

# Eastern Kern Air Pollution Control District

## **RULE 410 ORGANIC SOLVENTS**

**FINAL STAFF REPORT**

**September 1, 2022**

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**I. BOARD ADOPTION**

The Eastern Kern Air Pollution Control District (District) Governing Board adopted amendments to Rule 410, Organic Solvents at an open hearing on September 1, 2022. Provisions of District Rule 410.2, Disposal and Evaporation of Solvents are absorbed into Rule 410 as part of this amendment. Therefore, Rule 410.2 was rescinded upon board adoption of amended Rule 410.

The rule adoption hearing was held at the District Board Chambers located at 414 W. Tehachapi Boulevard Suite D Tehachapi, CA 93561, beginning at the hour of 2 PM. A Notice of Public Hearing was duly published 30 days prior to this hearing in adjudicated newspapers: the Mojave Desert News, the Daily Independent, Tehachapi News, and the Bakersfield Californian. The notice requested written comments on the proposed Rule amendments and associated staff report by August 31, 2022. No comments were received.

**II. INTRODUCTION**

Amendments to Rule 410 were initially intended as contingency measures needed to provide additional emission reductions in the event the District failed to meet reasonable further progress (RFP) milestones or failed to attain the 2008, Ozone National Ambient Air Quality Standard (NAAQS) or the 2015 Ozone NAAQS by each respective attainment date. However, modeling showed that the District would not meet RFP requirements pursuant to the 2015, Ozone NAAQS and the volatile organic compound (VOC) reductions accomplished by amending Rule 410 would be needed now.

The purpose of this amendment is to revise the emission limits for solvent usage requirements to obtain as much VOC emission reductions as is expeditiously practicable, technologically feasible, and economically reasonable.

Provisions of amended Rule 410 are applicable to any miscellaneous source operations that utilize organic solvents as defined in in the rule, and are not otherwise subject to VOC limits in any other District Regulation IV Rule, including source specific coating rules under 410.X series or Rule 432 Polyester Resins. Organic solvents containing VOCs include but not limited to, coatings, resin, adhesives, inks, thinners, diluents, mold seal, mold release, compounds, lubricants, cutting oils and quenching oils.

On May 17, 2022, the District held a public rule development workshop at the District Field Office in Tehachapi, CA; at this workshop District staff presented proposed amendments to Rule 410. A 30-day public review and comment period followed the workshop ending June 16, 2022. The District received comments from industry representatives and revised amendments to Rule 410 to meet this requirement and in response to comments received. Response to comments are summarized in appendix G.

## Rule 410 – Staff Report

Appendix A Amended Rule410, Organic Solvents.

Appendix B Amended Rule410, Organic Solvents, Strikeout Underline.

Appendix C Emission Reduction Analysis

Appendix D Cost Effectiveness Analysis.

Appendix E Rule Consistency Analysis.

Appendix F Rescind Rule 410.2.

Appendix G Response to Comments.

### III. BACKGROUND

Rule 410 was last amended in November of 1979. Therefore, the rule had ample opportunity to lower VOC emission limits and establish more stringent controls. This rule applies to any source operation that uses organic solvents, with the exception of operations exempted under Section VIII (generally, the manufacture or transport of organic solvents or any source operation that is subject to, or exempted by another District rule).

Rule 410 sets daily VOC emission limits for miscellaneous solvent usage operations including but not limited to, wipe cleaning, surface preparation, fuel line flushing, and miscellaneous degreasing operations. The rule also incorporates three different emission standards for the discharge of organic solvents.

- Section IV.B, limits the release of heated organic material to less than 15 pounds per day unless a control efficiency of 85 percent is achieved.
- Section IV.C, limits the discharge of photochemically reactive solvent to less than 40 pounds per day unless a control efficiency of at least 85 percent is achieved.
- Section IV.D, limits the release of non-photochemically reactive solvent to less than 3,000 pounds per day unless a control efficiency of 85 percent is achieved.

### IV. RULE DEVELOPMENT

The California Health and Safety Code (CH&SC) Section 40914(b)(2) states that ozone attainment plans should include *All Feasible Control Measures (AFCMs)*. The California Air Resources Board (CARB) interprets “every feasible control measure to mean that, at a minimum, air districts must consider regulations that have been successfully implemented elsewhere. Districts should also consider

going beyond what has already been accomplished by evaluation of new technologies and innovative approaches that may offer potential emission reductions. Further, districts should consider not only technological factors, but also social, environmental, economic (e.g., cost effectiveness), and energy factors which prevail in a district, along with the resources realistically available to a district to adopt, implement, and enforce the measures.”

In the context of rule development, District staff construes AFCM to mean that each rulemaking project seeks to obtain as much emission reduction from the rule’s source category as is expeditiously practicable, technologically feasible and economically reasonable, as determined by the District’s Governing Board. To this end, District staff compared the current emission limits or control technology against what limits or control technology has been promulgated in other air districts, as well as reviewing the federal, state, and local Best Available Control Technology (BACT) clearinghouses for the most recent control technology available for the source category. District staff determined the amendments will be at least as stringent as currently required state and federal requirements.

Best Available Retrofit Control Technology (BARCT) requirement provisions apply to sources which are subject to District permitting requirements, and that emit or may emit one or more air pollutants. California law established an intermediate level of control that is the "best available" for "retrofit" to existing sources, recognizing that the state's air pollution problems may demand more effective pollution control than what is usually considered "reasonably available" (RACT-reasonably available control technology). BARCT characterizes a standard of emissions control for existing, traditional sources. Air districts have adopted many rules to implement BARCT, including particulate control efficiency standards; limitations on exhaust pollutants; and technology-based requirements that dictate the use of a particular control device or something that is equally effective. The purposes of BACT and BARCT differ in that BACT is designed to minimize the growth in future stationary source emissions and BARCT is designed to reduce current stationary source emissions. BACT is utilized in the permitting process on a case-by case basis, while BARCT is considered for application on an industry-wide basis in the rule development process.

Amendments to Rule 410 incorporate two different types of emission control standards: performance standards and work practice standards. Performance Standards refers to an allowable emission limit, meaning a limit on quantity of pollutant emitted over a specified period of time or a percent reduction. The allowable VOC emission limit for solvent used for solvent cleaning is specified. Work Practice Standards refer to the management plans and procedures that would be undertaken to reduce emissions. Requiring that containers be covered except when adding or removing material from the container is one example of a work practice standard. Amended Rule 410 identifies at least one performance and work practice standard to limit VOC emissions.

### **Amendments to Rule 410**

1. Section I (Applicability) was added to match District formatting of other District Rules.
2. Section II (Definitions) added 14 new definitions. The previous Rule only contained two definitions for “organic solvents” and “photochemically reactive solvent” respectively. The definition for “photochemically reactive solvent” has been retained and moved from Section X to Section II. Definition of organic solvent has been revised to echo the definition of solvent used in District Rule 410.3. Definitions for the following 14 terms have been added to amended Rule 410: APCO, CARB, Baked, Dissolver, EPA, Exempt compounds, Grams of VOC per liter, Heat-Cure or Heat Polymerized, Organic Solvent, SCAQMD, Standards Conditions, Thinner or Viscosity Reducer, and VOC.
3. *Section III (Exemptions)*  
The main goal of the Exemptions Section is to remove redundant and expired language and improve clarity of the exempt operations. Rule 410 was originally adopted in 1972, as a primary means to regulate solvent usage for multiple source operations. However, since then, the District has developed many source specific rules designed to control VOC emissions from the use of solvents. Therefore, the following language will be removed from Section III, (Exemptions): “The use of equipment or surface coating material for which other requirements are specified by these Rules and Regulations” and replaced by a list of District source specific VOC Rules which contain independent requirements for solvent usage/cleaning and thus, exempt from requirements of Rule 410. Additionally, the old compliance schedule and rule references will be removed as these rules have been renumbered and their references are no longer relevant. These include: Rules 411, 412, 413, and 414.
4. *Section IV (Requirements)*  
A compliance date (six months from adoption) has been added to the rule. There are currently three different thresholds in the rule: one for heated solvents, photochemically reactive solvents, and non-photochemically reactive solvents. All three of these will be phased out within six months of adoption. All three thresholds are narrowed down to a single threshold of 833 pounds of VOC per calendar month. This is roughly equivalent to 27 pounds per day which is less than the previous limit of 40 pounds per day. This threshold mirrors South Coast Air Quality Management District (SCAQMD’s) and San Joaquin Valley Air Pollution Control District (SJVAPCD) rules for similar sources.

A separate emission limit of 450 lbs per calendar month has been added as a contingency provision if the District fails to attain the 2008 or 2015, 8-hour Ozone NAAQS. This is roughly equivalent to 10 pounds per day. This provision would be effective on and after sixty days following the effective date of EPA final rulemaking that the District has failed to attain the 2008 or 2015, 8-hour Ozone NAAQS by the applicable deadline.

This threshold is based on emission levels required to achieve necessary emission reductions. In lieu of complying with the solvent VOC emission limits, operators may use an APCO-approved VOC emission control system that meets the specified control efficiency. A VOC capture and control efficiency is required of 90% and 95% respectively. This requirement also sets a minimum standard for any new sources that would be subject to this rule.

Subsections have been added listing organic solvent storage and disposal requirements. Rule 410.2, limited disposal of organic solvents to 1.5 gallons per day. Language in Rule 410 entirely prohibits the disposal of organic solvent via intentional evaporation. Additionally, work practice standards have been explicitly added to Rule 410 for proper solvent storage and disposal practices. Rule 410.2 has been rescinded.

