

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Staff Report for Amendments to:

Rule 102 - Definition of Terms,

Rule 1106.1 - Pleasure Craft Coating Operations

**Rule 1151 - Motor Vehicle and Mobile Equipment Non-Assembly Line
Coating Operations**

Rule 1171 - Solvent Cleaning Operations

Rule 1302 - Definitions (New Source Review)

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EXECUTIVE SUMMARY

The United States Environmental Protection Agency (EPA) has recently excluded tetrachloroethylene (perchloroethylene), 3,3-dichloro-1,1,1,2,2,-pentafluoropropane (HCFC 225ca), 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC 225cb) and 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC-43-10mee) from the federal definition of volatile organic compounds (VOCs). The exclusion for perchloroethylene was effective March 8, 1996.³ The exclusion for HCFC 225ca, HCFC 225cb and HFC-43-10mee was effective November 7, 1996.⁴ EPA excluded these compounds from the federal VOC definition on the basis that they have negligible photochemical reactivity. EPA's actions revised the VOC definition for purposes of preparing State Implementation Plans (SIPs) to attain and maintain the national ambient air quality standards (NAAQS) for ozone under Title I of the Clean Air Act (Act).

The South Coast Air Quality Management District (AQMD) accepts EPA's findings regarding the photochemical reactivity of these compounds. Therefore, AQMD proposes to list the aforementioned compounds as "exempt compounds" relative to the definition of VOC. This action by AQMD does not limit AQMD's ability to regulate these compounds, as appropriate, under any other rule or regulation. For example, AQMD will continue to regulate perchloroethylene as a carcinogenic air contaminant under Rule 1402 - Control of Toxic Air Contaminants from Existing Sources.

The proposed amendments to Rule 102 - Definition of Terms, adds perchloroethylene, HCFC 225ca, HCFC 225cb, and HFC 43-10mee to the list of exempt compounds. Perchloroethylene is being added as a Group II Exempt Compound with an effective date of December 2, 1997. The other three compounds are being added as Group I Exempt Compounds effective the date of adoption. Furthermore, two additional definitions are being added to Rule 102: "Clean Air Solvent" and "Ozone Depleting Compounds."

These two definitions are being removed from Rules 1171 - Solvent Cleaning Operations, and 1302 - Definition of Terms, respectively and consolidated in Rule 102. The transfer of these definitions is an administrative action and does not change the meaning of these terms.

This proposal affects three other AQMD rules that control VOC emissions, namely Rule 1106.1 - Pleasure Craft Coating Operations, for pleasure craft coating operations, Rule 1151 - Motor Vehicle Mobile Equipment Non-Assembly Line Operations, for auto body shops, and Rule 1171 for solvent cleaning. The proposed amendments to Rule 1106.1 and 1151 are administrative in nature, to allow the use of cyclic branched, or linear, completely methylated siloxanes (VMS), parachlorobenzotrifluoride (PCBTF), and per-

³ 61 Federal Register 4588 / Vol. 61 No. 26/ Wednesday, February 7, 1996 / Rules and Regulations

⁴ 61 Federal Register 52847 / Vol. 61. No. 196 / Tuesday, October 8, 1996 / Rules and Regulations

chloroethylene in Rules 1106.1 and 1151. The amendment to Rule 1171 is to allow the use of perchloroethylene in Rule 1171 operations.

VMS and PCBTF were incorporated as Group II Exempt Compounds as part of the November 1995 amendments to Rule 102. Perchloroethylene is proposed to be listed as a Group II Exempt Compound as part of the proposed amendments.

The Group II Exempt Compound category was initially developed to list ozone depleting compounds (ODCs); however, this category later evolved to include compounds for which a warning on future regulatory action was warranted. Rules 1106.1, 1151, and 1171 restrict the use of Group II Exempt Compounds with the intent to restrict the use of ODCs.

Rule 1171 was amended in September 1996. As part of those amendments, the rule was modified to allow the use of VMS and PCBTF for Rule 1171 operations. The proposed amendments in this package would allow the use of VMS, PCBTF, and perchloroethylene for Rule 1106.1, 1151, and 1171 operations. The proposed amendments are consistent with the September 1996 Board action and are considered to be administrative amendments.

AQMD staff has evaluated the proposed amendments pursuant to the California Environmental Quality Act (CEQA) and will prepare the appropriate environmental document. The document will be circulated for a 30-day public review and comment period. All comments received on the draft CEQA document will be incorporated into the final CEQA document, which will be available to the public and the Board prior to the Public Hearing.

