

**Evaluation of Low-VOC Content as  
an Environmental Attribute for  
Inclusion in the FLIS  
Database System**

May 28, 1999

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## Chapter 1: Introduction

The federal government must comply with laws, Executive Orders (EOs), and various policies designed to reduce waste and minimize the environmental impacts of its activities. Federal agencies can minimize the use of hazardous or toxic substances, promote the use of recycled materials, improve energy efficiency, reduce the volume of waste for disposal, conserve natural resources, improve worker health and safety, reduce operating costs, and save taxpayer dollars via the procurement of environmentally oriented products.

The Federal Logistics Information System (FLIS) is the centerpiece of the federal acquisition process. The FLIS is a large database that catalogues almost 7 million records of products and services available in the federal supply system. All federal agencies use FLIS to requisition items through the General Services Administration (GSA) and Defense Logistics Agency (DLA). In February of 1997, the Joint Logistics Commanders (JLC) tasked the DLA to research the feasibility of adding environmental attributes to the FLIS to aid procurement personnel and end-users in identifying products with positive environmental attributes. The JLC asked DLA to identify environmental data currently available and possible constraints for adding environmental attributes to FLIS codes; develop cost estimates for expanding FLIS; and make recommendations on how procurement personnel can identify products that have a lesser impact on human health and the environment. DLA accepted this task and conducted a business case analysis that analyzed the potential costs and benefits of using the FLIS to increase the federal acquisition of environmentally oriented products. Exhibit 1 highlights the benefits of an expanded use of environmentally preferable products that were identified in the business case analysis.

**Exhibit 1**  
**Benefits of an Expanded Use of**  
**Environmentally Preferable Products**

- Reduced operating and disposal costs for facilities
- Reduced exposure to hazardous materials, safety hazards, and environmental violations
- Compliance with regulations and executive orders directing increased federal purchasing of environmentally preferable products
- Achievement of DoD affirmative procurement goals

As a result of the business case analysis, DLA established the Environmental Attribute Initiative and formed the Joint Group on Environmental Attributes (JG-EnvAtt) Coordinating Committee to manage the environmental attribute initiative. The committee is headed by the DLA, with other primary stakeholders being the Army, Navy, Air Force, Marine Corps, and the General Services Administration (GSA). Advisors include the Environmental Protection Agency (EPA), Department of Energy (DOE), and other government agencies. The JG-EnvAtt is responsible for selecting priority attributes for evaluation, approving proposed attributes for inclusion in the FLIS, and adding the approved attribute to the FLIS. The committee has developed three selection criteria for evaluating the proposed attributes for inclusion in the FLIS:

- A regulatory or policy priority must exist;
- A comprehensive definition must be available; and
- A cost benefit must be evident.

The JG-EnvAtt committee identified and prioritized 35 potential environmental attribute categories. Two of these attributes, “energy efficient” and “EPA Comprehensive Procurement Guidelines” have been analyzed previously and an evaluation of their applicability for inclusion in FLIS has been presented to the committee. Draft evaluations of “Non-Ozone Depleting Substances” and “Water Conserving” environmental attributes have been submitted to DLA. Additionally, the FLIS has been modified and prepared to receive environmental attribute data as of September 1998. In November 1998 JG-EnvAtt tasked Litton-PRC and PPC to evaluate three additional categories:

- Low volatile organic compounds content;
- Non-greenhouse impact; and
- Recycled material content.

The purpose of this report is to evaluate *low volatile organic compounds (VOC) content* as an environmental attribute for inclusion in FLIS. This report highlights the underlying policy priorities, provides standard definitions, and presents associated life-cycle costs of *low VOC content* as an environmental attribute. Litton-PRC and Project Performance Corporation (PPC) prepared this report, with the assistance and guidance of the JG-EnvAtt Coordinating Committee.

## Chapter 2: Evaluation Approach

Federal procurement agencies have initiated activities to encourage the procurement of environmentally preferable products. Various catalogs and guides have been developed for the procurement of environmentally preferable alternatives to conventional products; however, existing catalogs are not linked to the FLIS, which characterizes over 7 million items by over 240 codes, including national stock number, manufacturer, procuring agency, and price. These elements, which define the product's "form, fit, and function," assist the procurement personnel and end-users in choosing items that are appropriate for their need.

The DLA defines environmentally preferable as products or services that have a *"lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose."* The comparison of environmentally preferable products with other products may consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, and/or disposal of the product or service.

