

Working Group Meeting #2

July 9, 2024, 10:30 a.m.

Proposed Amended Rule 1401 – New Source Review of Toxic Air Contaminants

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Agenda



Working Group Meeting #1 Recap

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- Presented background information:

South Coast AQMD rule development process

Rule 1401 background

- Summarized proposed amendments to Rule 1401:

Amendments to Table I list of toxic air contaminants based on California Office of Environmental Health Hazard Assessment (OEHHA) updates

Stakeholder Comments From Working Group Meeting #1

Comment

- More information added to Table I (e.g., identifying compounds as VOC or particulate) could be useful

Response

- Table I includes the Chemical Abstract Service (CAS) number or, where applicable, the 4-digit Air Toxics Hot Spots Emission Inventory Code
- Additional information is included in other resources (e.g., OEHHA/CARB Consolidated Table of Approved Risk Assessment Health Values, etc.)
- PAR 1401 may add child compounds to Table I consistent with OEHHA/CARB Consolidated Table (e.g., under existing beryllium and beryllium compounds listing [CAS #7440-41-7] add beryllium oxide [CAS #1304-56-9])

Proposed Rule Amendments

Background

- Rule 1401 applies when a facility submits a permit application for a new, modified, or relocated equipment or source that emits any toxic air contaminant listed in Rule 1401 Table I

TABLE I TOXIC AIR CONTAMINANTS				
CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
75-07-0	acetaldehyde	December 7, 1990	September 8, 1998	September 10, 2010
60-35-5	acetamide	January 8, 1999		
107-02-8	acrolein		June 15, 2001	August 13, 1999
79-06-1	acrylamide (or propenamide)	December 7, 1990	**	
79-10-7	acrylic acid		*	August 13, 1999
107-13-1	acrylonitrile (or vinyl cyanide)	December 7, 1990	May 3, 2002	
107-05-1	allyl chloride	January 8, 1999		
117-79-3	aminoanthraquinone, 2-	January 8, 1999		

- Existing permits with no further permit action are not impacted by PAR 1401

Proposed Amendments to Rule 1401

- Table I will be updated to include new compounds identified by California Office of Environmental Health Hazard Assessment (OEHHA)
- New compounds to be added include:

Compound Name	CAS Number
1-bromopropane	106-94-5
Trivalent chromium	16065-83-1
Parachlorobenzotrifluoride (PCBTF)	98-56-6
Tertiary Butyl Acetate (TBAc)	540-88-5
Hexamethylene Diisocyanate (HDI) (Monomer)	822-06-0
Polymeric Hexamethylene Diisocyanate	1221*
Cobalt	7440-48-4
Trimethylbenzenes	25551-13-7

*4-digit Air Toxics Hot Spots Emission Inventory Code assigned by CARB

Regulatory Impacts

Evaluation of Regulatory Impacts

- To evaluate potential impacts to future permit evaluations resulting from adding compounds to Table I, the following general process is used:
 - STEP 1: Identify potential emission source by evaluating the following:
 - Technical Support Documents by OEHHA
 - Annual Emission Reporting (AER)
 - Permit applications (2018 - 2023)
 - STEP 2: Evaluate the potential impacts
 - Evaluation method dependent on the type of source and other available information
 - Example: reviewed a representative sample of permit applications (2018-2023) for general spray booths and autobody shops
- Results of preliminary evaluation provided in subsequent slides

1-bromopropane (CAS 106-94-5)

Noncancer Risk Factors	Cancer Risk Factors
To be added	To be added

- 1-bromopropane is a colorless liquid at room temperature
- Sources include solvent vehicle for adhesives in laminates and foam products, degreasing/cleaning agent for metals, metal products, plastics, optics, and electronics, and alternative solvent in modified perchloroethylene dry-cleaning machines*
- Based on Annual Emission Reporting and permitting data, the main sources at South Coast AQMD are cleaning solvents and dry cleaners

*<https://oehha.ca.gov/media/downloads/crn/1-bpsrprel052823.pdf>

1-bromopropane (continued)

Cleaning Solvents

- In Annual Emission Reporting, one facility reported 1-bromopropane emissions due to solvent cleaning operations
 - Throughput is low