The definitions in Rule 102 supersede all exempt compound definitions in other AQMD regulations including, but not limited to, Regulations III - Fees, IV - Prohibitions, XI - Source Specific Standard, and XIII - New Source Review; however, the proposed changes will have no impact on existing emission limits. In fact, this proposal may facilitate compliance with the emissions limitations of Rules 1106.1, 1151, and Rule 1171 through the use of exempt compounds, thus lowering VOC emissions.

BACKGROUND

Perchloroethylene

EPA conducted a laboratory testing program to investigate the ability of perchloroethylene to form photochemical smog. The study concluded that perchloroethylene was less reactive than equal concentrations of ethane. Ethane is the baseline or standard by which compounds are compared to determine their relative reactivity. The investigative details

are contained in the EPA report "Photochemical Reactivity of Perchloroethylene" EPA-600/3-83-001, January 1983. This study led the Halogenated Solvents Industry Alliance (HSIA) to petition the EPA to include perchloroethylene in its definition of negligible photochemically reactive organic compounds.

EPA requested public input regarding the proposed exemption of perchloroethylene. The supporting EPA documents contained comments from eight entities, with most comments in support of the proposed action (61 FR 4588, No. 26, February 7, 1996). Two commentators suggested delaying or withdrawing the proposal until adequate protection of public health had been established through control of emissions of perchloroethylene from all sources. Perchloroethylene is listed as a Hazardous Air Pollutant (HAP) in Section 112 of the Act and National Emission Standards for Hazardous Air Pollutants (NESHAPs) exist for perchloroethylene sources from dry cleaning (58 FR 49354, September 22, 1993), halogenated solvent cleaning (59 FR 61801, December 2, 1994), aerospace industry (60 FR 4548, September 1, 1995), and as a feedstock in the organic chemical manufacturing industry (59 FR 19402, April 22, 1994). Pursuant to the Act, Section 112(e), EPA will be issuing hazardous pollutant emissions standards for various other categories including several other perchloroethylene sources through November 15, 2000.

HCFC 225ca, HCFC 225cb and HFC 43-10mee

The exclusion of these compounds was done by EPA in response to petitions made by two interested organizations. "In support of their petitions, these organizations supplied information on the photochemical reactivity of their individual compounds. This information consisted mainly of the rate constant for the reaction of the compound with the hydroxyl (OH) radical. This rate constant (K_{OH} value) is commonly used as one measure of the photochemical reactivity of compounds. The petitioners compared the rate constants with that of other compounds which have already been listed as photochemically negligibly reactive (e.g., ethane which is the compound with the highest K_{OH} value that is currently reported as negligibly reactive)."⁵

Based on information provided by the two organizations, EPA made the finding that HCFC 225ca, HCFC 225cb, and HFC 43-10mee are less photochemically reactive than ethane. On that basis, EPA excluded these compounds from the federal VOC definition.

VMS and PCBTF Compounds

VMS and PCBTF compounds were excluded from the federal VOC definition effective December 1994. These compounds were listed, by AQMD, as Group II Exempt Com-

⁵ 61 Federal Register 52847 / Vol. 61, No. 196 / Tuesday, October 8, 1996 / Rules and Regulations

pounds in November 1995. The listing of VMS and PCBTF compounds as Group II Exempt Compounds restricted their use for sources regulated under Rules 1106.1, 1151, and 1171. The restriction of use for sources regulated under Rule 1171 was removed as part of the September 1996 amendments to Rule 1171.

MATERIAL DESCRIPTION

Perchloroethylene

Perchloroethylene (C_2Cl_4) is a colorless, nonflammable liquid at room temperature with an ethereal odor. It is commonly used in dry cleaning, degreasing, and as a maskant. It may also be used in paints and architectural coatings, adhesives, and miscellaneous uses in the manufacture of aerosol spray paints and cleaners, pharmaceuticals, textiles, printing inks, and dielectric fluids for power transformers. Acute and chronic inhalation exposure results in central nervous system effects. Perchloroethylene is also classified as a carcinogen.

HCFC 225ca and HCFC 225cb

HCFC 225ca and 225cb are thermally stable and nonflammable at room temperature. These HCFCs are designed to replace chlorofluorocarbons, perfluorocarbons and other HCFCs which have high ozone depletion potential. These materials are used for general and precision cleaning, drying and defluxing applications. The Acceptable Exposure Limit (AEL) for these products has been set, by the manufacturer, at 50 ppm, 8-hour Timed Weighted Average (TWA).