Incorporating positive environmental attributes in the FLIS will increase the visibility and procurement of environmentally preferable products. The use of environmentally preferable products will minimize the use of hazardous/toxic substances, improve energy efficiency, promote the use of recycled materials, and conserve natural resources.

### Evaluation Criteria

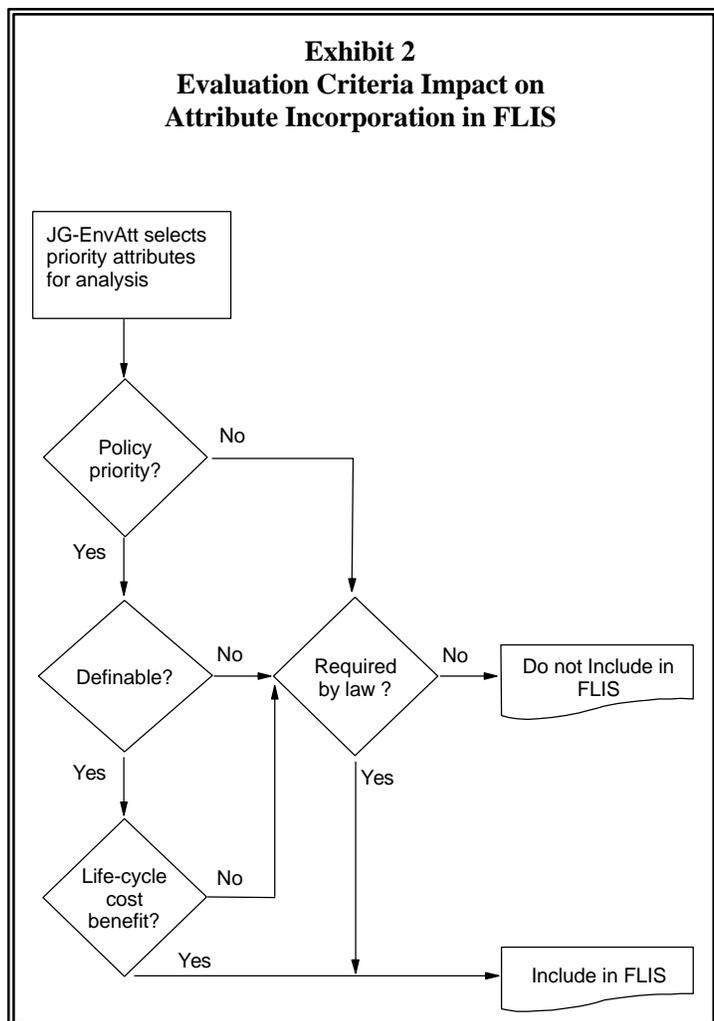
The process of selecting and including potential environmental attributes in FLIS involves evaluating each attribute against three selection criteria:

- Be a policy priority;
- Clearly definable; and
- Show a life-cycle cost benefit.

Exhibit 2 illustrates how these criteria impact whether an attribute is incorporated into the FLIS system.

#### Policy priority?

A potential environmental attribute must have a federal policy priority. On the largest scale, compliance is required under federal environmental laws,



regulations, and executive orders. Additionally, federal procurement personnel must comply with Federal Acquisition Regulations (FAR), which provide further direction concerning implementation requirements contained in regulations and EOs. Finally, departmental policies or initiatives may exist that govern affirmative procurement of environmentally oriented products. Environmental stewardship programs and green design projects may also affect procurement decisions. All of these environmental laws, regulations, policies, and initiatives indicate that a particular environmental initiative is a priority both from the policy standpoint and a public consciousness standpoint.

#### Definable?

If an environmental attribute proves to be a policy priority, it must be clearly defined. The intent of adding environmental attributes to the FLIS is to contribute to the procurement personnel's understanding of the product and why it is preferable to a similar product without the environmental attribute. Procurement personnel must be able to identify products with these attributes from similar products available in the database. The environmental attribute field must contribute information that is understandable, and capable of distinguishing between products of similar form, fit, and function. Therefore, the attribute definitions must be unambiguous and include some quantifiable characteristic.

#### Show a cost benefit?

Provided the environmental attribute is both a policy priority and definable, it now must be shown to provide a cost benefit when compared to similar products without the environmental attribute. Information concerning cost-effectiveness of an environmental attribute may be found in regulatory impact analyses and in governmental and non-governmental cost studies.