Dry Cleaning

- In January 2007, CARB released a list of approved alternative solvents for dry cleaners
 - Most alternatives do not contain 1-bromopropane

Preliminary Assessment: The addition of 1-bromopropane is expected to have minimal impacts for permitting new, modified, or relocated equipment due to alternative solvents available for dry cleaners and low throughput in solvent cleaning operations

Trivalent Chromium

Noncancer Risk Factors	Cancer Risk Factors
To be added	Not applicable

- Chromium (Cr) is a heavy metal that can exist in oxidation states ranging from -2 to +6 with trivalent chromium denoted as Cr⁺³
- Sources of trivalent chromium include dietary supplements, pigments, catalysts, anti-corrosives, leather tanning agents, decorative plating media, and cement and concrete*
- Based on Annual Emission Reporting and permitting data, the main source at South Coast AQMD is decorative chrome plating

*<https://oehha.ca.gov/media/downloads/air/document/finalcreeirel083122.pdf>

Trivalent Chromium (continued)

- In 2023, CARB adopted the Hexavalent Chromium Airborne Toxic Control Measure (ATCM) for chrome plating and chromic acid anodizing operations requiring hexavalent chromium to be phased out by January 1, 2030
 - Majority of decorative chrome plating facilities use hexavalent chromium, which has a cancer potency factor, and some facilities may switch to plating alternatives such as trivalent chromium
 - Trivalent chromium does not have a cancer potency factor
- **Preliminary Assessment:** The addition of trivalent chromium is expected to have minimal impacts for permitting new, modified, or relocated equipment due to noncancer risk factors

Hexamethylene Diisocyanate (HDI) (Monomer and Polyisocyanates)

	Noncancer Risk Factors	Cancer Risk Factors
HDI (monomer)	To be added	Not applicable
Polymeric HDI	To be added	Not applicable

- HDI monomer is an organic compound that is a clear to slightly yellow liquid
- Polyisocyanates or Polymeric HDI is the term often used to refer to a mixture of HDI monomer and various higher molecular weight diisocyanate reaction products*
- Sources include hardeners for automobile and airplane polyurethane spray paints, including primers, sealers, and clear coats, and coatings for outdoor furniture, parquet and industrial wood, and architectural finishing
- Based on Annual Emission Reporting and permitting data, the main sources at South Coast AQMD are spray booths using hardeners and spraying coatings

Hexamethylene Diisocyanate (HDI) (Monomer and Polyisocyanates) (continued)

- Staff conducted a review of 90 spray booth permit applications (2018-2023)
 - Monomeric HDI present in products such as hardeners and is less than or equal to 1% by weight
 - Polymeric HDI identified in higher concentrations and could be up to 62% by weight
 - During the chemical reaction process, a portion of HDI may become part of the coating and does not become airborne
 - Additional evaluation needed

Preliminary Assessment:

- The additional risk from adding monomeric HDI is expected to have minimal impact on permitting new, modified, or relocated equipment due to relatively lower concentrations
- Additional analysis is needed to determine the impacts from polymeric HDI

Trimethylbenzene

Noncancer Risk Factors	Cancer Risk Factors
To be added	Not applicable

- Trimethylbenzene is a colorless liquid that exists in three isomeric forms:
 - 1,2,3-trimethylbenzene
 - 1,2,4-trimethylbenzene
 - 1,3,5-trimethylbenzene
- Sources of trimethylbenzene include surface coatings, paints, printing inks, cleaning fluids, petroleum refinery distillation products (white spirit, high flash point naphtha, and gasoline), steel making facilities, and coal fired plants*
- Based on Annual Emission Reporting and permitting data, the primary source at South Coast AQMD is coatings

Trimethylbenzene (continued)

- Staff conducted a review of 77 coating applications that are currently open and found trimethylbenzene in 27 applications
 - 25 applications had trimethylbenzene concentration being less than or equal to 5% by weight
- **Preliminary Assessment:** The additional risk from adding trimethylbenzene is expected to have minimal impact on permitting new, modified, or relocated equipment due to relatively lower concentrations and noncancerous risks