HFC 43-10mee

HFC 43-10mee ($C_5H_2F_{10}$) is a colorless, nonflammable liquid, thermally stable to 300 °C (572 °F). HFC-43-10mee has a zero Ozone Depleting Potential (ODP) and a Global Warming Potential (GWP) of 0.25. This compound is considered a low-toxicity compound with an AEL of 200 ppm TWA concentration for an 8- and 12-hour workday and a 40-hour workweek. This compound is a slight skin and eye irritant and has a low acute inhalation toxicity. These compounds are typically used as cleaning and rinsing agents, drying fluids, lubricants, solvent, and heat transfer media.

VMS Compounds

VMS is a class of high boiling liquids with a completely methylated $[-Si-O-]_x$ basic structure. There are currently 14 VMS compounds of which six are commercially available. Three are linear which are used for solvent cleaning, and three are cyclic and used mostly in consumer products. There are no branched VMS commercially available.

VMS is flammable and costly at a current price of \$65 a gallon. It is a potential replacement for ODC and VOC materials in paints, consumer products, and cold solvent cleaning. Although current commercial usage is small, some VMS compounds are commonly used in anti-perspirants, skin creme, hair conditioners, glass cleaners, and in paper coatings and lubricants.

"There is little toxicity data available on VMS, however, EPA ... [concluded] in ... the staff report [supporting the de-listing of VMS compounds] that the known toxic effects do not warrant alteration of their decision [to de-list VMS from the definition of exempt compounds]. None of the VMS compounds are listed in Proposition 65, AB 1807, or AB 2588. ..."⁶

PCBTF Compounds

"PCBTF ($C_7H_4F_3Cl$) is a colorless, combustible liquid at room temperature with a sweet, naphthalenic odor The current usage of PCBTF is ... small. It is expected to be used in surface cleaning, ... consumer products, and coatings.

"PCBTF is ... priced at approximately \$21 per gallon, and is moderately toxic. ... Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) has determined that its toxic impacts are not expected to result in specific health effects. ... PCBTF is not listed in Proposition 65, AB 1807, or AB 2588 ..."⁷

EMISSIONS

Perchloroethylene is a solvent most commonly used in dry cleaning, vapor degreasing operations, film cleaning and improved image transfer processes, chemical maskant operations, and consumer product aerosol cleaner manufacturing. The emission inventory, based on 1993 data, is estimated at 11.8 tons per day. Over 68% of the emissions are attributed to dry cleaning operations, while degreasing operations and maskant operations account for 25% and 6% of the emissions, respectively.

There has been some increase in the use of perchloroethylene because of the phase out of production of 1,1,1,-trichloroethane (TCA), which is heavily used in degreasing operations. However, this increase is offset by companies moving into aqueous degreasing systems or getting out of degreasing completely.

Perchloroethylene is the solvent of choice used in dry cleaning facilities. Out of over 2400 dry cleaning establishments in the South Coast Air Basin (Basin), about 98% of the

⁶ Final Staff Report for: Amended Rule 102 - Definition of Terms, S. Jones, F. Keeler, November 17, 1995

⁷ Final Staff Report for: Amended Rule 102 - Definition of Terms, S. Jones, F. Keeler, November 17, 1995

facilities use perchloroethylene. Dry cleaning units are usually controlled by condensation or carbon adsorption.

Perchloroethylene is used in the film industry in two categories. Perchloroethylene is an excellent remover of scale build up and acid by-products that result over time as celluloid decays. Some film cleaning facilities have converted to HCFC-4310, a non-toxic synthetic solvent. It is also used in specialty "wet printing" to improve the quality of film by reducing scratches that have occurred to negatives. The amount of scratch can be reduced because the refractive index of perchloroethylene matches the refractive index of the film.

Some waterborne chemical maskants have been approved for use by some aircraft manufacturing companies. However, large amounts of perchloroethylene are still being used resulting in substantial emissions (0.5-1.0 tons per day). There are four major chemical milling maskant applicators in the Basin. All have installed carbon adsorption control systems.

Additional emissions from perchloroethylene come from the manufacture of consumer products. These products are mostly aerosol cleaners used in automotive repair shops.