Additionally, a life-cycle cost assessment may be beneficial and/or required as a means of acquisition planning. The cost assessment tracks the costs associated with a particular product from procurement through use, handling and disposal.<sup>1</sup> Often, a higher initial purchase price for environmentally oriented products is off-set by reduced costs associated with:

- Material storage and handling;
- Use of energy, water, and other resources;
- Waste storage, treatment, and disposal;
- Compliance, permitting, and reporting; and
- Liability for work-related injuries and environmental contamination.

In other cases, the results of the cost assessment may be overridden by the requirements of a federal directive or agency policy.

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<sup>1</sup> This analysis does not evaluate the cost associated with manufacturing environmentally preferable products relative to other products. Any costs incurred prior to procurement are excluded from this evaluation.

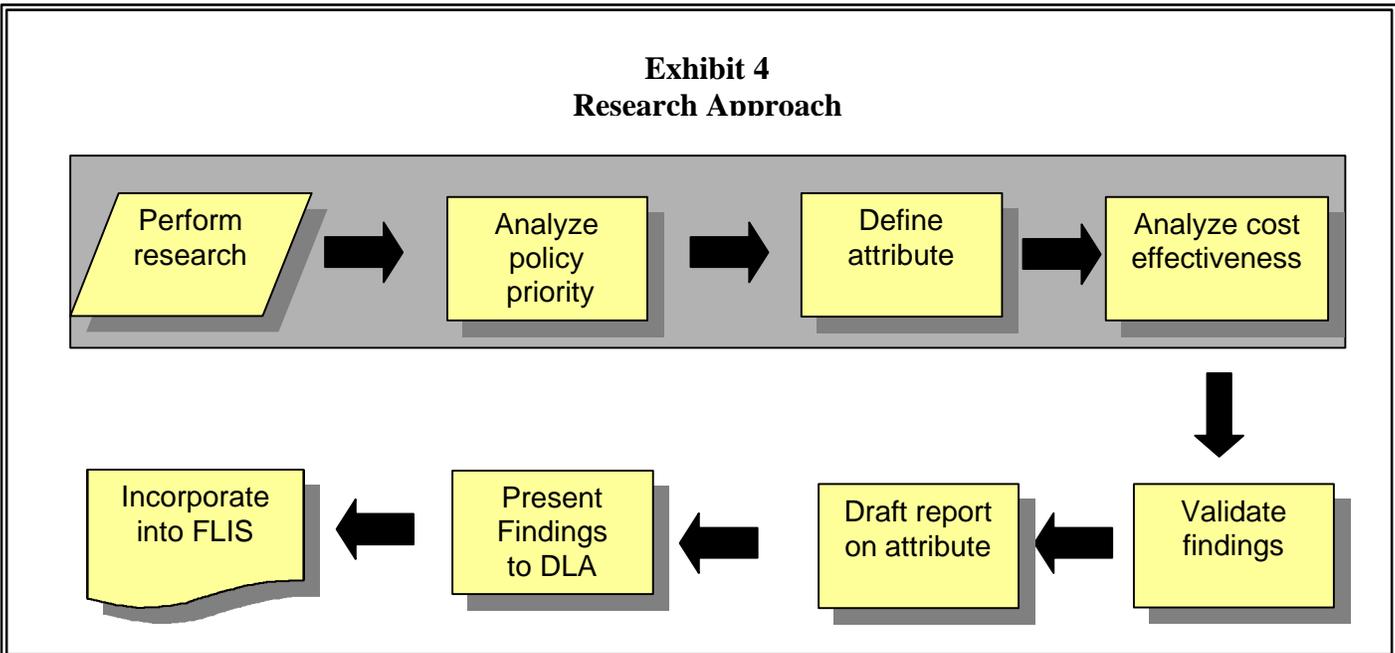
**Approach**

This report documents the multi-step process used to evaluate *low VOC content* as an environmental attribute. First Litton-PRC and PPC researched government, industrial, and international regulations, policies, and definitions to determine if a policy priority exists for the proposed attribute. Some of the primary sources used for this analysis are listed in Exhibit 3.

A definition of the attribute was developed based upon this research and validated by subject matter experts at EPA and other federal agencies. For some potential attributes, the existing definitions are vague, originate from numerous sources, and are inconsistent. In order to ensure that any interpretation of the existing definitions remained consistent with the common, accepted definition, the project team asked experts in the subject to validate the definitions established.

Upon validation of the established definition, additional research was conducted on the attribute’s life-cycle cost impacts. The overall process used to research the selected environmental attribute is presented in Exhibit 4.