5. *Section V (Administrative Requirements)*

Section V (Administrative Requirements), standardized the language and record retention provisions. Record requirements for compliance with the previous rule and amended rule are listed separately. The records retention requirement has been amended to require that records shall be retained on-site and made available to District staff upon request. Language for VOC emission control systems has also been revised to clarify the current requirements.

6. *Section VI (Test Methods)*

The test method for determining the amount of daily VOC has been clarified in Section VI. The two test methods used for the VOC emission control system were moved to a new subsection in order to outline the calculation of overall capture and control efficiency. The test methods mirror those required by SCAQMD and SJVAPCD.

**V. EMISSION REDUCTIONS**

Emission reductions achieved through amended Rule 410 are expected to be generated from the lower monthly VOC facility-wide emissions limit. If contingency measures are triggered the resulting total VOC emissions reduction will be 0.18 tons per day, which is about a 34% reduction to the adjusted 2012 baseline VOC emissions of 0.54 tons per day. Details of the analysis are in Appendix C of this Staff Report.

Total emission reductions include emissions reductions from the lower VOC emission limit for solvents used in miscellaneous operations (not regulated by other District specific coating and solvent rules). The previous Rule had an emission limit for processes that use photo chemically reactive solvents of 40 lbs/day (or approximately 1,200 lbs/mo). Amended Rule 410 will eventually lower this limit to 450 lbs per month.

## **VI. RULE CONSISTENCY ANALYSIS**

Pursuant to Section 40727.2 of the California Health and Safety Code (CH&SC), prior to adopting, amending, or repealing a rule or regulation, the District is required to perform a written analysis that identifies and compares the air pollution control elements of amended Rules with the corresponding elements of existing or proposed District and EPA Rules, regulations, and guidelines that apply to the same source category. District staff found that facilities could comply with amended Rule 410 as well as all other existing or proposed District Rules. District staff found that the amendments and requirements of this Rule would not conflict with federal Rules, regulations, or policies covering similar stationary sources. The Rule consistency analysis is presented in Appendix D of this staff report.

## **VII. COST EFFECTIVENESS ANALYSIS**

The California Health and Safety Code 40920.6(a) requires the District to conduct a cost effectiveness analysis of available emission control options before adopting each BARCT Rule. The purpose of conducting a cost effectiveness analysis is to evaluate the economic reasonableness of the pollution control measure or Rule. The analysis also serves as a guideline in developing the control requirements listed in a Rule. Details of the cost and cost effectiveness analysis are in Appendix E of this report.

## **VIII. SOCIOECONOMIC IMPACTS**

CHSC Section 40728.5 exempts districts with a population of less than 500,000 persons from the requirement to assess the socioeconomic impacts of proposed Rules. Eastern Kern County population is below 500,000 persons. Additionally, this section does not apply to the adoption, amendment, or repeal of any Rule or regulation that results in any less restrictive emissions limits if the action does not interfere with the district's adopted plan to attain ambient air quality standards, or does not result in any significant increase in emissions." The amendments do not significantly affect air quality, in the contrary amendments to Rule 410 are expected to strengthen emission limitations beyond those already enforced; therefore, no socioeconomic analysis is required.

**IX. ENVIRONMENTAL IMPACTS**

Both the California Environmental Quality Act (CEQA) and CARB policy require an evaluation of the potential adverse environmental impacts of proposed amendments to Rule 410. District staff has concluded that the amendments to lower VOC emission limits will not have any significant adverse effects on the environment. The intent of Amended Rule 410 is to protect public health by reducing the public's exposure to potentially harmful VOC emissions which contribute to ground level ozone. Staff recommends filing a Notice of Exemption under the provisions of Public Resource Code 15061(b)(3).

**X. REFERENCES**

1. South Coast Air Quality Management District – Rule 1171 “Solvent Cleaning Operations” adopted August 2, 1991, last amended July 14, 2006.
2. South Coast Air Quality Management District – Final Staff Report of Proposed Amended Rule 1171 – Solvent Cleaning Operations. June 2006.
3. South Coast Air Quality Management District – Staff Report for Proposed Amended Rule 1171 – Solvent Cleaning Operations. November 2003.
4. San Joaquin Valley Air Pollution Control District –Staff Report for Proposed Amendments to the Solvent Cleaning Portions of Eleven District Rules August, 2007

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**APPENDIX A:**  
**AMENDED RULE 410**  
**ORGANIC SOLVENTS**

**RULE 410 Organic Solvents** - Adopted 4/18/72, Amended 12/17/74, 11/27/79, 9/1/22

**I. Applicability**

The provisions of this rule shall apply to any source operation emitting Volatile Organic Compounds (VOC) from the use of organic solvents unless the source operation is exempted under Section III (Exemptions).

**II. Definitions**

- A. APCO: As defined in Rule 102 (Definitions).
- B. Baked: A process whereby the coated object is heated above ambient temperature to a temperature at or above 194°F for the purpose of curing or drying.
- C. CARB: California Air Resources Board.
- D. Disinfectant: A product that is labeled to destroy or irreversibly inactivate infectious or other undesirable bacteria, pathogenic fungi, or viruses on surfaces or inanimate objects and whose label is registered as a “disinfectant” under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA, 7 U.S.C. 136, et seq.). Products that are labeled as both a “sanitizer” and a “disinfectant” are considered disinfectants.
- E. Dissolver: An organic solvent that is added to an adhesive, coating, or ink in order to melt or to liquefy solid particles.
- F. EPA: United States Environmental Protection Agency.
- G. Exempt Compounds: All organic compounds not classified as VOC, as listed in the definition of VOC in Rule 102 (Definitions).
- H. Facility: The same as “Stationary Source” as defined in Rule 210.1
- I. Grams of VOC per liter of Material: The weight of VOC per volume of material and is calculated by the following equation:  
$$\text{Grams of VOC per liter of material} = \frac{W_s - W_w - W_{ec}}{V_m}$$

Where:

  - $W_s$  = Weight of volatile compounds, in grams
  - $W_w$  = Weight of water, in grams
  - $W_{ec}$  = Weight of exempt compounds, in grams
  - $V_m$  = Volume of material, in liters.
- J. Heat-Cured or Heat-Polymerized: heated to a temperature less than or equal to 194°F for the purpose of curing a coating, ink or adhesive.
- K. Organic Solvent: The same as “Solvent.”

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- L. Photochemically Reactive Solvent: Any organic solvent with an aggregate of more than 20% of its total volume composed of chemical compounds classified below or which exceeds any of the following individual percentage composition limitations referring to the total volume of solvent:
1. A combination of hydrocarbons, alcohols, aldehydes, esters, ethers or ketones having an olefinic or cycloolefinic type of unsaturation: five (5) percent; or
  2. A combination of aromatic compounds with eight (8) or more carbon atoms to the molecule except ethylbenzene: eight (8) percent; or
  3. A combination of ethylbenzene, ketones having branched hydrocarbon structures, or toluene: 20%.

Whenever any organic solvent or any constituent of an organic solvent may be classified from its chemical structure into more than one (1) of the above groups of organic compounds, it shall be considered as a member of the most reactive chemical group, that is, that group having the least allowable percentage of the total volume of solvents.

M. SCAQMD: South Coast Air Quality Management District.

N. Solvent: Any liquid containing an organic compound or combination of organic compounds used as diluent, thinner, dissolver, viscosity reducer, cleaning agent, or other similar uses. These liquids are principally derived from petroleum and include petroleum distillates, chlorinated hydrocarbons, chlorofluorocarbons, ketones, and alcohols. Solutions, emulsions, and dispersions of water and soap, or water and detergent, are not considered organic solvents. Soaps and detergents are considered water based surfactants. Disinfectants are not considered solvents while applied for the purpose of destroying bacteria, viruses, or fungi.

O. Standard Conditions: As defined in Rule 102 (Definitions).

P. Thinner or Viscosity Reducer: An organic solvent which is used to dilute coatings to reduce viscosity, color strength, and solids, or to modify drying conditions.

Q. Volatile Organic Compound (VOC): The definitions contained in 40 CFR 51.100 shall apply, and are hereby incorporated by reference. In the event of any discrepancy between a definition contained in 40 CFR 51.100 and any definition in this rule, the definition in 40 CFR 51.100 (s) above shall be utilized.

### III. Exemptions

The provisions of this Rule shall not apply to:

- A. The manufacture of organic solvents, or the transport or storage of organic solvents or materials containing organic solvents.
- B. Provisions of this rule do not apply to coatings, coating removers (strippers), surface preparation material, and cleanup material specifically subject to the requirements of the following District rules:

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1. 410.1A, Architectural Coating Controls;
  2. 410.3, Organic Solvent Degreasing Operation;
  3. 410.4, Metal, Plastic, and Pleasure Craft Parts and Products Coating Operations,
  4. 410.4A, Motor Vehicle and Mobile Equipment Refinishing Operations,
  5. 410.7, Graphic Arts;
  6. 410.8, Aerospace Assembly and Coating Operations;
  7. 410.9, Wood Products Surface Coating Operations;
  8. 432, Polyester Resin.
- C. The spraying or other employment of insecticides, pesticides or herbicides.
- D. The employment, application, evaporation or drying of saturated halogenated hydrocarbons or perchloroethylene.
- E. The use of any material, in any article, machine, equipment or other contrivance described in Sections IV.B, IV.C, and IV.D if:
1. the volatile content of the material consists only of water and organic solvents, and
  2. the organic solvents content comprises not more than 20% by volume of the total volatile content, and
  3. the volatile content is not photochemically reactive, and the organic solvent does not come into contact with flame.
- F. Provisions of this rule do not apply to organic compounds while applied to surfaces for the specific purpose of disinfection. Disinfectants purchased and applied in consumer applications subject to the requirement of California Air Resources Board (CARB) Consumer Products Rules, 17 CCR 94500 – 94555 are exempt from this rule. Disinfectants purchased in bulk or not subject to CARB Consumer Products Rules are also not subject to the requirements of this rule.”

