant VOC emission reductions. Since the majority of the automotive refinishing products are imported, it is difficult to leverage importers and foreign manufacturers to use the voluntary code. Furthermore, implementing voluntary measures would not enable Canada to meet its international and domestic commitments more effectively. Since the existing voluntary measures have resulted in minimal reductions of VOC emissions, additional voluntary measures are unlikely to result in greater reductions in VOC emissions and are not being considered any further as an option.

Regulations aligned with CARB suggested control measure

Developing regulations in Canada that are aligned with CARB limits was considered to be the most practical and effective way of reducing VOC emissions. Being mandatory, regulatory measures would provide the required level of certainty.

Aligning with CARB limits would ensure that Canada adopts the current state of technology. Other jurisdictions in the United States, such as OTC and SCAQMD, are in the process of evaluating the limits established by CARB. Therefore, aligning the proposed Regulations with CARB SCM would facilitate consistency across North America, provide a level playing field to manufacturers and importers of automotive refinishing products and avoid varying requirements across jurisdictions.

Benefits and costs

Analytical framework

The approach to the cost-benefit analysis identifies, quantifies and monetizes, where possible, the incremental costs and benefits associated with the proposed Regulations. The cost-benefit framework consists of the following elements:

- *Incremental impact:* Incremental impacts are analysed in terms of incremental emission reductions, costs and benefits to all interested parties as well as the economy. The incremental impacts were determined by comparing two scenarios: one without the proposed Regulations and the other with the proposed Regulations. The two scenarios are presented below.
- *Timeframe for analysis:* The time horizon used for evaluating the economic impacts is 25 years. The first year of the analysis is 2010, when the proposed Regulations are expected to come into force.
- *Approach to cost and benefit estimates:*
- All costs have been estimated in monetary terms to the extent possible and are expressed in 2006 Canadian dollars. Whenever this was not possible, due to lack of appropriate data or difficulties in valuing certain components or data inputs, the cost item has been evaluated in qualitative terms.

- Attempts were made to estimate the benefits associated with the proposed Regulations; however, due to modelling constraints it was not possible to analyze the impact of VOC emission reductions from automotive refinishing products on ambient air quality improvement and related environmental and human health benefits. Therefore, a qualitative assessment of benefits was done by considering benefit estimates obtained in other jurisdictions.
- *Discount rate:* A discount rate of 5% was used for this analysis. Since benefits could not be estimated, only the present value of the stream of costs was calculated. Sensitivity analysis using 3% and 7% discount rates to test the volatility of cost estimates to the discount rate has also been conducted.

Cost estimates are based on Environment Canada's voluntary survey conducted in 2003, [\(see footnote 17\)](#) supplemented by additional information from other sources and an economic study conducted in 2006. [\(see footnote 18\)](#) The data has been extrapolated to provide estimates for the entire Canadian market for automotive refinishing products.

Business as usual scenario

The business as usual (BAU) scenario assumes that automotive refinishing products manufactured and imported into Canada do not comply with the proposed regulatory limit (non-compliant automotive refinishing products) with an annual growth rate of 1.45%. The demand for automotive refinishing products is largely driven by the number of automobiles requiring repairs. Factors such as stricter laws governing road safety, the increase in the number of damaged vehicles declared total losses, replacement of damaged parts instead of repairs and a decrease in the number of small jobs lead to a decline in the overall number of repairs in the sub-sector. However, due to population growth, the number of automobiles on the roads is expected to increase, resulting in an increase in the number of vehicles requiring repairs and the demand for automotive refinishing products. Therefore, to meet the demand, it is reasonable to expect the manufacture and import of automotive refinishing products will continue to grow at the annual rate of 1.45% over the 25-year analysis period.

VOC emissions calculated as a percentage of automotive refinishing products are also assumed to grow as the quantities of these products increase. It is estimated that the level of VOC emissions would increase from 5.9 kilotonnes in 2010 to approximately 8.4 kilotonnes in 2034.

Regulatory scenario

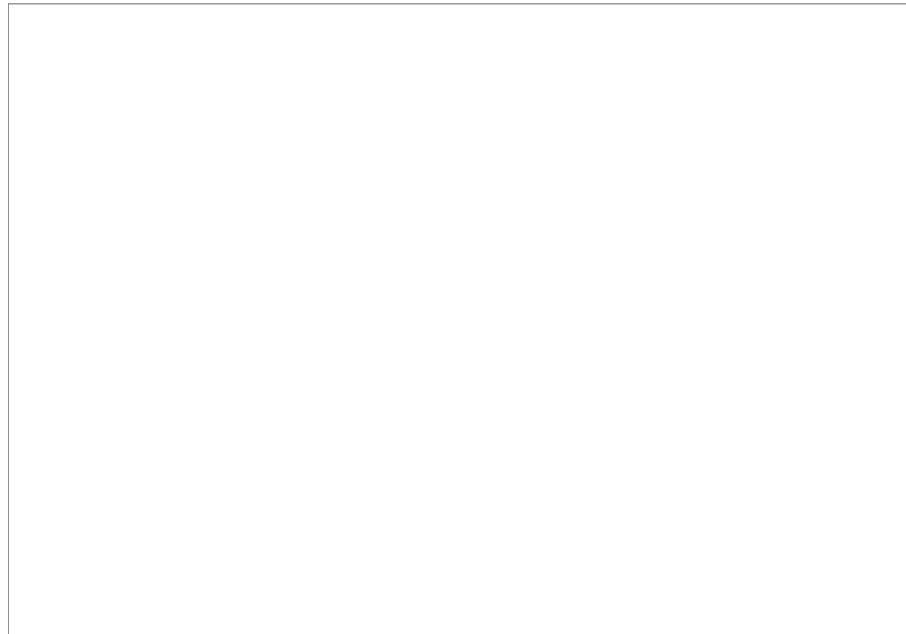
The regulatory scenario assumes implementation of the proposed Regulations according to the prescribed requirements and coming into force date.

As in the BAU scenario, it is expected that the automotive refinishing products manufactured and imported would grow at the rate of 1.45% during the 25-year analysis period. VOC emissions from the

automotive refinishing products would also increase as more of these products are manufactured or imported to meet the demand. However, the percentage concentration of VOCs in the automotive refinishing products would be considerably less with the proposed regulatory limit. Therefore, while the estimated VOC emissions would increase as the quantity of automotive refinishing products manufactured and imported increases and are used, these increases are estimated to be less than under the BAU scenario. With the proposed regulatory concentration limits in place, total VOC emissions from compliant automotive refinishing products are estimated to be 5 kilotonnes in 2034. These emissions are 3.4 kilotonnes lower compared to the BAU scenario.