- Exhibit 3**  
**Primary Research Sources**
- Laws and regulations
  - Executive Orders
  - DoD affirmative procurement goals
  - EPA Partners for the Environment Programs
  - Interest group studies
  - International standards
  - Regulatory impact analyses
  - Governmental and NGO cost studies
  - DLA inventory control points
  - FTC guides for the use of environmental marketing claims (16 CFR Part 260)
  - Scientific certification systems - lists of certified products and claims
  - ISO 14020 - Guiding Principles for Environmental Labeling Programs (Draft)



## Chapter 3: Low VOC Content

Volatile organic compounds<sup>2</sup> (VOCs) contain carbon, the basic chemical element found in living organisms. Because of their carbon content, VOCs are classified as organic. Unlike other organic compounds, however, VOCs easily vaporize into the air and are a component of photochemical reactions that cause smog. There are many sources of VOCs, including cars, trucks, factories, and household products such as paints, cleaning chemicals, and insecticides.

Once released into the atmosphere, VOCs become a part of a chemical reaction that is stimulated by sunlight and temperature. This photochemical reaction results in the formation of atmospheric (or ground-level) ozone. The environmental impact resulting from ozone, which is a gas molecule consisting of three oxygen atoms (O<sub>3</sub>), differ significantly if the molecules exist in the stratosphere or in the atmosphere. Stratospheric ozone is found between approximately 10-50 km above the earth's surface and protects the earth from ultra-violet radiation from the sun; atmospheric ozone occurs near the surface of the earth and is one of the major components of smog. Because VOCs create atmospheric ozone, these compounds directly contribute to the formation of smog. The environmental attribute *low VOC content* relates to a product's ability to form atmospheric ozone.

Smog causes harmful health effects in humans (e.g., lung irritation and decreased lung function); consequently, the EPA has targeted those compounds that form smog for reduction. The 1990 Clean Air Act includes a list of 189 hazardous air pollutants that are considered potential health and/or environmental hazards. The EPA identified categories of sources that release the 189 chemicals and issued regulations for reducing these sources. Air toxic releasers are identified as either major (large) or area (small) sources.<sup>3</sup> VOC emissions are categorized as area sources and the EPA regulates these emissions in three area source designations:

- Household consumer products - 24 categories of products
- Architectural paints and coatings - 61 types
- Automobile paints and coatings - 7 types

The EPA reduces overall VOC emissions by limiting the VOC content of the targeted products. The VOC content limits are listed as weight-percent VOC, weight-percent HVO<sub>C</sub>, grams per start, or grams of VOCs per liter of product, depending on the product type.<sup>4</sup>

### Is it a Policy Priority?

Research indicates that *low VOC content* is a policy priority due to the existence of national and state policies:

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<sup>2</sup> EPA defines VOCs in 40 CFR 51 subpart F as “any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions.”

<sup>3</sup> Source categories include gasoline service stations, chemical plants, electrical repair shops, etc.

<sup>4</sup> HVO<sub>C</sub> is a High-volatility organic compound one with a vapor pressure greater than 80 millimeters of mercury at 20 °C. A gram per start is the unit of measure for charcoal lighter material.

- The 1990 Clean Air Act – Sets the stage for the identification and regulation of hazardous air pollutants.
- The Pollution Prevention Act (PPA)– Establishes pollution prevention as the public policy of the United States. The Act states that pollution should be prevented or reduced at the source wherever feasible; when pollution is not preventable, it should be recycled or treated in an environmentally safe manner.
- Executive Order 12856 – Requires federal agencies to comply with the PPA of 1990 by developing management and acquisition programs that promote pollution prevention.
- Executive Order 12873 – Requires the Federal government to make more efficient use of natural resources by maximizing recycling, preventing waste, and using and procuring environmentally preferable products and services.
- States VOC emissions regulations – Several states regulate limits for hazardous air pollutants in various household consumer and commercial products, as well as, for specific industries.<sup>5</sup>

Each of these initiatives and their impact on or support of *low VOC content* as an environmental attribute is discussed in further detail in the following sections.

### Clean Air Act

The Clean Air Act (CAA), enacted in 1970, is the comprehensive federal law that regulates air emissions from area, stationary, and mobile sources. The 1990 amendment to the Clean Air Act addresses issues such as acid rain, ground-level ozone, stratospheric ozone depletion, and air toxics. Section 183 of the CAA specifically addresses federal ozone measures, detailing control technique guidelines for VOC sources and prioritizing source categories identified as making the most significant contribution to the formation of ozone air pollution. Subsection (e) addresses VOCs in consumer and commercial products.