Cobalt

	Noncancer Risk Factors	Cancer Risk Factors
Cobalt (insoluble)	Not applicable	To be added
Cobalt (soluble)	Not applicable	To be added

- Cobalt is a hard, somewhat malleable metal
- Sources of cobalt include the petroleum industry, concrete and cement manufacturing facilities, electronic computer manufacturers, semiconductor and electronic components facilities, military and commercial aerospace product and parts manufacturing, tungsten carbide and other super alloy manufacturing, mining and refining operations, lumber mills, and battery manufacturers*
- Based on Annual Emission Reporting and permitting data, the primary source in South Coast AQMD is abrasive blasting
 - Reviewed 95 permit applications in resin operations and semiconductor manufacturing and cobalt was not listed in any of the Safety Data Sheets (SDS)

* <https://oehha.ca.gov/media/downloads/crnrfinalcobalt080423.pdf>

Cobalt (continued)

- Staff reviewed 30 permit applications in abrasive blasting and found cobalt listed in 5 applications
 - Abrasive blasting operations have several options to further reduce cancer risk, including reducing horsepower, reducing nozzle size/pressure, installing high efficiency filters, adding an operating time limit, and changing type of steel used
- A recent permit application used cobalt as a hexavalent chromium plating alternative
 - Other alternatives such as trivalent chromium are available, and CARB is providing funding to explore less toxic plating alternatives
- **Preliminary Assessment:** The additional risk from adding cobalt is expected to have minimal impact on permitting new, modified, or relocated equipment due to:
 - Abrasive blasting operations having several options to further reduce cancer risk
 - Other chromium plating alternatives are available such as trivalent chromium

Tertiary-butyl-acetate (TBAc)

Noncancer Risk Factors	Cancer Risk Factors
Not applicable	To be added

- TBAc is colorless flammable liquid
- Sources include industrial coatings, inks, adhesives, industrial cleaners, and degreasers*
- Based on Annual Emission Reporting and permitting data, the primary source at South Coast AQMD is coatings

*<https://oehha.ca.gov/media/downloads/crnrtbaccanceriur081018.pdf>

Tertiary-butyl-acetate (continued)

- Staff conducted a review of 90 spray booth permit applications (2018-2023)
 - 8 facilities use products containing TBAC with concentrations ranging from 3% to 68% (median is 20%)
 - Certain products contain both TBAC and PCBTF
 - Depending on concentration of each compound, either TBAC or PCBTF could be the driving risk factor for the product
 - Seeking information about alternative coatings with no TBAC
- **Preliminary Assessment:** The additional risk from adding TBAC is expected to have significant impacts on permitting new, modified, or relocated equipment for products with a higher concentration of TBAC

Parachlorobenzotrifluoride (PCBTF)

Noncancer Risk Factors	Cancer Risk Factors
Not applicable	To be added

- Also known as 1-chloro-4 (Trifluoromethyl) benzene and is a colorless liquid
- Sources of PCBTF include preparation of dyes, pharmaceuticals, pesticides, and as a solvent in paints, inks, and high-solids coating formulations, as well as for metal cleaning*
- Based on Annual Emission Reporting and permitting data, the main sources at South Coast AQMD are:
 - Solvent cleaners for lithographic printing operations
 - Coatings (hardeners, activators, reducers)

*<https://oehha.ca.gov/media/downloads/crn/pcbtfiur080720.pdf>

PCBTF (continued)

- Staff conducted a review of 10 lithographic permit applications (2018-2023)
 - 3 facilities were identified to use blanket wash solutions containing PCBTF with concentration ranging from 20% to 80%
 - Ongoing evaluation of alternatives as part of PAR 1171 – Solvent Cleaning Operations rule development
- Staff conducted a review of 90 spray booth permit applications (2018-2023)
 - 51 applications showed use of products with PCBTF (27 facilities with general spray booths and 24 autobody facilities)
 - Concentration of PCBTF range from 3% to 100%
- **Preliminary Assessment:** The additional risk from adding PCBTF is expected to have a significant impact on permitting new, modified, or relocated equipment due to:
 - New cancer risk factors driving risk
 - PCBTF is widely used
 - Concentration could be high in certain coatings