Figure 1 presents the estimated emissions trends for 25 years under these two scenarios.

Figure 1: Total Estimated VOC Emissions from Automotive Refinishing Products (2002 to 2034)



The cumulative reduction in VOC emissions over the 25-year analysis period is estimated to be 71.2 kilotonnes (or an average annual reduction of 40% per year) as a result of the proposed VOC concentration limits.

Costs to industry

Automotive refinishing products manufacturers

Based on information collected by the Environment Canada survey, the majority of current automotive refinishing products would not meet the proposed VOC concentration limits. In order to meet the proposed regulatory requirements, manufacturers would be required to reformulate or discontinue non-compliant automotive refinishing products and increase the volume of manufactured compliant products. In most cases, compliant automotive refinishing products are currently available for most of the product categories, and it is therefore expected that reformulation of non-compliant products would not be required. The non-compliant automotive refinishing

products could be simply replaced with the existing compliant ones.

The impact of the proposed Regulations on the large global automotive refinishing products suppliers would be negligible. These companies have already transitioned to automotive refinishing products with low concentrations of VOCs in order to meet the regulatory requirements in Europe and the United States. Although these companies are currently supplying the Canadian market with automotive refinishing products that have high concentrations of VOCs, they have indicated that compliant automotive refinishing products are available and can be supplied at no or minimal additional cost. According to the information provided in the Environment Canada survey, some costs may be incurred during transportation and storage of automotive refinishing products by the manufacturers. This incremental cost would be reflected in a higher price of the automotive refinishing products paid by the users (i.e. the repair shops).

Small and medium-sized manufacturers in Canada would be impacted by the proposed Regulations, as some of them may need to reformulate their products. Manufacturers in Canada may incur some incremental costs of producing automotive refinishing products separately for domestic and export markets. Manufacturers are expected to incur the latter costs in cases where the increased cost of reformulated products negatively affects their competitiveness in international markets. Due to insufficient data, it is not possible to quantify these impacts, but they are expected to be minor.

Automotive refinishing and repair sub-sector

Of the 800A0;100 repair shops in Canada, approximately 72% are small repair shops and the remaining 28% are categorized as medium and large. To facilitate the analysis, the repair shops have been further classified on the basis of the paint mixing equipment. It is estimated that half of the small repair shops do not have paint mixing machines.

The incremental recurring costs include expenditure on automotive refinishing products, which varies with the size of the repair shop. For example, a small repair shop may spend approximately \$7,000 to \$15,000, while a large repair shop may spend from \$50,000 to \$70,000 annually on automotive refinishing product purchases. An increase in the price of these products would, therefore, result in an increase in the recurring costs to the repair shops.

The incremental one-time costs to repair shops include investments in new equipment or upgrades to existing equipment, to be able to use the compliant automotive refinishing products. Investments in spray guns, gun cleaning systems, compressors, storage heaters, air blowers, paint booth air enhancement equipment, new booths and compressed air filtration systems are estimated as one-time costs. In addition, the repair shops would also need to dispose of non-compliant automotive refinishing products and replace their inventory with compliant automotive refinishing products. In subsequent years, the incremental recurring costs would comprise primarily of the price differential between compliant and non-compliant automotive

refinishing products.

In addition to these costs, the repair shops would also incur training costs for all personnel involved in automotive refinishing activities, especially in the application of compliant automotive refinishing products.

The main cost assumptions include the following:

- each repair shop would purchase one gun cleaning system, air blowers and storage heaters and one spray gun per painter;
- repair shops with mixing machines would also invest in compressors and compressed air filtration systems;
- small repair shops with mixing machines would incur costs to dispose of and replace non-compliant automotive refinishing products and purchase colour tools. An estimated 4% of these repair shops would also invest in new paint booths;
- seventy-five percent of the medium and large repair shops would incur costs for booth air enhancements, 20% of them would invest in new booths and 40% would purchase compressors;
- all one-time equipment costs have been annualized over a ten-year period at a 5% interest rate. After ten years, no additional equipment costs would be incurred by the sub-sector;
- training costs would only be incurred in the first two years following the coming into force of the proposed Regulations. In subsequent years no incremental training costs are expected to be incurred; and
- all repair shops would incur a 5% increase in the costs for automotive refinishing products in the first five years following the coming into force of the proposed Regulations. During the remainder of the 25-year analysis period, the estimated increase in the recurring costs would be approximately 2.5%.

There is a high degree of uncertainty associated with the incremental impact of the proposed Regulations on recurring costs. The Canadian Paint and Coatings Association (CPCA), based on the experience in European Union countries, estimates the increase in recurring costs to range between 0% and 5%. Since there is a lack of verifiable data on the actual increase in recurring costs to repair shops in Canada, a range of 2.5% to 5% has been assumed for this analysis.

The incremental impact of the proposed Regulations on recurring costs is a function of the price of the automotive refinishing products and the quantity used. Discussions with automotive refinishing product manufacturers and the CPCA have indicated that the incremental impact is expected to include both an incremental cost due to higher product prices and an incremental benefit due to a reduction in the volume of refinishing product required to complete repair to an automobile. It is likely that the price of the automotive refinishing products would be higher only in the initial years, after which it is expected to stabilize at lower levels. It is also expected that, as repair shops gain experience in the use of paints with low concentrations of VOCs, the repair shops would improve the efficiency with which the products are applied. All these factors are

expected to lower the overall recurring cost impact within five years of the coming into force of the proposed Regulations.

Based on these assumptions, the compliance costs for the automotive repair sub-sector are presented in the following table.

Table 1: Incremental Cumulative Costs to Automotive Repair Sub-sector Between 2010 and 2034 (in 2006\$)

Incremental Costs	Present Value (in million \$)			
	Small Shops Without MM*	Small Shops With MM*	Medium and Large Shops	All Shops
One-time Equipment Costs	\$8.0	\$43.0	\$91.0	\$141.6
Automotive Refinishing Product Costs	\$14.7	\$44.0	\$66.6	\$125.3
Training Costs	\$4.1	\$24.5	\$26.5	\$55.1
Total Costs	\$27.0	\$111.5	\$184.0	\$322.0

Numbers may not add up due to rounding.

* MM refers to paint mixing machines.

It is estimated that the present value of recurring costs and one-time investments in equipment to upgrade the repair shops would be \$322 million, discounted at 5% over the 25-year time period. Given the level of uncertainty with regard to the incremental impact on automotive refinishing product prices and volumes of product used, a sensitivity analysis was conducted to assess the impact of varying the percentage increase in the recurring cost of automotive refinishing products from 0% to 15%. The incremental recurring costs could, therefore, vary from \$197 million in the best-case scenario (0%) to \$772 million (15%) in the worst-case scenario over the 25-year analysis period.