The 1990 Amendments provide for the study of emissions of VOCs from consumer and commercial products to determine if these products should be regulated. The products that EPA subsequently targeted for regulation are estimated to account for at least 80% of VOC releases. EPA's proposed methods of reducing VOC releases included labeling, repackaging, chemical formula changes, and fees.

In August 1998, the EPA issued final rules to regulate VOC emissions from various consumer products and paints. EPA stipulated specific VOC content limits based on product or paint type. The federal VOC content limits for the three product groups, consumer products, architectural coatings and automobile refinish coatings and are provided in Appendix A.

### Pollution Prevention Act

The policy of the PPA is stated as follows:

The congress hereby declares it to be the national policy of the United States that pollution should be prevented or reduced at the

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<sup>5</sup> California, Connecticut, Massachusetts, New Jersey, New York, Oregon, Rhode Island, and Texas

source whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.

This focus of the PPA is to reduce the amount of pollution through cost-effective changes in production, operation, and raw materials use. Pollution prevention (P2) also includes other practices that increase efficiency in the use of energy, water, or other natural resources, and protect the resource base through conservation. These goals are achieved through practices such as recycling, source reduction, and sustainable agriculture. Limiting or reducing VOC emissions supports the P2 goals.

#### Executive Order 12856

Executive Order 12856 was signed August 4, 1993 and tasks federal agencies with complying with the PPA of 1990. Federal agencies focus facility management and acquisition activities so as to reduce overall pollution levels. The implementation guidelines stipulate a toxic chemical reduction goal of 50 percent from 1993 baseline levels by December 31, 1999. Based on conversations with Navy and Air Force personnel, the Department of Defense's process for attaining the P2 goal consisted of identifying the top 10 list of pollutants for each facility and reducing or eliminating their use. As a result, the 50% reduction goal for many of the target pollutants has already been met or exceeded. VOCs are frequently included on pollutant reduction lists; consequently, many facilities are continually searching for products that contain lower VOC content levels.

#### Executive Order 12873

Executive Order 12873, which details federal acquisition, recycling, and waste prevention, was signed on October 20, 1993. Emphasis is placed on the acquisition of "environmentally preferable" products and services. For example, a lower VOC content paint would be preferable to a comparable paint with a higher VOC content.

#### States VOC Emission Regulations

Eight states are currently enforcing stricter VOC content limits, than the federal standards, for various categories of consumer products.<sup>6</sup> California's South Coast Air Quality Management District (SCAQMD) is the strictest of the state regulations for VOCs and other hazardous air pollutants. California's VOC limits are discussed further in the following section.

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<sup>6</sup> Eight states (California, Connecticut, Massachusetts, New Jersey, New York, Oregon, Rhode Island, and Texas) are currently enforcing VOC standards for various categories of consumer products. California regulations are detailed in this paper because overall they are the strictest.

## Attribute Definition

The most definitive criteria associated with VOC content come from the Federal maximum limits for VOCs, which EPA promulgated in accordance with section 183 (e) of the Clean Air Act. These Federal regulations stipulate maximum VOC content levels for products in three groups: household consumer products, architectural coatings, and automobile refinish coatings (see Appendix A). These limits currently delineate between products that have an acceptably low VOC content and those that must not be manufactured or imported for sale or distribution in the United States and its territories. Because these Federally mandated limits apply to all commercially available products, there is no distinguishable difference between products in the FLIS. In addition, because these limits are already in effect and mandated by law, they do not need to be incorporated into the FLIS; all products that federal agencies purchase already meet these requirements.

There are existing state regulations that require products to have a lower VOC content than Federal regulations permit. Eight states currently enforce VOC standards for various categories of consumer products. These state regulations must be at least as strict as the federal standards already described.

To distinguish between products in the FLIS that simply meet federal requirements and those that have an even lower VOC content, DLA could use state regulations as the basis for defining the environmental attribute *low VOC content*. If DLA determines that state regulations are an acceptable basis for the environmental attribute *low VOC content*, our recommendation would be to use California State regulations. California hazardous waste and pollution prevention regulations are not only more stringent than federal regulations, but they also have the national reputation of leading the country in environmental protection, often setting precedence for other states to follow.