### IV. Requirements

- A. Sections IV.B through IV.E shall remain in effect until March 8, 2024.
- B. Solvents Subjected to Heat: A person shall not discharge into the atmosphere more than 15 pounds or organic materials in any 1 day from any article, machine, equipment, or other contrivance in which any organic solvent or any material containing organic solvent comes into contact with flame or is baked, heat-cured, or heat-polymerized in the presence of oxygen, unless said discharge has been reduced by at least 85 percent. These portions of any series of articles, machines, equipment, or other contrivances designed for processing continuous web, strip, or wire that emit organic materials in the course of using operations described in this Section shall be collectively subject to compliance with this Section.

- C. Photochemically Reactive Solvents: A person shall not discharge into the atmosphere more than 40 pounds of organic materials in any 1 day from any article, machine, equipment or other contrivance used under conditions other than those described in IV.B for employing or applying any photochemically reactive solvent, or any material containing such photochemically reactive solvent, unless said discharge has been reduced by at least 85 percent. Emissions of organic materials into the atmosphere resulting from air or heated-drying of products for the first 12 hours after their removal from any article, machine, or other contrivance described in this Section shall be included in determining compliance with this paragraph. Emissions resulting from baking, heat-curing, or heat-polymerizing as described in IV.B of this rule shall be excluded from determination of compliance with this Section. Those portions of any series of articles, machines, equipment, or other contrivances designed for processing a continuous web, strip, or wire that emit organic materials in the course of using operations described in this Section shall be collectively subject to compliance with this Section.
- D. Non-photochemically Reactive Solvents: A person shall not, discharge into the atmosphere more than 3,000 pounds of organic materials in any 1 day from any article, machine, equipment, or other contrivance in which any non-photochemically reactive organic solvent or any material containing such a solvent is employed or applied, unless said discharge has been reduced by at least 85 percent. Emissions or organic materials into the atmosphere resulting from air or heated-drying of products for the first 12 hours after their removal from any article, machine, equipment, or other contrivance described in this Section shall be included in determining compliance with this Section. Emissions resulting from baking, heat-curing, or heatpolymerizing as described in IV.B of this rule, shall be excluded from determination of compliance with this Section. Those portions of any series of articles, machines, equipment, or other contrivances designed for processing a continuous web, strip, or wire that emit organic materials in the course of using operations described in this Section shall be collectively subject to compliance with this Section.
- E. Cleanup: Emissions of organic materials to the atmosphere from the cleanup with photochemically reactive solvent, from any article, machine, equipment or other contrivance described in IV.B, IV.C, and IV.D ., shall be included with the other emissions of organic materials from that article, machine, equipment or other contrivance for determining compliance with this Rule.
- F. On and after March 8, 2024, from all VOC-containing materials, equipment, and processes subject to this rule, an operator shall not emit to the atmosphere VOCs in excess of 450 pounds VOC per calendar month per facility.
1. Compliance with provisions above may be obtained through use of any of the following or any combination thereof:
    - a. Product reformulation or substitution;
    - b. Process changes;
    - c. Improvement of operation efficiency;
    - d. Development of innovative technology;

G. In lieu of meeting the VOC emission limit in Section IV.F, an operator may install and operate a VOC emission control system that meets the following requirements.

1. The VOC emission control system shall be approved by the APCO.
2. The VOC emission control system shall have a capture efficiency of at least 90 percent by weight (90 wt%) and a control efficiency of at least 95 wt%.

H. Organic Solvent Storage, and Disposal Requirements

An operator shall store or dispose of fresh or spent solvents, including waste solvent cleaning materials such as cloth, paper, etc., coatings, adhesives, catalysts, and thinners in closed, non-absorbent and non-leaking containers. The containers shall remain closed at all times except when filling or emptying, and disposed of in a manner to prevent evaporation of VOCs into the atmosphere at the facility.

V. **Administrative Requirements**

A. Recordkeeping

1. Until March 8, 2024 the records shall identify the organic solvent used in all source operations and shall include the name of each organic solvent, any person using organic solvents or any materials containing organic solvents shall supply the Air Pollution Control Officer, upon request and in the manner and form prescribed by him, written evidence of the chemical composition, physical properties and amount consumed for each organic solvent used.
2. On and after March 8, 2024, operators shall
  - a. Materials List: An operator shall maintain and have available on site, a current list of materials in use which provides all of the data necessary to evaluate compliance including the following information as applicable:
    - i Specific manufacturer's name of solvent-containing material, including solvents, catalysts, and thinners.
    - ii VOC content of each solvent-containing material, as used, in g/l or lb/gal.
  - b. Material Usage Records – An operator shall maintain usage records on a daily basis that include the following information:
    - i Specific material.
    - ii Volume of material used (gallons).
    - iii Specific solvents, catalysts and thinners added to material.
    - iv Volume of each solvent, catalyst and thinner (gallons) added.

- v When the material is a mixture of different materials that are blended by the operator, the mix ratio of the batch shall be recorded and the VOC content of the batch shall be calculated and recorded in order to determine compliance with the VOC emission limits.

3. VOC Emission Control System Records

An operator using a VOC emission control system as a means of complying with this rule shall maintain daily records of key system operating parameters which will demonstrate continuous operation and compliance of the VOC emission control system during periods of emission-producing activities.

4. Records Retention

Records required by this Rule shall be retained for a minimum of three years and made available to the APCO upon request.

B. Emission Control Plan

An owner/operator of an existing facility subject to this Rule and not meeting VOC emission limits listed in section IV.F, shall submit to the Control Officer an Emission Control Plan, including:

1. List of each organic solvent usage operation subject to the Rule, VOC emission limit for each operation, annual VOC emissions from each operation from the preceding three calendar years, and whether the operation is served by a VOC control device.
2. Description of actions to be taken to meet the requirements of Subsection IV.F. Such plan shall include any type of emissions control equipment to be applied to each operation and construction schedule.

**VI. Test Methods**

A. Determination of VOC Content

1. The VOC content of organic solvents shall be determined by using EPA Test Method 24 or 24A or by using the manufacturer's product formulation data and the formula in Section II.H.
2. Exempt halogenated VOCs shall be determined by using the CARB Test Method 432 or SCAQMD Test Method 303.

B. Determination of Overall Capture and Control Efficiency of VOC Emission Control Devices

1. The capture efficiency of a VOC emission control system's collection device(s) shall be determined according to EPA's "Guidelines for Determining Capture Efficiency," January 9, 1995 and 40 CFR 51, Appendix M, Test Methods 204-204F, as applicable, or any other method approved by EPA, ARB, and the APCO.

- The control efficiency of the VOC emission control system’s control device shall be determined by using EPA Methods 2, 2A, or 2D for measuring flow rates and EPA Method 25, 25A, or 25B for measuring total gaseous organic concentrations at the inlet and outlet of the control device. EPA Method 18 or CARB Method 422 shall be used to determine the emissions of exempt compounds. Other ARB, EPA, and ASTM methods verifying VOC emission control may be authorized by the APCO as applicable. The control efficiency of the VOC emission control system’s control device shall be calculated by using the following equation:

$$CE_{CONTROL} = [1 - (VOC_{OUT} / VOC_{IN})] \times 100\%$$

Where:

- $CE_{CONTROL}$  = Control Efficiency, in percent
- $VOC_{IN}$  = VOC content, in grams/liter, less exempt compounds and water, into the control device
- $VOC_{OUT}$  = VOC content, in grams/liter, less exempt compounds and water, out of the control device.

- For VOC emission control systems that consist of a single VOC emission collection device connected to a single VOC emission control device, the overall capture and control efficiency shall be calculated by using the following equation:

$$CE_{CAPTURE \& CONTROL} = [CE_{CAPTURE} \times CE_{CONTROL}] / 100 \%$$

Where:

- $CE_{CAPTURE \& CONTROL}$  = Overall Capture and Control Efficiency, in percent
- $CE_{CAPTURE}$  = Capture Efficiency of the collection device, in percent, as determined in Section VI.B.1.
- $CE_{CONTROL}$  = Control Efficiency of the control device, in percent, as determined in Section IV.B.2.

### C. Determination of VOC Emissions

- The emissions of VOCs, measured and calculated as carbon, shall be determined by using EPA Test Method 25, 25A, or 25B, as applicable. EPA Test Method 18 or CARB Method 422 shall be used to determine the emissions of exempt compounds.
- Total VOC emissions per day shall be determined for each source operation by using the following equation:

$$E_{Total} = \left[ \left( \sum_{i=1}^k L_i V_i \right) + \left( \sum_{m=1}^n L_m V_m \times (1 - CE / 100\%) \right) \right] / 454$$

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Where:

$E_{Total}$	=	Total VOC emissions, in pounds per day
$L_i$	=	Liters per day used of the “i”th organic solvent that is uncontrolled
$V_i$	=	Grams of VOC per liter of material of the “i”th organic solvent that is uncontrolled
$L_m$	=	Liters per day used of the “m”th organic solvent that is controlled
$V_m$	=	Grams of VOC per liter of material of the “m”th organic solvent that is controlled
$CE$	=	Overall capture and control efficiency of the control device, in percent, as determined in Section VI.B.3.

### D. Multiple Methods of Determination

VOC emissions and overall capture and control efficiency determined to exceed any limits established by this rule through the use of any of the above-referenced test methods and equations shall constitute a violation of the rule.