It is expected that the automotive refinishing product manufacturers would provide some support for training for their major customers, the large automotive repair shops. As the extent of this support is not known, it was not possible to evaluate the magnitude or importance of this cost to the automotive refinishing product manufacturers. Training costs have therefore been assigned in full to the automotive repair shops. However, it is reasonable to assume that the actual impact of the proposed Regulations on the automotive repair shops would be less than that estimated in this analysis, as some of the training costs may in fact accrue to the automotive refinishing product manufacturers. While this does not affect the incremental cost of the

proposed Regulations, it may have an impact on the profitability of some repair shops.

The automotive refinishing products manufacturer would also incur some administrative costs which primarily relate to the record keeping requirements of the proposed Regulations. These costs are expected to be negligible and, as such, have not been calculated for the purpose of this analysis.

Costs to the Government

The federal government is expected to incur costs for implementing the proposed Regulations. Government costs include enforcement and compliance promotion activities (including costs to administer the proposed Regulations) and are presented in the following table.

Table 2: Incremental Cumulative Costs to Government Between 2010 and 2034 (in 2006\$)

Costs	Present Value(in millions of dollars)
Enforcement	4.53
Compliance Promotion	0.39
Total Cost to Government	4.91

With respect to enforcement costs, an estimated one-time cost of \$250,000 would be incurred for training enforcement officers. For the first year following the coming into force of the proposed Regulations, an estimated budget of \$351,000 would be required. This would include an estimated \$331,200 for inspections (which includes operations and maintenance costs, transportation and sampling costs), \$14,300 for investigations and \$5,500 for measures to deal with alleged violations (including environmental protection compliance orders and injunctions).

For the subsequent nine years, the undiscounted enforcement costs would require an estimated annual budget of \$370,000, which would include costs for inspections, investigations, measures to deal with alleged violations and prosecutions. During the remainder of the 25-year period, undiscounted enforcement costs are assumed to require an annual budget of \$228,200 per year, as it is expected that the compliance rate would increase during these years.

Compliance promotion activities are expected to include mail-outs of the final Regulations, developing and distributing promotional materials (i.e. a fact sheet or Web material), attendance at trade association conferences and presenting workshops/information sessions in order to explain the proposed Regulations. Compliance promotion activities may also include responding to and tracking inquiries in addition to contributing to the compliance promotion database.

In the first year following the coming into force of the proposed

Regulations, compliance promotion activities are estimated to require a budget of \$235,500. In year two, compliance promotion activities would require an estimated annual budget of \$23,000, as activities may decrease in intensity. In year three, compliance promotion activities would be limited to maintenance level and are estimated to require an additional budget of \$6,500. During year four, the intensity of compliance promotion is likely to increase with activities similar to year one requiring an estimated annual budget of \$80,000. During the remainder of the 25-year period, compliance promotion costs are assumed to require an estimated annual budget of \$6,500 each year. It should be noted that the intensity and level of effort associated with these activities may change when compliance analyses are completed or if unforeseen challenges with respect to compliance arise.

Total costs

The present value of total incremental one-time equipment costs to industry is estimated to be \$141.6 million and \$125.3 million for automotive refinishing products. The industry is also estimated to incur an incremental cost of \$55.1 million for training over the 25-year period. The present value of total incremental costs to industry is, therefore, estimated to be \$322 million.

The present value of federal government enforcement costs over the 25-year time frame is estimated to be \$4.5 million, while compliance promotion costs are estimated to be \$0.39 million over the same period. The present value of total costs to the federal government are therefore estimated to be \$4.9 million.

The net present value of total industry and government costs associated with the proposed Regulations are estimated to be approximately \$326.9 million.

The proposed VOC concentration limits for automotive refinishing products are expected to result in a cumulative reduction of 71.2 kilotonnes in VOC emissions over the 25-year analysis period. Therefore, the estimated cost per tonne of VOC emission reduction for the proposed Regulations is \$4,600.

Distributional impacts on the automotive repair shops

The distributional analysis was conducted using data on the number of repair shops that would be impacted in each of the three size categories and across regions. The analysis showed that Quebec has a larger share of small shops with no paint mixing machines (approximately 38%), while the share of medium and large shops in Ontario is higher at approximately 36%. As a result, approximately 34% and 25% of the total costs will be borne by the repair shops in Ontario and Quebec, respectively. It should be noted that the impact on repair shops would be relatively higher in the first two years of the proposed Regulations coming into force. However, it is likely that some support for training would be provided by the automotive refinishing products manufacturers to large repair shops. Since the extent of this support is not known, its impact on automotive repair shops has not been assessed.

Comparing the significance of the incremental costs to average revenues for the three size categories, it is estimated that the incremental cost is less than 1% of average revenue of \$400,000 for small shops without mixing machines. With respect to small repair shops with mixing machines as well as the medium and large shops (with revenue of \$600,000 and \$800,000, respectively), the incremental cost represents a share of 2% to 2.5% of average annual revenue. Considering the assumption that the automotive product manufacturers would provide some training support to the large repair shops in the first year of the proposed Regulations coming into force, it is expected that the magnitude of incremental costs incurred by these repair shops would also be less than 1% of average revenues. While incremental costs represent a relatively small percentage of repair shop revenue, there may be some impacts on profitability. The impact of the proposed Regulations on repair shops²⁰¹⁹; profitability has not been assessed due to the absence of data on operating cost and profit margins.

Impacts on employment

The Canadian automotive refinishing product manufacturers represent a small percentage of the overall market share of these products. While some of the SMEs are expected to be affected by the proposed Regulations, the impacts would likely be negligible. As such, the impacts on employment for manufacturers are not expected to be significant.

Employment in the automotive refinishing and repair sub-sector is also not expected to be significantly affected. The cost impacts may affect the profitability of some repair shops, especially small repair shops in large urban centres, and this could potentially result in closures and personnel lay-offs. However, as the skilled workers employed in this sub-sector are in high demand, they would likely be absorbed by other repair shops.

Competitiveness

The proposed Regulations would set VOC concentration limits on automotive refinishing products manufactured or imported for use in Canada. The multinational companies that dominate the global automotive refinishing products market also dominate the Canadian market. These companies already produce compliant automotive refinishing products for the European and U.S. markets, products that could be supplied to the Canadian market as well. However, Canadian manufacturers may experience increased production costs if, for example, they have to maintain separate production lines for the Canadian and export markets. Such production cost increases may cause the Canadian automotive refinishing products manufacturers to suffer a loss in competitiveness in export markets. Because Canadian manufacturers export a limited volume of products, the impact on competitiveness is expected to be negligible. Moreover, with the United States and the European Union progressively adopting stringent VOC concentration limits for automotive refinishing products, competitiveness would no longer be a concern for these manufacturers.