California air regulations vary across the state by district. The VOC limits presented in this document represent the South Coast Air Quality Management District (SCAQMD). When the California laws were enacted, the VOC limits were generally the same as those required under federal law but California phased in more restrictive VOC content limits over time.

If DLA determines that California State regulations provide an acceptable basis for defining the environmental attribute *low VOC content*, a general unambiguous definition can be developed. The following definition of *low VOC content* is based on California regulations, which are summarized in Exhibit 5:

*Any product that meets the VOC content requirements that are established in the California (SCAQMD) Source Specific Standards and are more strict than the Federal VOC content limits, established per the CAA Section 183 (e).*

**Exhibit 5**  
**Comparison of VOC Content Limits**  
 (Where VOC content limits are specified by both federal and California Regulations and California Regulations have stricter VOC content limits.)

Product Type	Federal VOC Content Limit	California VOC Content Limit
<b>Consumer Products</b>		
Air fresheners-single phase aerosols	70% VOC by weight	30% VOC by weight
Automotive windshield washer fluids	35% VOC by weight	10% VOC by weight
Engine degreasers	75% VOC by weight	50% VOC by weight
Glass Cleaners-nonaerosols	8% VOC by weight	6% VOC by weight
Hairsprays	80% VOC by weight	55% VOC by weight
Nail polish removers	85% VOC by weight	75% VOC by weight
Dusting aids-aerosol	35% VOC by weight	25% VOC by weight
Fabric protectants	75% VOC by weight	60% VOC by weight
Insecticides-crawling bug	40% VOC by weight	20% VOC by weight
Underarm antiperspirant-aerosol	60% HVOC by weight	10% HVOC by weight
Underarm deodorant-aerosol	20% HVOC by weight	10% HVOC by weight
<b>Architectural Coatings</b>		
Bituminous coatings	500 g/l	420 g/l
Bond breakers	600 g/l	350 g/l
Faux finishing/glazing	700 g/l	350 g/l
Fire retardant coatings-clear	850 g/l	650 g/l
Fire retardant coatings-pigmented/opaque	450 g/l	350 g/l
Flat coatings interior and exterior	250 g/l Interior 50 g/l Exterior	50 g/l by 2008
Industrial maintenance coatings	450 g/l	420 g/l
Lacquers	680 g/l	275 g/l by 2005
Magnesite cement coatings	600 g/l	450 g/l
Multi-color coatings	580 g/l	250 g/l
Quick-dry enamels	450 g/l	400 g/l
Varnishes	450 g/l	350 g/l
Wood preservatives-below ground	550 g/l	350 g/l
Wood preservatives-other	550 g/l clear/semi-transparent 350 g/l opaque 120 g/l low solids	350 g/l
<b>Automobile Refinish Coatings</b>		
Primer/Primer Surfacer	580 g/l	250 g/l
Primer Sealer	550 g/l	340 g/l
General topcoat	600 g/l single/two-stage 630 g/l more than two stages	420 g/l

### FLIS Product List

The above definition of the attribute, *low VOC content*, will affect several types of products currently available through the FLIS product catalog. Exhibit 6 identifies typical products that may emit VOCs and are currently purchased through the FLIS.

**Exhibit 6**  
**Products Purchased Through FLIS that May Contain Regulated VOC Content Limits**

Federal Stock Class (FSC) Number	Description	Inventory Control Point
6840	Pest control agents and disinfectants	Richmond, VA
7910	Floor Polishers and Vacuum Cleaning Equipment	Fort Worth, TX
7930	Cleaning and polishing compounds and preparations	Fort Worth, TX
8010	Paints, Dopes, Varnishes and Related	Kansas City, MO
8020	Paint and Artists' Brushes	Kansas City, MO
8030	Preserv and Sealing Compounds	Kansas City, MO
8040	Adhesives	Kansas City, MO

The use of the environmental attribute *low VOC content* in the FLIS will simplify the choices that federal procurement personnel must make during day to day operations.

### Life-Cycle Cost Assessment

EPA predicted in its Final Rule on the National Volatile Organic Compound Emission Standards that establishing a set of product-specific standards for VOC content would result in the following cost implications for affected products:

- Manufactures will bear the costs associated with the reformulation or withdrawal of products that do not meet VOC content limits.
- The total annualized cost for compliance is approximately \$27 million in 1991 dollars.
- The price effects in each market vary from no effect to an estimated 3 % price increase.
- The total social costs are \$17-23 million, which falls below the 1% of baseline revenue for the affected industry sectors.