## VII. Compliance Schedule

- A. An owner/operator of an existing facility subject to this Rule and not meeting VOC emission limits listed in section IV.F shall comply with the following schedule:
1. By March 31, 2023, submit to the Control Officer an Emission Control Plan pursuant to section V.B, and complete application for an Authority to Construct, if necessary to modify potential to emit.
  2. By September 8, 2025, demonstrate full compliance with Section IV.F of this Rule

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**APPENDIX B:**  
**AMENDED RULE 410**  
**ORGANIC SOLVENTS**  
**STRIKEOUT UNDERLINE**

**RULE 410** **Organic Solvents** - Adopted 4/18/72, Amended 12/17/74, 11/27/79, 9/1/22

**I. Applicability**

The provisions of this rule shall apply to any source operation emitting Volatile Organic Compounds (VOC) from the use of organic solvents unless the source operation is exempted under Section III (Exemptions).

**II. Definitions**

- A. APCO: as defined in Rule 102 (Definitions).
- B. Baked: a process whereby the coated object is heated above ambient temperature to a temperature at or above 194°F for the purpose of curing or drying.
- C. CARB: California Air Resources Board.
- D. Disinfectant: a product that is labeled to destroy or irreversibly inactivate infectious or other undesirable bacteria, pathogenic fungi, or viruses on surfaces or inanimate objects and whose label is registered as a “disinfectant” under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA, 7 U.S.C. 136, et seq.). Products that are labeled as both a “sanitizer” and a “disinfectant” are considered disinfectants.
- E. Dissolver: an organic solvent that is added to an adhesive, coating, or ink in order to melt or to liquefy solid particles.
- F. EPA: United States Environmental Protection Agency.
- G. Exempt Compounds: all organic compounds not classified as VOC, as listed in the definition of VOC in Rule 102 (Definitions).
- H. Facility: the same as ‘Stationary Source’ as defined in Rule 210.1
- I. Grams of VOC per liter of Material: the weight of VOC per volume of material and is calculated by the following equation:
- $$\frac{\text{Grams of VOC per liter of material}}{V_m} = W_s - W_w - W_{ec}$$
- Where:
- W<sub>s</sub> = Weight of volatile compounds, in grams
- W<sub>w</sub> = Weight of water, in grams
- W<sub>ec</sub> = Weight of exempt compounds, in grams
- V<sub>m</sub> = Volume of material, in liters.
- J. Heat-Cured or Heat-Polymerized: heated to a temperature less than or equal to 194°F for the purpose of curing a coating, ink or adhesive.
- K. Organic Solvent: the same as “Solvent.”
- L. Photochemically Reactive Solvent: any organic solvent with an aggregate of more than 20% of its total volume composed of chemical compounds classified below or

which exceeds any of the following individual percentage composition limitations referring to the total volume of solvent:

1. A combination of hydrocarbons, alcohols, aldehydes, esters, ethers or ketones having an olefinic or cycloolefinic type of unsaturation: five (5) percent; or
2. A combination of aromatic compounds with eight (8) or more carbon atoms to the molecule except ethylbenzene: eight (8) percent; or
3. A combination of ethylbenzene, ketones having branched hydrocarbon structures, or toluene: 20%.

Whenever any organic solvent or any constituent of an organic solvent may be classified from its chemical structure into more than one (1) of the above groups of organic compounds, it shall be considered as a member of the most reactive chemical group, that is, that group having the least allowable percentage of the total volume of solvents.

M. SCAQMD: South Coast Air Quality Management District.

N. Solvent: any liquid containing an organic compound or combination of organic compounds used as diluent, thinner, dissolver, viscosity reducer, cleaning agent, or other similar uses. These liquids are principally derived from petroleum and include petroleum distillates, chlorinated hydrocarbons, chlorofluorocarbons, ketones, and alcohols. Solutions, emulsions, and dispersions of water and soap, or water and detergent, are not considered organic solvents. Soaps and detergents are considered water based surfactants. Disinfectants are not considered solvents while applied for the purpose of destroying bacteria, viruses, or fungi.

O. Standard Conditions: as defined in Rule 102 (Definitions).

P. Thinner or Viscosity Reducer: an organic solvent which is used to dilute coatings to reduce viscosity, color strength, and solids, or to modify drying conditions.

Q. Volatile Organic Compound (VOC): The definitions contained in 40 CFR 51.100 shall apply, and are hereby incorporated by reference. In the event of any discrepancy between a definition contained in 40 CFR 51.100 and any definition in this rule, the definition in 40 CFR 51.100 (s) above shall be utilized.

### III. Exemptions

The provisions of this Rule shall not apply to:

A. The manufacture of organic solvents, or the transport or storage of organic solvents or materials containing organic solvents.

⊖

~~A. The use of equipment for which other requirements are specified by Rules 411, 412, 413, and 414, or which are exempt from air pollution control requirements by said Rules.~~

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B. Provisions of this rule do not apply to coatings, coating removers (strippers), surface preparation material, and cleanup material specifically subject to the requirements of the following District rules:

1. 410.1A, Architectural Coating Controls;
2. 410.3, Organic Solvent Degreasing Operation;
3. 410.4, Metal, Plastic, and Pleasure Craft Parts and Products Coating Operations,
4. 410.4A, Motor Vehicle and Mobile Equipment Refinishing Operations,
5. 410.7, Graphic Arts;
6. 410.8, Aerospace Assembly and Coating Operations;
7. 410.9, Wood Products Surface Coating Operations;
8. 432, Polyester Resin.

~~1.C.~~ The spraying or other employment of insecticides, pesticides or herbicides.

~~2.D.~~ The employment, application, evaporation or drying of saturated halogenated hydrocarbons or perchloroethylene.

E. The use of any material, in any article, machine, equipment or other contrivance described in Sections IV.B, IV.C, and IV.D if:

1. the volatile content of the material consists only of water and organic solvents, and
2. the organic solvents content comprises not more than 20% by volume of the total volatile content, and
3. the volatile content is not photochemically reactive, and the organic solvent does not come into contact with flame.

F. Provisions of this rule do not apply to organic compounds while applied to surfaces for the specific purpose of disinfection. Disinfectants purchased and applied in consumer applications subject to the requirement of California Air Resources Board (CARB) Consumer Products Rules, 17 CCR 94500 – 94555 are exempt from this rule. Disinfectants purchased in bulk or not subject to CARB Consumer Products Rules are also not subject to the requirements of this rule.”

~~3. The use of any material, in any article, machine, equipment or other contrivance described in Sections I., II., III., or IV., if:~~

~~▪ the volatile content of the material consists only of water and organic solvents, and~~

~~▪ the organic solvents content comprises not more than 20% by volume of the total volatile content, and~~

~~▪ the volatile content is not photochemically reactive, and~~

## Rule 410 – Strikeout

- ~~▪ the organic solvent does not come into contact with flame.~~
- 4. ~~The use of any material in any article, machine, equipment or other contrivance described in Sections I., II., III., or IV. if:~~
  - ~~▪ until January 1, 1977, the organic solvent content of a material does not exceed 30% by volume of said material after January 1, 1977, the organic solvent content of such material shall not exceed 20% by volume, and~~
  - ~~▪ the volatile content is not photochemically reactive, and~~
  - ~~▪ the organic solvent content does not come into contact with flame.~~
- 5. ~~The use of equipment or surface coating material for which other requirements are specified by these Rules and Regulations.~~

### IV. Requirements

A. Sections IV.B through IV.E shall remain in effect until March 8, 2024.

B. Solvents Subjected to Heat: A person shall not discharge into the atmosphere more than 15 pounds or organic materials in any 1 day from any article, machine, equipment, or other contrivance in which any organic solvent or any material containing organic solvent comes into contact with flame or is baked, heat-cured, or heat-polymerized in the presence of oxygen, unless said discharge has been reduced by a least 85 percent. These portions of any series of articles, machines, equipment, or other contrivances designed for processing continuous web, strip, or wire that emit organic materials in the course of using operations described in this Section shall be collectively subject to compliance with this Section.

C. Photochemically Reactive Solvents: A person shall not discharge into the atmosphere more than 40 pounds of organic materials in any 1 day from any article, machine, equipment or other contrivance used under conditions other than those described in Paragraph IV.B. of this Section for employing or applying any photochemically reactive solvent, ~~as defined in Paragraph X. of this Section,~~ or any material containing such photochemically reactive solvent, unless said discharge has been reduced by at least 85 percent. Emissions of organic materials into the atmosphere resulting from air or heated-drying of products for the first 12 hours after their removal from any article, machine, or other contrivance described in this Section shall be included in determining compliance with this paragraph. Emissions resulting from baking, heat-curing, or heat-polymerizing as described in IV.B Paragraph I. of this Section rule shall be excluded from determination of compliance with this Section. Those portions of any series of articles, machines, equipment, or other contrivances designed for processing a continuous web, strip, or wire that emit organic materials in the course of using operations described in this Section shall be collectively subject to compliance with this Section.

D. Non-photochemically Reactive Solvents: A person shall not, ~~after August 31, 1986,~~ discharge into the atmosphere more than 3,000 pounds of organic materials in any 1

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day from any article, machine, equipment, or other contrivance in which any non-photochemically reactive organic solvent or any material containing such a solvent is employed or applied, unless said discharge has been reduced by at least 85 percent. Emissions or organic materials into the atmosphere resulting from air or heated-drying of products for the first 12 hours after their removal from any article, machine, equipment, or other contrivance described in this Section shall be included in determining compliance with this Section. Emissions resulting from baking, heat-curing, or heatpolymerizing as described in ~~IV.B~~ Paragraph I. of this Section rule, shall be excluded from determination of compliance with this Section. Those portions of any series of articles, machines, equipment, or other contrivances designed for processing a continuous web, strip, or wire that emit organic materials in the course of using operations described in this Section shall be collectively subject to compliance with this Section.