The majority of automotive refinishing products manufactured by Canadian manufacturers comprise of specialty and niche products (such as truck bed liner coating, temporary protective coating and underbody coating) and are destined for the domestic market. Hence, there may be some domestic competitiveness impacts for these manufacturers. In particular, it is likely that some of the smaller manufacturers may suffer an unequal share of compliance costs relative to other medium-sized companies. Costs are expected to be an important consideration for these small manufacturers during the first years following the coming into force of the proposed Regulations. As a result, the smaller manufacturers might experience a loss in domestic competitiveness. The precise extent to which the unequal share of costs would affect the competitiveness within the SMEs has not been evaluated due to lack of information.

The automotive repair sub-sector in Canada only caters to the domestic market. The magnitude of the competitiveness impact on repair shops is contingent on their ability to absorb the increased costs. The factor restricting repair shops from passing on their increased costs to consumers is the role of the automobile insurance companies. The insurance companies contribute an estimated 58% of all revenues generated by collision and repair shops in Canada, while vehicle owners contribute the balance. The re-organization occurring within the insurance industry is resulting in aggressive cost-cutting efforts in that sub-sector. This has led many collision and repair shops to enter into special or preferred arrangements with insurers that typically reduce their hourly labour rate and revenue per job. The repair shops enter into these agreements with the expectation that the volume of work would increase. However, with the declining trend in accidents and repair jobs, this has not occurred and, in addition, the repair shops are not in a position to increase the repair price. Any repair price increase would mean an increase in insurance premium, and this is unlikely to happen in the short run. The decline in the number of repair jobs results in lower revenues and profit margins for all repair shops.

In general, the incremental cost impacts on repair shops represent a relatively small percentage of revenue and are expected to be manageable. However, there may be conditions under which some repair shops may either close down or consolidate. The factors that could influence closures and consolidations include the ability to pass on increased costs to consumers, the level of support for training received from automotive refinishing product manufacturers, the competition from other repair shops, the location, the profitability, etc. While there may be some adverse impacts, it is not possible to assess them with any degree of confidence due to lack of information.

Impacts on consumers

The proposed Regulations are expected to have some impact on consumers to the extent that repair shops are able to pass on some of the incremental costs through higher prices for repair jobs. There is some uncertainty over the magnitude of the costs that would eventually be paid for by the consumers. However, due to the pressure from insurance companies and the declining trend in accident repair jobs, it is unlikely that a significant increase in repair

costs would result.

Benefits to Canadians

Environment Canada has estimated that the cumulative VOC emission reductions resulting from the proposed Regulations would be 71.2 kilotonnes over the 25 years from 2010 to 2034, with an average annual reduction of 40% per year. These reductions, combined with other VOC emission reduction initiatives proposed under the Government of Canada's Regulatory Framework, are expected to result in an incremental reduction in human and environmental exposure to O₃ and PM. These would result in benefits to

- Human health; reduced incidence of premature death, hospital admissions, doctor visits, emergency room visits, lost work and school days, etc.;
- Agriculture and forestry; improved yields; and
- Environment; reduced damage to the ecosystems.

It is currently not possible to quantify and monetize with confidence the benefits directly associated with the reduction of a tonne of VOC from automotive refinishing products in Canada. The expected magnitude of VOC emission reductions from the proposed Regulations alone do not allow existing models to accurately detect or measure the impact on air quality, and human and environmental health. The interrelationships between different pollutants are non-linear and complex, and it is therefore impossible to isolate the impact of VOC emission reductions from specific sources on air quality and ground-level ozone.

In the United States, the EPA and CARB have been unable to precisely isolate and assess potential impacts associated with reductions in VOC emissions alone, despite a consensus that these impacts exist. Average estimates of the benefits from more broadly defined VOC sources, reported by the U.S. EPA, ([see footnote 19](#)) range widely from \$6,800 to \$18,800 per tonne ([see footnote 20](#)) of VOC emission reductions. More recently, the U.S. Office of Management and Budget (OMB) ([see footnote 21](#)) has published estimates of benefits associated with VOC reductions ranging from approximately \$850 to \$3,840 per tonne. The European Union has also estimated the monetized benefits of reductions for its directive to reduce VOC emissions from paints. ([see footnote 22](#))

Benefit estimates for European Union member states range from \$800 to \$11,600 per tonne of reduced VOC emissions. However, differences in weather patterns, product use, land use, population, population density, architectural value and socio-economic conditions require caution in applying these estimates to the Canadian context.

The estimated low, high and average benefits from the EU and U.S. studies provide evidence of the order of magnitude of potential benefits from reducing VOC emissions.

Table 3: Estimated Benefits From VOC Emission Reductions (in

2006\$/tonne)

Estimate Source	Low	Average	High
U.S. OMB	\$850	\$2,345	\$3,840
EU	\$800	\$3,400	\$11,600
U.S. EPA	\$6,800	\$12,800	\$18,800

Although benefits of VOC reduction from automotive refinishing products alone are impossible to assess, the overall VOC emission reductions expected from all sources identified in the Regulatory Framework would contribute to health and environmental benefits. Benefits of reduced emissions of VOCs are expected to manifest themselves predominantly in urban areas and in particular in regions with persistently low air quality. Reduced human health risks would also translate into lower health care costs to governments across Canada.

In addition to these direct benefits, the proposed Regulations represent an important step by the Government of Canada towards meeting Canada's commitments under the Ozone Annex. Meeting these commitments is critical to Canada's long-term objective of reducing transboundary flows of air pollutants, with significant benefits to human and environmental health.

Conclusions

The cost impacts presented in the preceding sections are summarized in the table below. Without monetized benefit estimates, it is not possible to estimate the net present value of the proposed Regulations. It is expected, however, that in light of the significant adverse health and environmental impacts of ground level O₃, PM and smog, and taking into consideration the benefit of meeting Canada's international commitments under the Ozone Annex, the benefits would exceed the costs.

The table below estimates the sensitivity of the cost estimates to variations in the discount rate.

Table 4: Present Values of Costs (in 2006\$)

	PV _{3%}	PV _{5%}	PV _{7%}
Costs to Industry and Consumers (in million \$)	\$362.4	\$322.0	\$289.8
Cost to Government (in million \$)	\$5.8	\$4.9	\$4.2
Total Cost (in million \$)	\$368.2	\$326.9	\$294.0
VOC Reductions (kilotonnes)	71.2		

Cost per Tonne \$5,170 \$4,600 \$4,130

The present value of total incremental costs of the proposed Regulations is estimated to be \$326.9 million. Over the 25-year period, incremental recurring costs for automotive refinishing products are approximately 38% of the total incremental costs. Any increase or decrease in the price of automotive refinishing products would have a significant impact on total incremental costs of the automotive repair shops. One-time investment in equipment represents approximately 43% of total incremental costs and 17% of the costs would be incurred for training. The cost to federal government represents approximately 2% of the total incremental cost.