EPA also determined that a significant proportion of subject products had been reformulated at the time that EPA promulgated its Final Rule in response to State regulations and in anticipation of Federal regulations. These Federal regulations related to VOC content limits apply to all producers of products containing VOCs that are available in the United States and its territories.

Federal VOC content limits are enforced by law; therefore, DLA will purchase VOC compliant products regardless of the life-cycle cost implications. However, if DLA determines that State regulations are an appropriate basis for developing the definition of the *low VOC content* environmental attribute, it is important to evaluate the life-cycle costs of purchasing products that meet this definition. The California EPA recently promulgated amendments to the California Code of Regulations that reduced the allowable VOC emissions from aerosol coatings, antiperspirants and deodorants, and consumer products. As part of the amendment process, California EPA conducted an evaluation of the economic impacts associated with complying with the proposed regulations.

California EPA evaluated the potential impacts on profitability and other aspects of businesses

subject to the proposed limits, the cost-effectiveness of the limits, and the estimated cost impacts to consumers. Based on this analysis, California EPA expects that compliance with these regulations would increase the cost of production. However, California EPA also expects most manufactures to be able to absorb added costs without an adverse impact on their profitability. In evaluating the cost-effectiveness, California EPA evaluated the regulation's efficiency in reducing a given amount of pollutant, generally stated in "dollars (to be) spent per pound of VOC reduced." Based on their evaluation, California EPA estimated the cost-effectiveness of the aerosol coatings regulations to range from less than \$1.00 to about \$3.00 per pound of VOC reduced, with an overall average cost-effectiveness estimated at \$1.57 per pound of VOC reduced. California EPA estimates that the increase of cost per unit for the consumer will range from no cost to approximately \$0.20 per unit.

California EPA did not conduct a study to determine if higher initial purchase price for environmentally oriented products would be off-set by other reduced costs (e.g., associated with reduced health care costs resulting from less smog). Based on the California EPA's evaluation, it is clear that that reducing the volume of VOCs released into the atmosphere results in a higher initial cost. It is not clear whether selection of products that have a *low VOC content*, as defined in this document, would result in a life-cycle cost benefit.

## Chapter 4. Summary and Conclusions

The JG-EnvAtt Coordinating Committee's approach for adding environmental attributes to the FLIS is to identify and evaluate potential environmental attributes based on their policy priority, definability, and life cycle cost savings. This approach was used to evaluate the environmental attribute *low VOC content*.

This environmental attribute is strongly supported by federal policies, including the Clean Air Act, the Pollution Prevention Act, Executive Orders 12856 and 12873, and various state VOC emissions regulations. However, there is no national precedence for defining the environmental attribute *low VOC content*. If DLA determines it is appropriate to define an environmental attribute based on State regulations, our recommendation is to use California regulations, which are generally more strict than other states. The definition of *low VOC content* provided in this paper is derived from compliance with VOC content limits established in California regulations, when these limits are more strict than existing Federal standards.

Law mandates the compliance with Federal VOC standards. Consequently, these regulations override the need to evaluate life-cycle costs associated with reducing VOC emissions to these required limits. It is important, however, to evaluate the life-cycle costs associated with complying with limits that are stricter than those required by Federal law. If DLA determines that the environmental attribute *low VOC content* should be based on California regulations, the life cycle cost estimates should be considered. California EPA conducted an evaluation of the economic impacts of reducing VOC emissions to lower levels than required by Federal regulations. Based on this evaluation, it is clear that that reducing the volume of VOCs released into the atmosphere results in a higher initial cost. California EPA did not conduct a study to determine if higher initial purchase price for environmentally oriented products would be off-set by other reduced costs (e.g., associated with reduced health care costs resulting from less smog). Therefore, it is not clear whether selection of products that have a *low VOC content*, as defined in this document, would result in a life-cycle cost benefit.

Based on the research conducted and presented in this analysis, it is not clear if *low VOC content* meets the evaluation criteria established by JG-EnvAtt as an environmental attribute that should be included in the FLIS system. DLA needs to determine 1) if it is appropriate to use State Regulations as the basis for the definition of an environmental attribute, and 2) if it is appropriate to include an environmental attribute in the FLIS that does not clearly have a life-cycle cost benefit. If DLA decides to include this environmental attribute in FLIS, Litton-PRC and PPC recommend that the JG-EnvAtt Coordinating Committee use California State regulations as the basis for defining *low VOC content*.