Representatives of trade associations for the manufacturer and end-users of perchloroethylene have advised the EPA that it is their belief that perchloroethylene consumption in consumer products and related products (and thus associated emissions) will not increase dramatically as a result of the exemption. Industry associations are committed to survey or otherwise track how consumption of perchloroethylene in these kinds of products change. Any significant increase in perchloroethylene emissions or public exposure from such sources would trigger appropriate regulatory action.

There is no emission inventory data available for HCFC 225ca, HCFC 225cb, and HFC-43-10mee.

SOCIOECONOMIC ANALYSIS

Proposed amendments to Rule 102 removes several compounds from the definition of VOCs in order to be consistent with the EPA's definition. These compounds are perchloroethylene, HCFC 225ca, HCFC 225cb, and HFC-43-10mee. Perchloroethylene will be added to the list of Group II Exempt Compounds and the remaining three to the list of Group I Exempt Compounds. Proposed amendments to Rules 1106.1, 1151, and 1171 allow the use of some Group II Compounds (perchloroethylene, VMS, and PCBTF) which are currently not permitted to be used. Other amendments to those aforementioned rules and Rule 1302 are definitional and administrative in nature.

Prices of HCFC 225ca, HCFC 225cb, HFC-43-10mee, VMS, and PCBTF are far more expensive than those of VOCs. For example, HFC-43-10mee is approximately \$15 per pound, compared to \$0.53 per pound of VOCs commonly found in mineral spirits. Although the price of perchloroethylene is comparable to that of VOCs in mineral spirits, the use of perchloroethylene could trigger Rule 1402. Thus, a switch to these non-VOC compounds is unlikely. Hence, it is not expected that the proposed amendments will result in adverse economic impacts.

On October 14, 1994, the Governing Board adopted a resolution that requires staff to address whether proposed rules being considered for adoption are presented in rank order by cost effectiveness as defined in the AQMP. The proposed amendments are not part of the 1997 AQMP; therefore, consideration in the order of cost-effectiveness is not applicable.

Health and Safety Code Section 40920.6 requires an incremental cost effectiveness analysis for potential control options which would achieve the emission reduction objective in the proposed regulation. Since no control options are ascribed to the proposed amended rules, the incremental cost effectiveness analysis does not apply here.

COMMENTS AND RESPONSES

Comment 1-1: The California Air Resources Board has reviewed the proposed amendments to Rules 102 and 1302. ARB recommends that the AQMD complete an analysis of the environmental impacts of exempting perchloroethylene, HCFC 225ca, HCFC 225cb, and HFC 43-10mee.

Response 1-1: AQMD has evaluated the proposed amendments pursuant to the CEQA and will prepare an Environmental Assessment (EA) for the proposed project. The document will be circulated for a 30-day review and comment period. All comments received on the Draft EA will be incorporated into the Final EA.

Comment 1-2: The EPA issued its final rule exempting the isomers of HCFC 225 from the VOC definition. Hughes Electronics hereby requests that the AQMD incorporate these isomers in the Exempt Compounds definition.

Response 1-2: The proposed amendments lists the HCFC 225c isomers as Group I Exempt Compounds.

Comment 1-3: The Halogenated Solvent Industry Alliance (HSIA) strongly supports the AQMD's proposal to exempt perchloroethylene from the VOC definition. This exemption would allow the AQMD to focus on compounds that are ozone precursors and will alleviate the potential for conflict and duplication with other controls on the use of the solvent. Perchloroethylene is subject to control under federal, state, and other AQMD requirements for dry cleaning, and other federal and AQMD requirements for degreasing and aerospace operations. Concerns about emissions of the solvent from these sources can and should be addressed as part of the AQMD's rules relating to these applications.

Response 1-3: Thank you for your comment, which has been noted.

Comment 1-4: Occidental Chemical Corporation (OxyChem) supported the initial proposal to amend Rule 102. OxyChem urges AQMD to remove the distinction between Group I and Group II Compounds. The proposed amendment would allow the use of PCBTF for applications regulated under Rules 1106.1 and 1151. PCBTF is sold by OxyChem under the trade name OXSOL[®] 100. The proposed amendment to Rule 102 would allow coating formulations to employ OXSOL[®] 100 and thereby contribute to improved air quality.