The extent to which the automotive repair sub-sector would be able to pass on the incremental costs to consumers through higher prices would determine the ultimate distribution of costs between repair shops and consumers. From a distributional standpoint, the provinces of Ontario and Quebec would bear a larger share of the costs given the larger share of the affected repair shops in these provinces.

The table above shows that estimates of cost per tonne range between \$4,130 and \$5,170. Although on the high side, these estimates, when combined with the other two VOC initiatives, would fall within the benefit per tonne estimated from other jurisdictions, as shown in Table 3. It is expected that estimated benefits per tonne of VOC emission reductions would be comparable in Canada.

While Ontario and Quebec would incur a larger share of the costs, the benefits of reduced VOC emissions are also expected to occur primarily in these regions, in particular within the Windsor-Quebec corridor and in Vancouver. The cumulative VOC emissions from automotive refinishing products with the regulatory requirements in place are estimated to be 71.2 kilotonnes (or an average annual reduction of 40% per year) lower over the 25-year period compared to the estimated emissions in the absence of the proposed Regulations. By reducing the VOC emissions which are precursors to ground-level ozone, the proposed Regulations would result in a reduction in the human health and environmental risk associated with air pollution, especially in the urban areas with high population densities.

Consultation

In May 2006, the discussion document entitled *Discussion Paper for the Development of Regulations Limiting Volatile Organic Compounds in Automotive Refinish Coatings* was published by Environment Canada for public comment, ending on October 31, 2006. The document outlined the proposed automotive product categories, concentration limits and approach for the proposed Regulations. Two consultation meetings were held in May and October 2006 with the purpose of clarifying and obtaining feedback on the proposed VOC concentration limits and regulatory requirements. Representatives from the sub-sector, sub-sector

associations, environmental non-governmental organizations (ENGOs), and government stakeholders participated in the meetings. In order to engage automotive repair shops, the end-users of the automotive refinishing products, and others in the automotive repair sub-sector, Environment Canada gave presentations on the proposed Regulations at various locations across Canada, between September 2006 and May 2007. In total, Environment Canada made presentations to over 100,200 persons working in the automotive refinishing and repair sub-sector. Environment Canada also prepared an information sheet on the proposed Regulations, which was available on-line and widely distributed within the automotive refinishing and repair sub-sector. Stakeholders were generally supportive of the proposed Regulations.

In 2006, the CEPA National Advisory Committee (CEPA NAC) and relevant federal government departments were consulted on the proposed VOC concentration limits and regulatory elements. No major concerns were raised by CEPA NAC.

In addition to comments provided at the various consultation meetings, written comments were also provided by participants. A summary of comments and concerns as they relate to the proposed regulatory requirements raised by the stakeholders and Environment Canada and Health Canada's responses are presented below.

Coming into force

Initially, Environment Canada proposed a coming into force date of January 1, 2009. However, the industry expressed significant concerns over the proposed deadline. They stated that more time would be required for the implementation of the proposed Regulations, particularly for training the automotive repair shop personnel in the use of automotive refinishing products with low VOCs.

Based on this feedback and additional information gathered from the experience in the European Union and certain districts in California on the transition to automotive refinishing products with low VOCs, Environment Canada has delayed the coming into force date by one year, to January 1, 2010.

Impact on small and medium enterprises

Owners and operators of collision repair shops, particularly small and medium enterprises, expressed concern regarding the financial cost associated with the transition to compliant automotive refinishing products. This includes costs for inventory turn-over, new equipment (spray guns and air movement equipment), and training. Automotive refinishing products distributors also expressed concern regarding the cost to dispose of the non-compliant product already purchased and stored in their warehouses.

This issue has been taken into consideration in the proposed Regulations to ensure effective regulations while minimizing costs to the automotive repair sub-sector. Environment Canada also approached other government departments to determine if any

government programs are available to assist with the costs to small business. Environment Canada approached Industry Canada and Human Resources and Social Development Canada to identify government programs available to small businesses for financial assistance. At this time, the Canada Small Business Financing Program (CSBFP) from Industry Canada has been identified to help SMEs get up to \$250,000 in financing for the purchase or improvement of real assets such as land, buildings, equipment and leasehold improvements. Environment Canada will be continuing to work with the industry to identify other possible programs. In addition, as the proposed Regulations do not include any regulatory requirements to manage the final use of the automotive refinishing products, the repair shops would be able to use up any remaining non-compliant product, including colour tints, purchased prior to the effective date of the proposed Regulations. As a result, the impact on SMEs is not expected to be significant. These factors will help reduce the incremental compliance costs in the initial years of the proposed Regulations.

VOC concentration limits

Manufacturers and importers of automotive refinishing products also expressed concerns regarding the proposed VOC concentration limit for adhesion promoter, primer sealers, and single-stage coatings. They stated that it is currently not technically feasible to reformulate these products to meet the proposed requirements.

Environment Canada had proposed low VOC concentration limits for products where previously collected information suggested that product reformulation to meet the proposed limit was technically feasible. However, the information provided by stakeholders and verified by Environment Canada indicated that the technology is currently not available for reformulating the products to meet the VOC concentration limit. Therefore, the VOC concentration limits for adhesion promoter, primer sealers, and single-stage coatings have been increased to a concentration limit which is higher than CARB.

Exemptions

It was also recommended that tertiary-butyl acetate (TBAC) be exempted from VOC definition in Schedule 1 of CEPA 1999. Manufacturers asked for the option to be able to use TBAC as a non-VOC substance when formulating certain types of products in order to comply with the VOC concentration limits.

Environment Canada is currently evaluating TBAC for its VOC emission contribution. It is expected that the evaluation will be available prior to finalizing the proposed Regulations, and Environment Canada would be in a position at that time to make a final decision on whether or not to exempt the substance.

Stakeholders recommended that automotive refinishing products used for the restoration of antique vehicles, such as lacquers, be exempted from the proposed Regulations.

Lacquers are used mainly by hobbyists for restoration of antiques and

represent a small percentage of automotive refinishing products usage. The physical properties of lacquer topcoats make them less desirable than other coating types for refinishing newer vehicles, and their use for new automobiles is decreasing. Moreover, it is not possible to reformulate lacquer topcoats with lower VOC concentration. As a result, Environment Canada has included an exemption for lacquer topcoats in the proposed Regulations. This approach is similar to that of the U.S. EPA, which exempts lacquers from their National Rule.