~~E. Cleanup:~~ Emissions of organic materials to the atmosphere from the cleanup with photochemically reactive solvent, ~~from as defined in Section X., of any article, machine, equipment or other contrivance described in IV.B, IV.C, and IV.D Sections I., II., or III.,~~ shall be included with the other emissions of organic materials from that article, machine, equipment or other contrivance for determining compliance with this Rule.

~~F. On and after March 8, 2024, from all VOC-containing materials, equipment, and processes subject to this rule, an operator shall not emit to the atmosphere VOCs in excess of 450 pounds VOC per calendar month per facility.~~

~~1. Compliance with provisions above may be obtained through use of any of the following or any combination thereof:~~

- ~~a. Product reformulation or substitution;~~
- ~~b. Process changes;~~
- ~~c. Improvement of operation efficiency;~~
- ~~d. Development of innovative technology;~~

~~G. In lieu of meeting the VOC emission limit in Section IV.F, an operator may install and operate a VOC emission control system that meets the following requirements.~~

- ~~1. The VOC emission control system shall be approved by the APCO.~~
- ~~2. The VOC emission control system shall have a capture efficiency of at least 90 percent by weight (90 wt%) and a control efficiency of at least 95 wt%.~~

~~H. Organic Solvent Storage, and Disposal Requirements~~

~~An operator shall store or dispose of fresh or spent solvents, including waste solvent cleaning materials such as cloth, paper, etc., coatings, adhesives, catalysts, and thinners in closed, non-absorbent and non-leaking containers. The containers~~

shall remain closed at all times except when filling or emptying, and disposed of in a manner to prevent evaporation of VOCs into the atmosphere at the facility.

**V. Administrative Requirements**

**A. Recordkeeping**

1. Until March 8, 2024 the records shall identify the organic solvent used in all source operations and shall include the name of each organic solvent, any person using organic solvents or any materials containing organic solvents shall supply the Air Pollution Control Officer, upon request and in the manner and form prescribed by him, written evidence of the chemical composition, physical properties and amount consumed for each organic solvent used.

2. On and after March 8, 2024, operators shall

a. Materials List: An operator shall maintain and have available on site, a current list of materials in use which provides all of the data necessary to evaluate compliance including the following information as applicable:

i Specific manufacturer’s name of solvent-containing material, including solvents, catalysts, and thinners.

ii VOC content of each solvent-containing material, as used, in g/l or lb/gal.

b. Material Usage Records – An operator shall maintain usage records on a daily basis that include the following information:

i Specific material.

ii Volume of material used (gallons).

iii Specific solvents, catalysts and thinners added to material.

iv Volume of each solvent, catalyst and thinner (gallons) added.

v When the material is a mixture of different materials that are blended by the operator, the mix ratio of the batch shall be recorded and the VOC content of the batch shall be calculated and recorded in order to determine compliance with the VOC emission limits.

3. VOC Emission Control System Records

An operator using a VOC emission control system as a means of complying with this rule shall maintain daily records of key system operating parameters which will demonstrate continuous operation and compliance of the VOC emission control system during periods of emission-producing activities.

4. Records Retention

Records required by this Rule shall be retained for a minimum of three years and made available to the APCO upon request.

B. Emission Control Plan

An owner/operator of an existing facility subject to this Rule and not meeting VOC emission limits listed in section IV.F, shall submit to the Control Officer an Emission Control Plan, including:

1. List of each organic solvent usage operation subject to the Rule, VOC emission limit for each operation, annual VOC emissions from each operation from the preceding three calendar years, and whether the operation is served by a VOC control device
2. Description of actions to be taken to meet the requirements of Subsection IV.F. Such plan shall include any type of emissions control equipment to be applied to each operation and construction schedule.

VI. Test Methods

- ~~• Any person using organic solvents or any materials containing organic solvents shall supply the Air Pollution Control Officer, upon request and in the manner and form prescribed by him, written evidence of the chemical composition, physical properties and amount consumed for each organic solvent used.~~

A. Determination of VOC Content

1. The VOC content of organic solvents shall be determined by using EPA Test Method 24 or 24A or by using the manufacturer’s product formulation data and the formula in Section II.H.
2. Exempt halogenated VOCs shall be determined by using the CARB Test Method 432 or SCAQMD Test Method 303.

B. Determination of Overall Capture and Control Efficiency of VOC Emission Control Devices

1. The capture efficiency of a VOC emission control system’s collection device(s) shall be determined according to EPA’s “Guidelines for Determining Capture Efficiency,” January 9, 1995 and 40 CFR 51, Appendix M, Test Methods 204-204F, as applicable, or any other method approved by EPA, ARB, and the APCO.
2. The control efficiency of the VOC emission control system’s control device shall be determined by using EPA Methods 2, 2A, or 2D for measuring flow rates and EPA Method 25, 25A, or 25B for measuring total gaseous organic concentrations at the inlet and outlet of the control device. EPA Method 18 or CARB Method 422 shall be used to determine the emissions of exempt compounds. Other ARB, EPA, and ASTM methods verifying VOC emission control may be authorized by the APCO as applicable. The control efficiency of the VOC emission control system’s control device shall be calculated by using the following equation:

$$CE_{CONTROL} = [1 - (VOC_{OUT} / VOC_{IN})] \times 100\%$$

Where:

$CE_{CONTROL}$  = Control Efficiency, in percent

$VOC_{IN}$  = VOC content, in grams/liter, less exempt compounds and water, into the control device

$VOC_{OUT}$  = VOC content, in grams/liter, less exempt compounds and water, out of the control device.

- For VOC emission control systems that consist of a single VOC emission collection device connected to a single VOC emission control device, the overall capture and control efficiency shall be calculated by using the following equation:

$$CE_{CAPTURE \& CONTROL} = [CE_{CAPTURE} \times CE_{CONTROL}] / 100 \%$$

Where:

$CE_{CAPTURE \& CONTROL}$  = Overall Capture and Control Efficiency, in percent

$CE_{CAPTURE}$  = Capture Efficiency of the collection device, in percent, as determined in Section VI.B.1.

$CE_{CONTROL}$  = Control Efficiency of the control device, in percent, as determined in Section IV.B.2.

### C. Determination of VOC Emissions

- The emissions of VOCs, measured and calculated as carbon, shall be determined by using EPA Test Method 25, 25A, or 25B, as applicable. EPA Test Method 18 or CARB Method 422 shall be used to determine the emissions of exempt compounds.
- Total VOC emissions per day shall be determined for each source operation by using the following equation:

$$E_{Total} = \left[ \left( \sum_{i=1}^k L_i V_i \right) + \left( \sum_{m=1}^n L_m V_m \times (1 - CE / 100\%) \right) \right] / 454$$

Where:

$E_{Total}$	≡	Total VOC emissions, in pounds per day
$L_i$	≡	Liters per day used of the “i”th organic solvent that is uncontrolled
$V_i$	≡	Grams of VOC per liter of material of the “i”th organic solvent that is uncontrolled
$L_m$	≡	Liters per day used of the “m”th organic solvent that is controlled
$V_m$	≡	Grams of VOC per liter of material of the “m”th organic solvent that is controlled
$CE$	≡	Overall capture and control efficiency of the control device, in percent, as determined in Section VI.B.3.

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### D. Multiple Methods of Determination

VOC emissions and overall capture and control efficiency determined to exceed any limits established by this rule through the use of any of the above-referenced test methods and equations shall constitute a violation of the rule.

### VII. Compliance Schedule

A. An owner/operator of an existing facility subject to this Rule and not meeting VOC emission limits listed in section IV.F shall comply with the following schedule:

1. By March 31, 2023, submit to the Control Officer an Emission Control Plan pursuant to section V.B, and complete application for an Authority to Construct, if necessary to modify potential to emit.

2. By September 8, 2025, demonstrate full compliance with Section IV.F of this Rule

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~~• Emissions of organic materials into the atmosphere required to be controlled by Sections I., II., or III., shall be reduced by:~~

~~○ Incineration, provided that 90 percent or more of the carbon in the organic material being incinerated is oxidized to carbon dioxide, or~~

~~○ Absorption, or~~

~~○ Processing in a manner determined by the Air Pollution Control Officer to be not less effective than A. or B. above~~

~~• A person incinerating, absorbing, or otherwise processing organic materials pursuant to this~~

~~Rule shall provide, properly install and maintain in calibration, in good working order and in operation, devices as specified in the Authority to Construct or the Permit to Operate, or as specified by the Air Pollution Control Officer, for indicating temperatures, pressures, rates of flow or other operating conditions necessary to determine the degree and effectiveness of air pollution control.~~

~~• For the purpose of this Rule, organic solvents include diluents and thinners and are defined as organic materials which are liquids at standard conditions and which are used as solvents, viscosity reducers or cleaning agents, except that such materials exhibiting a boiling point higher than 220/F at 0.5 millimeter mercury absolute pressure or having an equivalent vapor pressure shall not be considered to be solvents unless exposed to temperatures exceeding 220/F.~~

~~• For the purposes of this Rule, a photochemically reactive solvent is any solvent with an aggregate of more than 20 percent of its total volume composed of chemical compounds~~

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~~classified below or which exceeds any of the following individual percentage composition limitations, referred to the total volume of solvent:~~

- ~~○ — A combination of hydrocarbons, alcohols, aldehydes, esters, ethers or ketones having an olefinic or cycloolefinic type of unsaturation: 5 percent;~~
- ~~○ — A combination of aromatic compounds with eight or more carbon atoms to the molecule except ethylbenzene: 8 percent;~~
- ~~○ — A combination of ethylbenzene, ketones having branched hydrocarbon structures, trichloroethylene or toluene: 20 percent.~~

~~Whenever any organic solvent or any constituent of an organic solvent may be classified from its chemical structure into more than one of the above groups of organic compounds, it shall be considered as a member of the most reactive chemical group; that is, that group having the least allowable percentage of the total volume of solvents.~~

- ~~● — For the purpose of this Rule, organic materials are defined as chemical compounds of carbon excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides, metallic carbonates and ammonium carbonate.~~

**APPENDIX C**  
**AMENDED RULE 410**  
**ORGANIC SOLVENTS**  
**EMISSION REDUCTION ANALYSIS**

**I. Introduction**

This appendix identifies the estimated volatile organic compounds (VOC) emission reductions for draft amendments to Rule 410 (Organic Solvents). These estimates are based on the best available information at the time that this report was written.