## **Appendix A**

### **Products with VOC Contents Limited by the Federal Government**

#### **Household Consumer Products**

Air fresheners-single phase  
Air fresheners-double phase  
Air fresheners-liquids/pump sprays  
Air fresheners-solids/gels  
Automotive windshield washer fluid  
Bathroom and tile cleaners-Aerosols  
Bathroom and tile cleaners- all other forms  
Carburetor and choke cleaners  
Cooking sprays-aerosol  
Dusting aids-aerosols  
Dusting aids-all other forms  
Engine degreasers  
Fabric protectants  
Floor polishes/waxes-products for flexible flooring materials  
Floor polishes/waxes-products for nonresilient flooring  
Floor polishes/waxes-wood floor wax  
Furniture maintenance products-aerosol  
General purpose cleaners  
Glass cleaners-aerosols  
Glass cleaners-all other forms  
Hairsprays  
Hair mousses  
Hair Styling gels  
Household adhesives-aerosols  
Household adhesives-contact  
Household adhesives-construction and panel  
Household adhesives-general purpose  
Household adhesives-structural waterproof  
Insecticides-crawling bug  
Insecticides-flea and tick  
Insecticides-flying bug  
Insecticides-foggers  
Insecticides-lawn and garden  
Laundry prewash-aerosols/solids  
Laundry prewash-all other forms  
Laundry starch products  
Nail polish removers  
Oven cleaners-aerosols/pump sprays

Oven cleaners-liquids  
Shaving creams  
Underarm antiperspirants-aerosol  
Underarm deodorants-aerosol  
Charcoal lighter material

#### **Architectural Coatings**

Antenna coatings  
Anti-fouling coatings  
Anti-graffiti coatings  
Bituminous coatings and mastics  
Bond breakers  
Calcimine recoater  
Chalkboard resurfacers  
Concrete curing compounds  
Concrete curing and sealing compounds  
Concrete protective coatings  
Concrete surface retarders  
Conversion varnish  
Dry fog coatings  
Extreme high durability coatings  
Faux finishing/glazing  
Fire-retardant/resistive coatings-clear  
Fire-retardant/resistive coatings-opaque  
Flat coatings-exterior coatings  
Flat coatings-interior coatings  
Floor coatings  
Flow coatings  
Form release compounds  
Graphic arts coatings (sign paints)  
Heat reactive coatings  
High temperature coatings  
Impacted immersion coatings  
Industrial maintenance coatings  
Lacquers (including lacquer sanding sealers)  
Magnesite cement coatings  
Mastic texture coatings  
Metallix pigmented coatings  
Multi-colored coatings

**Architectural Coatings (Cont.)**

Nonferrous ornamental metal lacquers and surface protectants

Nonflat coatings-exterior coatings

Nonflat coatings-interior coatings

Nuclear coatings

Pretreatment wash primers

Primers and undercoaters

Quick-dry coatings-enamels

Quick-dry coatings-primers, sealers, and undercoaters

Repair and maintenance thermoplastic coatings

Roof coatings

Rust preventative coatings

Sanding sealers (other than lacquer sanding sealers)

Sealers (including interior clear wood sealers)

Shellacs-clear

Shellacs-opaque

Stains-clear and semitransparent

Stains-opaque

Stains-low solids

Stain controllers

Swimming pool coatings

Thermoplastic rubber coatings and mastics

Traffic marking coatings

Varnishes

Water proofing sealers and treatments

Wood preservatives-below ground wood preservatives

Wood preservatives-clear and semi-transparent

Wood preservatives-opaque

Wood preservatives-low solids

Zone marking coatings

Multi-colored topcoats

Specialty coatings

**Automobile Refinish Coatings**

Pretreatment wash primers

Primers/primer surfacers

Primer sealers

Single/two-stage topcoats

Topcoats of more than two stages

## Appendix B - Acronyms

CAA	Clean Air Act
CFR	Code of Federal Regulations
DISC	Defense Industrial Supply Center
DLA	Defense Logistics Agency
DOE	Department of Energy
EO	Executive Order
EPA	Environmental Protection Agency
FAR	Federal Acquisition Requirements
FLIS	Federal Logistics Information System
GSA	General Services Administration
HVOC	High Volatile Organic Compound
JG-EnvAtt	Joint Group on Environmental Attributes
JLC	Joint Logistics Commanders
LCC	Life-Cycle Cost
P2	Pollution Prevention
PPA	Pollution Prevention Act
SCAQMD	South Coast Air Quality Management District
VOC	Volatile Organic Compound

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