Other comments

Other questions focused on clarification of the elements being considered, including test methods, compliance, and enforcement of the proposed Regulations. These issues have been addressed by clarifying the proposed regulatory text.

Compliance and enforcement

Since the Regulations would be made under CEPA 1999, enforcement officers will, when verifying compliance with the proposed Regulations, apply the Compliance and Enforcement Policy implemented under the Act. The Policy also sets out the range of possible responses to violations, including warnings, directions, environmental protection compliance orders, ticketing, ministerial orders, injunctions, prosecution, and environmental protection alternative measures (which are an alternative to a court trial after the laying of charges for a CEPA 1999 violation). In addition, the Policy explains when Environment Canada will resort to civil suits by the Crown for costs recovery.

When, following an inspection or an investigation, an enforcement officer discovers an alleged violation, the officer will choose the appropriate enforcement action based on the following factors:

- *Nature of the alleged violation*: This includes consideration of the damage, the intent of the alleged violator, whether it is a repeat violation, and whether an attempt has been made to conceal information or otherwise subvert the objectives and requirements of the Act.
- *Effectiveness in achieving the desired result with the alleged violator*: The desired result is compliance within the shortest possible time and with no further repetition of the violation. Factors to be considered include the violator's history of compliance with the Act, willingness to cooperate with enforcement officers, and evidence of corrective action already taken.
- *Consistency*: Enforcement officers will consider how similar situations have been handled in determining the measures to be taken to enforce the Act.

Environment Canada will monitor VOC concentration limits and compliance with the proposed Regulations.

Contacts

Alex Cavadias
Acting Manager
Products Division
Environment Canada
351 Saint-Joseph Boulevard, 12th Floor
Gatineau, Quebec
K1A 0H3
Telephone: 819-953-1132
Fax: 819-994-0007
Email: Alex.Cavadias@ec.gc.ca

Markes Cormier
Senior Economist
Regulatory Analysis and Instrument Choice Division
Environment Canada
10 Wellington Street, 24th Floor
Gatineau, Quebec
K1A 0H3
Telephone: 819-953-5236
Fax: 819-997-2769
Email: Markes.Cormier@ec.gc.ca

PROPOSED REGULATORY TEXT

Notice is hereby given, pursuant to subsection 332(1) [\(see footnote a\)](#) of the *Canadian Environmental Protection Act, 1999* [\(see footnote b\)](#), that the Governor in Council proposes, pursuant to subsection 93(1) of that Act, to make the annexed *Volatile Organic Compound (VOC) Concentration Limits for Automotive Refinishing Products Regulations*.

Any person may, within 60 days after the date of publication of this notice, file with the Minister of the Environment comments with respect to the proposed Regulations or a notice of objection requesting that a board of review be established under section 333 of that Act and stating the reasons for the objection. All comments and notices must cite the *Canada Gazette*, Part I, and the date of publication of this notice, and be addressed to the Director, Products Division, Department of the Environment, Ottawa, Ontario K1A 0H3.

A person who provides information to the Minister of the Environment may submit with the information a request for confidentiality under section 313 of that Act.

Ottawa, April 10, 2008

MARY PICHETTE
Assistant Clerk of the Privy Council

VOLATILE ORGANIC COMPOUND (VOC) CONCENTRATION LIMITS FOR AUTOMOTIVE REFINISHING PRODUCTS REGULATIONS

INTERPRETATION

Definitions	1. The following definitions apply in these Regulations.
201C;automotive refinishing201D; 00AB; <i>finition automobile</i> 00BB;	201C;automotive refinishing201D; means any activity relating to the service, maintenance, repair, restoration or modification of motor vehicles or mobile equipment, or their parts, involving the application of a coating or surface cleaner.
201C;coating201D; 00AB; <i>rev00EA; tement</i> 00BB;	201C;coating201D; means a product applied to or impregnated into a substrate for protective or any other automotive refinishing purpose. It does not include a lacquer topcoat or products used in carrying out metal plating.
201C;excluded compounds201D; 00AB; <i>compos00E9;s exclus</i> 00BB;	201C;excluded compounds201D; means the compounds excluded under item 65 of Schedule 1 to the <i>Canadian Environmental Protection Act, 1999</i> .
201C;mobile equipment201D; 00AB; <i>00E9;quipement mobile</i> 00BB;	201C;mobile equipment201D; means any equipment, other than a motor vehicle, that is capable of being pulled on a highway.
201C;motor vehicle201D; 00AB; <i>v00E9;hic automobile</i> 00BB;	201C;motor vehicle201D; means any self-propelled vehicle, but does not include <ul style="list-style-type: none"> (a) an aircraft as defined in subsection 3(1) of the <i>Aeronautics Act</i>; (b) rolling stock as defined in section 6 of the <i>Canada Transportation Act</i>; or (c) a boat, ship or craft designed, used or capable of being used solely or partly for navigation in, on, through or immediately above water.
201C;surface cleaner201D; 00AB; <i>nettoyant de surface</i> 00BB;	201C;surface cleaner201D; means a product used to prepare the surface of motor vehicles or mobile equipment by removing unwanted matter from the surface before applying a coating. It does not include products used for cleaning automotive refinishing equipment.
201C;volatile organic compound201D; or 201C;VOC201D; 00AB; <i>compos00E9;s organiques</i>	201C;volatile organic compound201D; or 201C;VOC201D; means a compound that participates in atmospheric photochemical reactions that is not excluded under item 65 of Schedule 1 to the <i>Canadian Environmental Protection Act, 1999</i> .

volatils 00BB; *ou*
00AB; *COV* 00BB
;

APPLICATION

- Application** **2.** (1) Subject to subsection (2), these Regulations apply in respect of any product containing volatile organic compounds set out in column 1 of the schedule, if
- (a) the product is to be used for automotive refinishing; or
 - (b) anywhere on the product's container, or in any documentation relating to the product supplied by the product's manufacturer, importer or seller, or any person acting on their behalf, a representation is made that the product may be used for automotive refinishing.
- Non-Application** (2) These Regulations do not apply to automotive refinishing products set out in column 1 of the schedule that are
- (a) manufactured in Canada for export;
 - (b) imported, offered for sale or sold in a non-refillable aerosol spray container or manufactured to be packaged in that type of container;
 - (c) imported, offered for sale or sold in a container with a volume of 14.8 ml (0.5 fl. oz.) or less or manufactured to be packaged in that size of container;
 - (d) manufactured, imported, offered for sale or sold to be applied to motor vehicles or mobile equipment, or their parts, during manufacture on an assembly line;
 - (e) manufactured, imported, offered for sale or sold to be used as a solvent in a laboratory for analysis;
 - (f) manufactured, imported, offered for sale or sold to be used in scientific research; or
 - (g) manufactured, imported, offered for sale or sold to be used as a laboratory analytical standard.