A. The District’s 2012 inventory is used for baseline planning and for Reasonable Further Progress (RFP). On July 17, 2014, CARB submitted the 2012 base year emissions inventory for all California non-attainment areas to EPA. The 2012 base year emissions inventory is used for all growth scenarios in this Attainment Plan. In 2014, ARB established 2012 as the emission inventory base year for 8-hour ozone planning purposes. The 2012 emission inventory at the District for permits subject to Rule 410 was 0.54 tons per day (tpd) of VOC emissions. There were approximately 8 permitted facilities utilizing organic solvents in 2012.

Table 1 summarizes the estimated emission reductions from Rule amendments. The calculation methodology is outlined in Section II of this appendix. Overall, the proposed amendments are estimated to have a total of about 0.18 tons per day of VOC emission reductions, which is about a 34% reduction to the adjusted 2012 baseline VOC emissions.

Table 1-Estimated Emission Reduction

Category	2012 Baseline VOC Emissions (tpd)	Estimated Reduction (%)	Estimated VOC Emission Reductions (tpd)
Rule 410 –Lower VOC Emission Limit	0.54	34%	0.183

**II. Emission Reduction Analysis**

Operators in many different types of industries perform solvent cleaning and solvent degreasing. Under current rule provisions, a daily VOC emission limit is listed for cleaning materials and the allowable content limit depends on the particular cleaning operation.

**A. VOC Emission Inventory for 2012**

Emission inventory codes (EIC) describe the source category and consist of a 14-digit code. The first three digits generally represent a general emission group; the second three digits are representing a specific operation, followed by four digits for listing the material. The final four digits are used only for certain categories, are specific to the individual air district, and represent even more refined information about the emission source. For this rule project, District staff reviewed all of the EICs assigned to the District to determine which apply to solvent cleaning or solvent degreasing. District staff tracks certain cleaning categories using organic compounds that are exempt from being counted as VOCs. One example of this is EIC 230-240-3800-0000, which is for the use of

## Rule 410 – Emission Reduction Analysis

acetone during cleaning and thinning in the industry “coatings and other related processes.” The emission inventory for exempt compound EICs was set to zero. Within the inventory, there are some EICs that apply to both thinning and cleaning or to both thinning and coatings. Initial VOC emission inventory for solvent cleaning and degreasing is estimated to be 0.54 tons VOC per day, using 2012 emissions data from the District’s 8-hour Ozone Plan and published by the California Air Resources Board.

### B. VOC Emission Reductions

#### 1. General Cleaning

Emission reductions are the difference between the current emissions claimed for this rule project minus the emissions after rule implementation.

Emission Reduction = Current Emissions - Emissions after Implementation

For purposes of this emission reduction analysis District staff is making the following assumptions:

- When an operator uses emission control systems to comply with rule requirements, the total VOC emissions reported on the permit are from the system exhaust.

The estimated VOC emission reductions (ER) due to rule amendment to miscellaneous solvents VOC limits was calculated using the following equation:

$$ER = \left( \frac{\text{Current VOC limit} - \text{Proposed VOC limit}}{\text{Current VOC limit}} \right) \times (\text{Emissions})$$

If contingency measures are triggered, this rule project would change the allowable VOC emission limit for general cleaning and surface preparation from 40 pounds per day to 15 pounds per day. This represents a 62.5% reduction in the VOC emission limit. For all emission inventory categories associated with solvent cleaning, a factor of 34% was applied (based on average facility solvent usage) to the current emission inventory to get the estimated emission reductions. The rule amendments will reduce most solvent cleaning categories by a total of about 0.182 tons VOC per day, as shown in Table 2.

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Rule 410 – Emission Reduction Analysis

Table 2-EICs and VOC Emission Calculations for General Cleaning, non-printing, non-architectural process

<b>EIC</b>	<b>VOC</b>	<b>2012 Emissions (tpd)</b>	<b>Estimated VOC Emission Reductions (tpd)</b>
220-204-0500-0000	Y	0.51	0.173
220-204-3022-0000	Y	0.00	0.00
220-204-3083-0000	N	0.00	0.00
220-204-3204-0000	Y	0.00	0.00
220-204-3333-0000	Y	0.00	0.00
220-204-8106-0000	Y	0.01	0.003
220-206-3083-0000	N	0.00	0.00
220-206-3344-0000	N	0.00	0.00
220-208-0500-0000	Y	0.01	0.003
220-208-3022-0000	Y	0.00	0.00
220-208-3176-0000	Y	0.00	0.00
220-208-3204-0000	Y	0.01	0.003
220-208-3339-0000	Y	0.00	0.00
220-208-8104-0000	Y	0.00	0.00
<b>Total Emissions</b>		<b>0.54</b>	<b>0.182</b>

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**APPENDIX D**

**AMENDED RULE 410**

**COST EFFECTIVENESS ANALYSIS**

**I. INTRODUCTION**

The California Health and Safety Code 40920.6(a) requires the Eastern Kern Air Pollution Control District (District) to conduct both an "absolute" cost effectiveness analysis and an "incremental" cost effectiveness analysis of available emission control options prior to adopting a Best Available Retrofit Control Technology (BARCT) rule. The purpose of conducting a cost effectiveness analysis is to evaluate the economic reasonableness of the pollution control measure or rule. The analysis also serves as a guideline in developing the control requirements of a rule. Incremental cost effectiveness is intended to measure the change in costs (in \$/year) and emissions reductions (in tons reduce/year) between two progressively more effective control options or technologies.

Absolute cost effectiveness of a control option is the added annual cost, in dollars per year (\$/yr), of a control technology or technique, divided by the emission reduction achieved, in tons reduced per year. The costs include capital equipment costs, engineering design costs, labor and maintenance costs. Incremental cost effectiveness is intended to measure the change in costs, in \$/yr, and change in emissions reductions in tons reduced/year between two progressively more effective control options or technologies. The incremental cost effectiveness compares the differences in costs and the differences in emissions reductions of candidate control options. Incremental cost effectiveness does not reveal the emission reduction potential of the control options. Unlike the absolute cost effectiveness analysis that identifies the control option with the greatest emission reduction, incremental cost effectiveness does not present any correlation between emissions reductions and cost effectiveness. Therefore, the relative values produced in the incremental cost effectiveness analysis and the absolute cost effectiveness values are not comparable and cannot be evaluated similarly.

District staff used available cost information contained in technical reports, searched EPA's Control Techniques Guidelines (CTG), distributors, and staff reports from other Air Districts to conduct a cost effectiveness analysis of the proposed requirements of Rule 410. Table 1 shows the total estimated costs and cost effectiveness for the proposed changes to Rule 410.

Table 1-Summary of Costs and Cost Effectiveness

	Net Annual Cost (\$/yr)		Cost Effectiveness (\$/ton VOC reduced)	
	Low End	High End	Low End	High End
Lower Facility VOC emission limit	\$100,113	\$1,132,533	\$1,499	\$16,957

## II. COST EFFECTIVENESS ANALYSIS

### A. Background

Typically, VOC emission control systems utilize a regenerative thermal oxidizer (RTO) or carbon adsorption system as the VOC destruction device. A single RTO costs hundreds of thousands of dollars to buy and install and tens of thousands of dollars to operate each year. It is believed that operators will comply with the VOC emission limits proposed by this rule project by reformulating, diluting, or improving usage efficiency of the current cleaning solvents, since it would be more economical to change solvents rather than install capital equipment like a RTO to meet rule requirements.

The first category of changes is to reduce the allowed VOC emission limit from 40 pounds per day to 27 pounds per day or 833 pounds per year per facility. The second category of changes which is only applicable upon the District failing to attain the 2008 Ozone National Ambient Air Quality Standard. An operator shall not emit to the atmosphere VOCs in excess of 15 pounds per day or 450 pounds per month. Operators are expected to reduce the VOC content of the currently used material by thinning it with additional water or other exempt solvent (e.g., acetone or methyl acetate).

### B. Cost Calculations

In 2007, based on the SCAQMD staff report, high-VOC solvent cleaner averaged \$5 per gallon. The low-VOC cleaner ranged in price from \$6 to \$21 per gallon. Operators are assumed to already be using the high-VOC material, so the difference between the low-VOC and the high-VOC cleaners multiplied by the estimated annual cleaning material solvent would be the cost to operations from the proposed rule amendments. District assumes all high-VOC solvent consist of petroleum naphtha with a VOC content of 6.3 lbs/gal. This means that the cost of compliance for reducing application VOC emissions is estimated between \$1 and \$16 per gallon. Current estimated usage of high-VOC solvent is about 62,500 gallons per year. Acetone is an exempt compound that has some solvent properties, but also is more volatile than many of the solvents it would replace. District staff assumed that 10% more acetone/methyl acetate would be used to compensate for additional evaporation compared to current solvent usage or about 68,800 gallons per year of low-VOC material. By subtracting the current annual cost of high-VOC solvent cleaning material from the projected low-VOC cleaning material cost, estimated annual compliance cost would range from \$100,000 and \$1.1 million.