Autobody Spray Booth Example

- Staff evaluated an autobody spray booth permit application submitted in 2021 due to the application containing new PAR 1401 compounds such as PCBTF, TBAC, polymeric HDI, and trimethylbenzene
 - Included a coating that contains 50% PCBTF by weight (17 out of 51 applications reviewed used products containing at least 50% PCBTF by weight)
 - The existing permit includes conditions that limit daily VOC and annual ethyl benzene emissions from this equipment

Autobody Spray Booth Example (Continued)

- An updated risk assessment was conducted that included PCBTF emissions
 - Results showed large increase in cancer risk
 - Coating containing 50% PCBTF by weight would need to reduce usage rate by over 95% to comply with the risk limits in Rule 1401
- In this example, a hypothetical future autobody spray booth permit application could be subject to permit conditions that would greatly limit product use unless an alternative product was available
 - Alternative products may have higher VOC content above limits currently allowed by South Coast AQMD rules

Regulatory Impact Summary

Compounds estimated to have minimal regulatory impacts

- 1-bromopropane
- Trivalent chromium
- Monomeric HDI
- Trimethylbenzene
- Cobalt

Compounds estimated to have significant impacts

- PCBTF
- TBAC

More information is needed

- Polymeric HDI

Limitations of Evaluation

- Limitations of preliminary evaluation
 - Permit evaluations were conducted on applications from 2018 to 2023
 - Products may be reformulated
 - May have no SDS available or outdated SDS
 - Evaluated only a subset of applications
 - It is not certain how many future applications will be submitted

Stakeholder Input Requested

1. Are there any other equipment or processes that are sources of proposed Table I toxic air contaminants and where further evaluation is needed?
2. Is there any other source where significant regulatory impact is anticipated?



Recent and Future Rule Developments

Background

- Control of VOC emissions plays a critical role in reducing ground level ozone, as well as particulate matter caused by the formation of secondary organic aerosols
- South Coast AQMD rules have established VOC content limits for a variety of products used on various substrates (e.g., wood) or industry (e.g., aerospace)
- Manufacturers have reformulated products to meet VOC limits
 - In some cases, this reformulation has involved use of solvents with lower reactivity, including PCBTF or TBAC
- OEHHA recently established toxic endpoints for PCBTF and TBAC
- South Coast AQMD Governing Board has identified the priority to reduce toxic emissions, even if this approach results in higher VOC emissions

Recent and Current Developments

Rule 1168 – Adhesive and Sealant Applications amended in 2022

- Established a path to phase out the use PCBTF and TBAC and adjusted VOC limits to allow time for reformulation

Proposed Amended Rule 1151 - Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations – Working Group Meeting initiated in 2023

- Ongoing effort to transition away from toxics and allow higher-VOC coatings with future lower VOC limits, and prohibition of PCBTF and TBAC

Proposed Amended Rule 1171 - Solvent Cleaning Operations – Working Group Meetings initiated January 2024

- Ongoing effort to identify alternative solvents and phase out PCBTF and TBAC
- So far, there are sufficient cleaning alternatives to replace without higher VOC limits

Future Actions

- To reduce levels of toxic air contaminants in sources identified from the PAR 1401 preliminary analysis and to address the regulatory impacts for permitting new, modified, or relocated equipment, rule development proposed for various VOC rules prioritizing emission sources subject to permitting
- A joint working group meeting for the following rules is scheduled for July 9, 2024 at 1PM*:
 - Rule 1107 - Coating of Metal Parts and Products
 - Rule 1124 - Aerospace Assembly and Component Manufacturing Operations
 - Rule 1136 - Wood Products Coatings

*<https://scaqmd.zoom.us/j/95678446098>

Recommended Actions

PAR 1401

- Continue to obtain feedback from industry representatives and stakeholders
- Pause on rule development

VOC Rules

- Prioritize rule development of VOC Rules to address toxic air contaminants and reduce emissions from existing and new sources, allowing for greater protection of public health
- Provide facilities alternatives/pathways to stay below health risk thresholds

Next Steps

Continue to obtain feedback from industry representatives and stakeholders



Stationary Source Committee tentatively scheduled in August



Refine regulatory impact assessment

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