PROHIBITIONS

- Concentration** **3.** (1) Subject to subsection (2), no person shall

Limit	manufacture or import, offer for sale or sell any automotive refinishing product set out in column 1 of the schedule if its concentration of volatile organic compounds exceeds the limit set out in column 2 of the schedule for that product.
Diluted products	(2) If dilution of a product set out in column 1 of the schedule is required before its use, in accordance with the manufacturer's, importer's or seller's written instructions, the concentration of volatile organic compounds in the diluted product shall not exceed the VOC concentration limit set out in column 2 of the schedule for that product.
Combination of multiple components	(3) For greater certainty, if the manufacturer's, importer's or seller's written instructions require the combination of multiple components before the product's use, the concentration of volatile organic compounds in the product resulting from the combination of the multiple components shall not exceed the VOC concentration limit set out in column 2 of the schedule for that product.
Lowest VOC concentration limit	(4) If anywhere on the container of a coating set out in the schedule, or in any documentation relating to the coating supplied by the manufacturer, importer, seller or any person acting on their behalf, any representation is made that indicates that the coating may be used as another coating set out in the schedule, then the lowest VOC concentration limit applies.

METHODS OF ANALYSIS

CALCULATION OF VOC CONCENTRATION

Automotive refinishing coating

4. (1) The VOC concentration in a coating is determined by the following formula:

$$\text{VOC concentration} = \frac{W_s - W_w - W_{ec}}{V_m - V_w - V_{ec}}$$

where

VOC concentration is the grams of volatile organic compounds per litre of coating, undiluted or diluted before use in accordance with the manufacturer's, importer's, or seller's written instructions;

Ws is the weight of volatiles, in grams;

Ww is the weight of water, in grams;

Wec is the weight of excluded compounds, in grams;

Vm is the volume of coating, in litres;

Vw is the volume of water, in litres; and

Vec is the volume of excluded compounds, in litres.

Test Method 24 2014; US CFR (2) The elements of the formula provided for in subsection (1) are determined in accordance with Test Method 24 of Appendix A-7, Part 60, Chapter 1 of Title 40 of the *Code of Federal Regulations* of the United States, as amended from time to time.

Interpretation of Test Method 24 (3) For the purpose of these Regulations, the reference to US EPA Test Method 24 shall be read as follows:

(a) wherever the expression 201C;exempt solvent201D; is used in that Method, it shall have the same meaning as 201C;excluded compounds201D; in these Regulations; and

(b) section 11.4 of that Test Method is excluded.

Surface Cleaner 5. The VOC concentration in a surface cleaner is determined by the following formula:

$$\text{VOC concentration} = \frac{W_s - W_w - W_{ec}}{V_m}$$

where

VOC concentration is the grams of volatile organic compounds per litre of surface cleaner, undiluted or diluted before use in accordance with the manufacturer2019;s, importer2019;s or seller2019;s written instructions;

Ws is the weight of volatiles, in grams;

Ww is the weight of water, in grams;

Wec is the weight of excluded compounds, in grams; and

Vm is the volume of surface cleaner, in litres.

ACCREDITED LABORATORY

Accredited laboratory **6.** Any laboratory that performs an analysis for the purposes of these Regulations shall be accredited under the International Organization for Standardization standard ISO-IEC 17025: 2005, entitled *General requirements for the competence of testing and calibration laboratories*, as amended from time to time, its accreditation shall include the analysis in question within its scope of testing.

LABELLING

Date code **7.** (1) A person who manufactures, imports, offers for sale or sells any product to which these Regulations apply, shall include on the containers in which the product is offered for sale or sold, the date on which the product was manufactured or a code representing that date.

Information on request (2) A person who manufactures, imports, offers for sale or sells any product to which these Regulations apply shall provide the Minister, on request, with an explanation of any code used on the product's container to represent the date of manufacture.

Instructions for dilution **8.** (1) If a product set out in column 1 of the schedule requires dilution before its use, the manufacturer, importer or seller shall ensure

(a) that the product's label or the accompanying documentation specifies the instructions for dilution in both official languages; and

(b) that any instructions for dilution appearing on the product's label or in any accompanying documentation does not provide for dilution of the product to a concentration greater than the VOC concentration limit set out in column 2 of the schedule for that product.

Instructions for combination (2) If a multiple component product requires that components be combined before its use, the manufacturer, importer or seller shall ensure that the product's label or the accompanying documentation specifies the instructions for the recommended combinations in both official languages.

RECORD KEEPING

Required information **9.** (1) Every person who manufactures or imports a product set out in the schedule shall keep a record including the results of any analysis conducted in accordance with these Regulations, the name and civic address of the laboratory that performed the analysis and any supporting documents related to the analysis for a period of at least five years, beginning on the date of the analysis.

Place and time limit (2) The record shall be kept at the person's principal place of business in Canada or at any other place in Canada where the information, results and supporting documents can be inspected. If the record is kept at any place other than the person's principal place of business, the person shall provide the Minister with the civic address of the place where they are kept.

COMING INTO FORCE

January 1, 2010 **10.** These Regulations come into force on January 1, 2010.

SCHEDULE
(Sections 2 and 3)

VOC CONCENTRATION LIMITS FOR PRODUCTS SUBJECT TO THESE REGULATIONS

Item Column 1	Column 2
Product and Description	VOC Concentration Limit (g/l)

COATINGS

1.	Primer Surfacer	250
----	-----------------	-----

A coating applied for corrosion resistance, adhesion of subsequent coatings or to fill in surface imperfections. Adhesion promoters are not included in this category.

2.	Primer Sealer	340
----	---------------	-----

A coating applied before the application of another coating for the purpose of colour uniformity or to prevent a subsequent coating from penetrating underlying coatings.

3.	Pre-Treatment Wash Primer	660
----	---------------------------	-----

A coating that contains a minimum of one-half (0.5) percent acid by weight and not more than 16 percent solids by weight that is designed to be applied directly to bare metal surfaces to provide corrosion resistance and to facilitate adhesion of subsequent coatings.

4. Adhesion Promoter 840

A coating applied to uncoated plastic surfaces to facilitate adhesion of subsequent coatings.

5. Colour Coating 420

A pigmented coating applied to a primer or an adhesion promoter that requires a subsequent clear coating. This category includes metallic or iridescent colour coatings.