Rule 410 – Cost Effectiveness

Table 1-Annual Cost for Complying with Reduced VOC Emission Limits by Solvent Substitution

	Annual Usage (gallons/year)	Cost per gallon	Annual Cost (\$/yr)	Net cost increase (\$/yr)
Current High-VOC Solvent Usage	62,571	5\$	\$312,855	--
Low VOC-replacement low-cost option	68,828	6\$	\$412,968	\$100,113
High VOC-replacement high-cost solvent option	68,828	21\$	\$1,445,388	\$1,132,533

*Annual Cost for Complying with Reduced VOC Emission Limits via Solvent Dilution*

The difference in cost between the current compliant cleaning solvent and the proposed cleaning solvent is zero, since the operator could use water to dilute the current cleaning solvent to meet the lower VOC content limit.

**C. Absolute Cost Effectiveness Analysis**

The absolute cost effectiveness is the added cost of implementing the proposed amendments divided by the estimated emission reductions. As outlined above, the area where VOC emission reductions are expected is from the lower annual facility-wide VOC emission limits.

Table 2 below summarizes the costs and cost effectiveness for each of these changes. For amendments to Rule 410, the range in cost effectiveness is about \$1,500 to \$17,000 per ton VOC removed.

Cost effectiveness is calculated as follows:  
 Emission reduction from Appendix C: 66.79 ton VOC/yr  
 Cost Effectiveness= Net annual cost/ 66.79 tons VOC/yr

Table 2: Costs and Cost Effectiveness Analysis

	Net Annual Cost (\$/yr)		Estimated VOC Emission Reductions (tpy)	Cost Effectiveness (\$/ton VOC reduced)	
	Low End	High End		Low End	High End
Lower Facility VOC emission limit	\$100,113	\$1,132,533	66.79	\$1,499	\$16,957

**D. Incremental Cost Effectiveness Analysis**

Incremental cost effectiveness is intended to measure the change in costs, in \$/yr, and change in emissions reductions in tons reduced/year between two progressively more effective control options or technologies. For this rule project, the limits are considered the lowest achieved in practice. Additionally, solvent cleaning for this application is expected to be non-point and intermittent in nature which pose additional challenges for installing VOC control system e.g. thermal oxidizer. Installing VOC control equipment has not been analyzed at this point of rule development process as operators are expected to comply primarily via solvent substitution, dilution methods. This means that there are no additional VOC emission reductions to be realized at this time. Therefore, no incremental cost effectiveness analysis was conducted.

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**APPENDIX E**  
**AMENDED RULE 410**  
**CONSISTENCY ANALYSIS**

## Rule 410 – Rule Consistency Analysis

### I. Background

Pursuant to Section 40727.2 of the California Health and Safety Code, prior to adopting, amending, or repealing a rule or regulation, the District is required to perform a written analysis that identifies and compares the air pollution control elements of the rule or regulation with corresponding elements of existing or proposed District and United States Environmental Protection Agency (EPA) rules, regulations, and guidelines that apply to the same source category. The elements analyzed are emission standards, monitoring and testing, and recordkeeping and reporting requirements. The analysis is detailed in Section II of this report. Conclusions based on the analysis are shown in Section III.

### II. Rule Consistency Analysis

Facilities subject to District Rule 410 could be subject to other District Rules including:

- Rule 210.1 New and Modified Stationary Source Review
- Rule 422 New Source Performance Standards
- Rule 423 National Emissions Standards for Hazardous Air Pollutants
- Rule 401 Visible Emissions
- Rule 419 Nuisance

After review, the District determined the above-listed Rules are not in conflict with, nor are they inconsistent with the requirements of proposed Rule 410.

District staff reviewed EPA rules, regulations, and guidelines, as well as District rules for the source categories covered by the eleven District rules in this rule project. The analysis was confined to those provisions that refer to organic solvent usage for miscellaneous source categories. Emission limits, operating parameters, monitoring, testing, records, and reporting requirements from processes other than solvent usage associated with the source category were ignored for purposes of the rule consistency analysis.

#### A. Existing or Proposed Federal Rules, Regulations, and Guidelines

##### 1. Control Techniques Guidelines (CTGs)

There are two CTGs that have solvent cleaning provisions. These applicable CTG are listed in Table 1.

Table 1-CTGs with Solvent Provisions

CTG Number/ Title	Operation Covered
<b>EPA-450/2-77-022</b> Control of Volatile Organic Emissions from Solvent Metal Cleaning	Facilities that use a degreaser to clean
<b>EPA-453/R-06-001</b> Control Techniques for Industrial Cleaning Solvents	Cleaning with solvent in industrial settings

The CTG for solvent metal cleaning relates to degreasers. Rule 410.3 addresses these units. Because this CTG was approved in 1977, all of the requirements related to solvent degreasers have been incorporated into Rule 410.3 by previous rule projects.

The CTG for cleaning in industrial settings recommends a general VOC content limit of 50 g/L with some exceptions, mostly for cleaning of printing equipment. Cleaning requirements including the 50 g/L limits have previously been incorporated into source specific coating Rule projects.

These Rule projects incorporates a VOC content of 25 g/L for most cleaning operations, which is lower than the CTG-recommended content limit of 50 g/L. Hence, the proposed amendments to Rule 410 would not conflict with federal CTGs.

**2. New Performance Standards (NSPS)**

NSPS requirements are organized by source category in 40 CFR Part 60. The District has incorporated the NSPS by reference, meaning that District Rule 422 lists all of the NSPSs and the requirements of these NSPSs have been adopted by reference. District Rule 422 lists delegated NSPSs. None of these NSPSs have solvent cleaning as part of its requirements. Therefore, this rule project is neither inconsistent with nor conflicts with any requirement of an NSPS.

**3. National Emission Standards for Hazardous Air Pollutants (NESHAPs)**

NESHAPs are requirements contained in 40 CFR 61 and 40 CFR 63. As with the NSPSs, the District has incorporated the requirements of the NESHAPS into its rules and District Rule 423. There are no NESHAPs in 40 CFR 61 with solvent cleaning requirements. Table 2 lists the NESHAPs from 40 CFR 63 with solvent cleaning provisions. Of the NESHAPs in Table 2, 40 CFR 63 Subpart T applies to District Rule 410.3 for solvent degreasers. The District rules that apply to the source categories for the remaining NESHAPs are subject to solvent cleaning requirements under the following source specific rules: 410.8, Aerospace Assembly and Coating Operations, 410.4, Metal, Plastic, and Pleasure Craft Parts and Products Coating Operations.

Table 2- NESHAPs with Solvent Cleaning Provisions

<b>40 CFR 63 Subpart:</b>	<b>Source Category</b>
T	Halogenated Solvent Cleaning
GG	Aerospace Manufacturing and Rework
WW	Boat Manufacturing - Resin and Gel Coat Application Equipment Cleaning Operations
III	Flexible Polyurethane Foam Production

In complying with the District rules for the above source categories, there is no conflict with NESHAP.

**III. RESULTS OF RULE CONSISTENCY ANALYSIS**

District staff found that facilities could comply with the proposed amendments to organic solvents Rule as well as all other existing or proposed District rules. Based on the above analysis, District staff found that the proposed amendments to Rule 410 would not conflict with federal rules, regulations, or policies covering similar stationary sources.

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**APPENDIX F:**

**RESCIND RULE 410.2**

**DISPOSAL AND EVAPORATION OF SOLVENTS**

**RULE 410.2 Disposal and Evaporation of Solvents** - Adopted 4/18/72, Amended 1/9/79,  
Renumbered 5/89, Rescinded 9/1/22

I. A person shall not during any one day dispose of a total of more than 1 1/2 gallons of any photochemically reactive solvent as defined in Rule 410.X., or of any material containing more than 1 1/2 gallons of any such photochemically reactive solvent into the atmosphere.

**APPENDIX G:**  
**AMENDED RULE 410**  
**RESPONSE TO COMMENTS**

## **I. PUBLIC WORKSHOP**

On May 17, 2022 the District held a public Rule development workshop at the District's field Office located in Tehachapi CA, to present proposed revisions to Rule 410, Organic Solvents. The District submitted copies of the proposed revisions to the Air Resources Board (ARB) and the Region IX office of the U.S. Environmental Protection Agency (EPA) in June 2022 for an initial 30-day review. Comments on proposed amendments for Rule 410 are summarized below:

## **II. CARB/EPA COMMENTS**

CARB and EPA did not provide specific comments on the proposed amendments. However, the District was informed that RFP requirements under Section 182 of the Clean Air Act were not being met, so proposed amendments could no longer be contingencies and are required to be implemented upon Rule adoption. CARB and EPA would review the Rule amendments and provide comment after they are revised to meet this new requirement.

## **III. INDUSTRY/PUBLIC COMMENTS**

### **Edwards Air Force Base (EAFB):**

1. We recommend adding clarification in this rule that organic materials used for disinfection purposes, especially isopropyl alcohol, is considered an exempt application under this rule. While some disinfectants may be used as solvents as described under the proposed definition, there are few choices in organic or inorganic chemicals that can be used as disinfectants. Certain alcohols, aldehydes, and phenolic compounds used as disinfectants may also be used as solvents in industrial applications. Non-organic disinfectants that may not be compatible in some of our operations include hydrogen peroxides, chlorine, and ammonia derivatives. Some disinfectant products may be covered under the California Air Resources Board Consumer Products Rules, 17 CCR 94500 – 94555. Many disinfectant products purchased in bulk or for industrial purposes may be outside CARB's regulation and may be considered under this EKAPCD rule. We request to add an exemption to the provisions and / or clarification in the solvent definition to exempt the use as a disinfectant, as defined by CARB's or other similar definition.