Response 1-4: The proposed amendments to Rule 102 were modified based on public comments received after the release of the initial proposal. AQMD staff re-evaluated its decision to remove the group categories and the warning that currently exists in the "Exempt Compound" definition. The current proposal maintains the existing structure of the definition. The current structure of the definition was maintained to ensure that the public is aware that Group II Compounds may be subject to future regulations. Furthermore, maintaining the existing structure of this definition is consistent with recommendations received from the public and the AQMD's Health Effects Officer. The proposed amendments, as revised, would allow the use of PCBTF for operations regulated under Rules 1106.1 and 1151.

Comment 1-5: The Institute for Research and Technical Assistance (IRTA) hereby requests that the AQMD delay the exemption of perchloroethylene until the Halogenated Solvents Degreasing

NESHAP regulation is effective for existing facilities. It becomes effective December 2, 1997. Further, IRTA requests that the AQMD maintain the group categories and warning currently existing in the VOC definition.

Response 1-5: The proposed amendments have been modified consistent with commentator's recommendations. Perchloroethylene is proposed to be listed as a Group II Exempt Compound effective December 2, 1997.

Comment 1-6: The Group II category of the Exempt Compounds definition is not in harmony with the federal regulation in 40 CFR 51.100(s) which defines a single category of VOC-exempt compounds based solely on their photochemical reactivity.

Response 1-6: Whereas the AQMD staff recognizes that the Exempt Compounds definition in Rule 102 does not mirror the federal definition, the AQMD staff disagrees with the statement that the Rule 102 definition is not in harmony with federal regulations. The AQMD's Exempt Compound definition was designed to address the AQMD Governing Board's policy on ozone depleting compounds and toxics compounds.

Comment 1-7: The proposed restriction on the use of Group II compounds is a duplication of other regulations which already restrict their use based on toxicity.

Response 1-7: The warning on the use of Group II Compounds is intended to enforce the AQMD Governing Board's policy on ozone depleting compounds. The restriction of use of Group II compounds is not based on toxicity. In fact, the proposed amendments eliminate the restriction on use of VMS and PCBTF compounds in Rules 1106.1 and 1151. Perchloroethylene is proposed to be listed in Group II compounds, but its use is not restricted.

DRAFT FINDINGS UNDER THE CALIFORNIA HEALTH AND SAFETY CODE

Before adopting, amending, or repealing a rule, the California Health and Safety code requires the AQMD to adopt written findings of necessity, authority, clarity, consistency,

non-duplication, and reference, as defined in Health and Safety Code Section 40727. The findings are as follows:

Necessity - The AQMD Governing Board has determined that it is necessary to amend Rule 102 - Definition of Terms, Rule 1106.1 - Pleasure Craft Coating Operations, Rule 1151 - Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations, Rule 1171 - Solvent Cleaning Operations, and Rule 1302 - Definitions (New Source Review), to incorporate the new definition of exempt compounds adopted by EPA and to clarify other definitions.

Authority - The AQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from Health and Safety Code Sections 40000, 40001, 40440, 40441, 40463, 40702, 40725 through 40728.

Clarity - The AQMD Governing Board has determined that the proposed amendments to Rule 102 - Definition of Terms, Rule 1106.1 - Pleasure Craft Coating Operations, Rule 1151 - Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations, Rule 1171 - Solvent Cleaning Operations, and Rule 1302 - Definitions, are written or displayed so that their meaning can be easily understood by persons directly affected by them.

Consistency - The AQMD Governing Board has determined that Proposed Amended Rule 102 - Definition of Terms, Rule 1106.1 - Pleasure Craft Coating Operations, Rule 1151 - Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations, Rule 1171 - Solvent Cleaning Operations, and Rule 1302 - Definitions, are in harmony with, and not in conflict with or contradictory to, existing federal or state statutes, court decisions, or regulations.

Non-Duplication - The AQMD Governing Board has determined that the proposed amendments to Rule 102 - Definition of Terms, Rule 1106.1 - Pleasure Craft Coating Operations, Rule 1151 - Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations, Rule 1171 - Solvent Cleaning Operations, and Rule 1302 - Definitions, do not impose the same requirements as any existing state or federal regulation, and the proposed rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the AQMD.

Reference - In adopting this regulation, the AQMD Governing Board references the following statutes which the AQMD hereby implements, interprets or makes specific: Health and Safety Code Sections 40001 (rules to achieve ambient air quality standards), 40440(a) (rules to carry out the Air Quality Management Plan), 40440(c) (cost-effectiveness), and the Federal Clean Air Act Section 172(c)(1)(RACT).