6. Uniform Finish Coating 540

A coating applied to an area of repair for the purpose of blending it to match the finish of the rest of the surface.

7. Truck Bed Liner Coating 310

A coating that protects a truck bed from surface abrasion. Colour coatings, multicolour coatings and single-stage coatings are excluded.

8. Temporary Protective Coating 60

A coating that temporarily protects certain areas from overspray or mechanical damage.

9. Underbody Coating 430

A coating designed to be applied to the wheel wells, the inside of door panels or fenders, the underside of a trunk or hood or the underside of a motor vehicle.

10. Single-Stage Coating 420

A pigmented coating designed to be

applied without a subsequent clear coat.
Single-stage coatings include single-stage
metallic or iridescent colour coatings.

11. Multicolour Coating 680

A coating that exhibits more than one
colour in the dried coat after a single
application, hides surface defects and is
applied over a primer or adhesion
promoter. This category includes metallic
or iridescent multicolour coatings.

12. Clear Coating 250

A coating that contains no pigments and is
designed to be applied over any other
coating.

13. Other Coatings 250

All other coatings not described in this
schedule.

SURFACE CLEANERS

14. Surface Cleaners 50

[17-1-o]

[Footnote 1](#)

For further information, visit the Web site at
[www.ec.gc.ca/pdb/cac/Emissions1990-
2015/EmissionsSummaries/VOC_e.cfm](http://www.ec.gc.ca/pdb/cac/Emissions1990-2015/EmissionsSummaries/VOC_e.cfm).

[Footnote 2](#)

Environment Canada, *Discussion Paper for the Development of
Regulations Limiting Volatile Organic Compounds in Automotive
Refinish Coatings*, 2006
(www.ec.gc.ca/nopp/voc/docs/autoRef/en/autoref_e.pdf)

[Footnote 3](#)

For further information, visit the Web site at
www.arb.ca.gov/coatings/autorefin/scm/resolution-scm.pdf.

[Footnote 4](#)

Chemical reaction activated by sunlight.

[Footnote 5](#)

Krewski, D.; Burnett, R.; Jerrett, M.; Pope, C. A.; Rainham, D.;
Calle, E.; Thurston, G., and Thun, M. 201C; Mortality and long-term
exposure to ambient air pollution: ongoing analyses based on the
American Cancer Society cohort. 201D; J Toxicol Environ Health A.

2005 Jul 9-2005 Jul 23; 68(13-14):1093-109.

[Footnote 6](#)

Krewski, D.; Burnett, R. T.; Goldberg, M.; Hoover, K.; Siemiatycki, J.; Abrahamowicz, M.; Villeneuve, P. J., and White, W. 201C;Reanalysis of the Harvard Six Cities Study, part II: sensitivity analysis.201D; Inhal Toxicol. 2005 Jun-2005 Jul 31; 17(7-8):343-53.

[Footnote 7](#)

U.S. Environmental Protection Agency, Fact Sheet, EPA2019;s Revised Ozone Standard, July 17, 1997
(www.epa.gov/ttn/oarpg/naaqsfm/o3fact.html)

[Footnote 8](#)

As per section 64 of CEPA, VOCs were found to be toxic as they were entering the environment in a quantity or concentration, or under conditions that (a) have or may have an immediate or long-term harmful effect on the environment or its biological diversity, and (c) constitute a danger in Canada to human life or health.

[Footnote 9](#)

For further information, visit the Web site at www.ec.gc.ca/cleanair-airpur/CAOL/air/can_usa_e.html.

[Footnote 10](#)

For further information, visit the Web site at www.ec.gc.ca/nopp/DOCS/notices/voc/en/index.cfm.

[Footnote 11](#)

For further information, visit the Web site at www.ec.gc.ca/Ceparegistry/documents/notices/g1-14042_n1.pdf.[Footnote](#)

[Footnote 12](#)

For further information, visit the Web site at www.ec.gc.ca/doc/media/m_124/report_eng.pdf.[Footnote](#)

[Footnote 13](#)

For further information, visit the Web site at www.ec.gc.ca/doc/media/m_124/p1_eng.htm.[Footnote](#)

[Footnote 14](#)

For further information, visit the Web site at www.epa.gov/ttn/atw/183e/arc/fr1194.pdf.

[Footnote 15](#)

Environment Canada, *Discussion Paper for the Development of Regulations Limiting Volatile Organic Compounds in Automotive Refinish Coatings*, 2006
(www.ec.gc.ca/nopp/voc/docs/autoRef/en/autoref_e.pdf).

[Footnote 16](#)

00A0;Krewski, D.; Burnett, R.; Jerrett, M.; Pope, C. A.; Rainham, D.; Calle, E.; Thurston, G., and Thun, M. 201C;Mortality and long-term exposure to ambient air pollution: ongoing analyses based on the American Cancer Society cohort.201D; J Toxicol Environ Health A.

2005 Jul 9-2005 Jul 23; 68(13-14):1093-109. 16Krewski, D.; Burnett, R.; Jerrett, M.; Pope, C. A.; Rainham, D.; Calle, E.; Thurston, G., et Thun, M.
00AB; Mortality and long-term exposure to ambient air pollution: ongoing analyses based on the American Cancer Society cohort 00BB; J Toxicol Environ Health A. 9 juillet 2005-23 juillet 2005; 68(13-14):1093-109.

[Footnote 17](#)

Environment Canada, *Discussion Paper for the Development of Regulations Limiting Volatile Organic Compounds in Automotive Refinish Coatings*, 2006
(www.ec.gc.ca/nopp/voc/docs/autoRef/en/autoref_e.pdf)

[Footnote 18](#)

Cheminfo Services Inc., *Technical Study of Coatings and Operations for Re-finish of Automobiles and Mobile Equipment in Canada*, 2006

[Footnote 19](#)

.S. EPA, 201C; Marginal Damage Estimates for Air Pollutants, 201D; original source: *Federal Purchasing Categories Ranked by Upstream Environmental Burden: An Input/Output Screening Analysis of Federal Purchasing*, 1998

[Footnote 20](#)

All values are in 2006 Canadian dollars per metric tonne. 00A0;

[Footnote 21](#)

U.S. Office of Management and Budget: 201C; Informing Regulatory Decisions: 2004 Draft Report to Congress on the Costs and Benefits of Federal Regulations and Unfunded Mandates on State, Local, and Tribal Entities, 201D; December 2004, p. 34

[Footnote 22](#)

European Union, 201C; The Costs and Benefits the Reduction of Volatile Organic Compounds from Paints, Final Draft, 201D; May 2, 2002 00A0;

[Footnote a](#)

S.C. 2004, c. 15, s. 31

[Footnote b](#)

S.C. 1999, c. 33 