*II. M. Solvent: any liquid containing an organic compound or combination of organic compounds used as diluent, thinner, dissolver, viscosity reducer, cleaning agent, or other similar uses. These liquids are principally derived from petroleum and include petroleum distillates, chlorinated hydrocarbons, chlorofluorocarbons, ketones, and alcohols. Solutions, emulsions, and dispersions of water and soap, or water and detergent, are not considered organic solvents. Soaps and detergents are considered water based surfactants. Disinfectants are not considered solvents while applied for the purpose of destroying bacteria, viruses, or fungi.*

*“II. Q. “Disinfectant” means a product that is labeled to destroy or irreversibly inactivate infectious or other undesirable bacteria, pathogenic fungi, or viruses on surfaces or inanimate objects and whose label is registered as a “disinfectant” under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA, 7 U.S.C. 136, et seq.). Products that are labeled as both a “sanitizer” and a “disinfectant” are considered disinfectants.”*

*“III. F. Provisions of this rule do not apply to organic compounds while applied to surfaces for the specific purpose of disinfection. Disinfectants purchased and applied in consumer applications subject to the requirement of California Air Resources Board (CARB) Consumer Products Rules, 17 CCR 94500 – 94555 are exempt from this rule. Disinfectants purchased in bulk or not subject to CARB Consumer Products Rules are also not subject to the requirements of this rule.”*

**District:**

In accordance with suggested comments, District added the following language to the amended Rule 410:

Section II.D (Definitions): “Disinfectant: means a product that is labeled to destroy or irreversibly inactivate infectious or other undesirable bacteria, pathogenic fungi, or viruses on surfaces or inanimate objects and whose label is registered as a “disinfectant” under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA, 7 U.S.C. 136, et seq.). Products that are labeled as both a “sanitizer” and a “disinfectant” are considered disinfectants.”

Section II.N (Definition for solvent): “Disinfectants are not considered solvents while applied for the purpose of destroying bacteria, viruses, or fungi”

Section III.F (Exemptions): “Provisions of this rule do not apply to organic compounds while applied to surfaces for the specific purpose of disinfection. Disinfectants purchased and applied in consumer applications subject to the requirement of California Air Resources Board (CARB) Consumer Products Rules, 17 CCR 94500 – 94555 are exempt from this rule. Disinfectants purchased in bulk or not subject to CARB Consumer Products Rules are also not subject to the requirements of this rule.”

Therefore, any solution used as a Disinfectant will not be regulated under Rule 410.

**Edwards Air Force Base (EAFB):**

2. We recommend reducing the cost and burden of replacing non-compliant product by extending the compliance deadline in IV. F to a phased approach beginning on or after XX XX, 2023 to XX XX 2025.

Although compliance with this emission limit may be met with a few different methods, many of these methods may take longer than one year to implement. Product reformulation, process changes, and improved efficiency need to be evaluated and approved by Headquarters of the Department of the Air Force (HAF). The approval process may take years to properly demonstrate the new product or method meets the standard or technical order. Standards and technical orders are developed on a nationwide basis and are not limited to statewide formulas or methods. This contributes to the long timeline for changing methods and formulas. A phased reduction would provide the EKAPCD with measurable reductions of emissions while alleviating the burden of reformulating all products, processes, and methods within a short timeframe.

*“IV. F. Beginning On and after XX XX, 2023, from all VOC-containing materials, equipment, and processes subject to this rule, an operator shall annually reduce the amount of VOCs not emitted to the atmosphere by 20% of baseline VOCs in excess of until XX XX 2025. On and after XX XX 2025, from all VOC-containing materials, equipment, and processes subject to this rule, an operator shall not emit to the atmosphere VOCs in excess of 833 pounds VOC per calendar month per facility.*

*1. Compliance with provisions above may be obtained through use of any of the following or any combination thereof:*

- a. Product reformulation or substitution;*
- b. Process changes;*
- c. Improvement of operation efficiency;*
- d. Development of innovative technology;”*

**District:**

Based on comments received. District will extend compliance deadline from 180 days from Rule adoption to 18 months from Rule adoption until March 8, 2024. Moreover, an additional 18 months would be allowed to meet full compliance if facility exceeds allowed VOC emission levels. The following compliance schedule language would be added to the proposed Rule amendments:

**“Compliance Schedule**

- A. An owner/operator of an existing facility subject to this Rule and not meeting VOC emission limits listed in section IV.F shall comply with the following schedule:
  - 1. By March 31, 2023, submit to the Control Officer an Emission Control Plan pursuant to section V.B, and complete application for an Authority to Construct, if necessary to modify potential to emit.

2. By September 8, 2025, demonstrate full compliance with Section IV.F of this Rule”

**Edwards Air Force Base (EAFB):**

3. We respectfully request to extend the compliance timeline for the contingency provision to 180 days instead of sixty days after the effective date of EPA non-attainment status determination. This is similar to the timeline in proposed changes to Rule 410.8 Aerospace Coatings, which requires an emissions control plan at 60 days and allows for 180 days to implement the changes as outlined in the emissions control plan. The short 60 day timeline to implement changes in processes and methods creates an undue burden on the HAF technical order approval process as previously mentioned. Construction or adding new control technology would not be possible to achieve in 60 days. Projects of this magnitude would require at least one year to implement. Therefore, compliance would need to be met through product reformulation or other process improvements.

Additionally, the purchase and delivery of materials may frequently be delayed longer than 60 days when there is an unexpected increase in demand as seen recently with COVID shipment delays. Due to federal contract requirements, it may take several months to properly configure and approve an account for a new supplier prior to the purchase of products. Therefore, we propose the language is changed to 180 days.

*“IV. G. Contingency Provision: Notwithstanding Section IV.F, on and after sixty one hundred eighty days following the effective date of EPA final determination that one or both of the conditions described in Clean Air Act Sections 172(c)(9) or 182(c)(9) have occurred in Eastern Kern County regarding the 2008 or 2015 8-hour Ozone National Ambient Air Quality Standard, an operator shall not emit to the atmosphere VOCs in excess of 450 pounds VOC per calendar month per facility from all VOC-containing materials, equipment, and processes subject to this rule.”*

**District:**

Contingency provision language will be dropped in accordance with CARB/EPA comments. The original VOC contingency provisions will now be required under section IV.F of the propose Rule amendments. Additionally, a compliance schedule has been added in accordance with EAFB comments which extends original compliance timeline. Therefore, additionally extensions to compliance timeline for contingency provisions are not required.

**Edwards Air Force Base (EAFB):**

4. We request to add the option to use an alternate control efficiency demonstration as approved by EPA, ARB, and the APCO. The capture efficiency method listed in the Rule allows for other approved methods from the EPA Test Method; however, the control efficiency does not specifically state that other test methods may be approved. Edwards AFB currently operates a carbon adsorption and HEPA particulate filter combination booth to control VOC emissions from aerospace coating operations. Edwards AFB annually verifies the capture and control efficiency of the carbon booth meets specifications by testing the condition of the activated carbon using APCO approved ASTM methods D3467 and D5528. This test method is effective and is safer for personnel than attempting to perform an EPA Method stack test. Edwards AFB requests the possibility to use this or other alternate approved test methods in the event that non-aerospace solvents may be permitted in this or similar controlled paint booth.

*“VI. B. Determination of Overall Capture and Control Efficiency of VOC Emission Control Devices*

*1. The capture efficiency of a VOC emission control system’s collection device(s) shall be determined according to EPA’s “Guidelines for Determining Capture Efficiency,” January 9, 1995 and 40 CFR 51, Appendix M, Test Methods 204-204F, as applicable, or any other method approved by EPA, ARB, and the APCO.*

*2. The control efficiency of the VOC emission control system’s control device shall be determined by using EPA Methods 2, 2A, or 2D for measuring flow rates and EPA Method 25, 25A, or 25B for measuring total gaseous organic concentrations at the inlet and outlet of the control device. EPA Method 18 or CARB Method 422 shall be used to determine the emissions of exempt compounds. Other ARB, EPA, and ASTM methods verifying VOC emission control may be authorized by the APCO as applicable. The control efficiency of the VOC emission control system’s control device shall be calculated by using the following equation:*

$$CECONTROL = [1 - (VOCOUT / VOCIN)] \times 100\%$$

*Where:*

*CECONTROL = Control Efficiency, in percent.*

*VOCIN = VOC content, in grams/liter, less exempt compounds and water, into the control device.*

*VOCOUT = VOC content, in grams/liter, less exempt compounds and water, out of the control device.”*

**District:**

District added language as suggested by public comments. Provisions for determination of overall capture and control efficiency now reads as follows:

“The control efficiency of the VOC emission control system’s control device shall be determined by using EPA Methods 2, 2A, or 2D for measuring flow rates and EPA Method 25, 25A, or 25B for measuring total gaseous organic concentrations at the inlet and outlet of the control device. EPA Method 18 or CARB Method 422 shall be used to determine the emissions of exempt compounds. Other ARB, EPA, and ASTM methods verifying VOC emission control may be authorized by the APCO as applicable. The control efficiency of the VOC emission control system’s control device shall be calculated by using the following equation  
 $CECONTROL = [1 - (VOCOUT / VOCIN)] \times 100\%$

*Where:*

*CECONTROL = Control Efficiency, in percent.*

*VOCIN = VOC content, in grams/liter, less exempt compounds and water, into the control device.*

*VOCOUT = VOC content, in grams/liter, less exempt compounds and water, out of the control device.”*