

Proposed Amended Rule 1401

Working Group Meeting #2
July 6, 2017

Background



- Rule 1401 was amended in June 2015 to reference the 2015 OEHHA Guidelines for calculating health risk (SCAQMD Risk Assessment Procedures 8.0)
- 2015 amendments to Rule 1401 included provisions to allow spray booths and gasoline dispensing facilities to:
 - Continue using the SCAQMD Risk Assessment Procedures for Rules 1401 and 212 (Version 7.0)
 - Give staff more time to understand potential permitting impacts
- Adopted resolution committed staff to return to the Governing Board with specific proposed regulatory requirements and/or procedures

Recap of Working Group #1

Summary of Spray Booth Review



Area of Analysis	Number of Permits	Will T-BACT or Upgrades to T-BACT be Needed?
Total number of spray booths reviewed (2009-2014)	327	
Spray booths without T-BACT* where the cancer risk with 2015 OEHHA Guidelines would be:		
• ≤ 1 in one million after initial review	237	
• ≤ 1 in one million after in-depth review		
○ Use of materials with toxic air contaminants	10	No
○ Actual material usage	16	No
○ Toxic air contaminant content in Safety Data Sheet	10	No
○ No longer in operation	4	N/A
Spray booths with T-BACT where the cancer risk with 2015 OEHHA Guidelines would be:		
• ≤ 10 in one million	48	No
• >10 in one million	2	Yes

* T-BACT is Toxics Best Available Control Technology

Finding: Only 1% of all spray booth permits reviewed need to upgrade controls from HEPA to ULPA to remain under 10 in one million

Comments Received regarding Working Group #1



- Comment: Explain difference between CARB's and SCAQMD's proposed emission factors for refueling
 - Response: Presentation today provides more details regarding gasoline dispensing facility emission factors
- Comment: Provide details on impacts to gasoline dispensing facilities conducting Tier 4 analysis
 - Response: Presentation today provides more details
- Comment: Concerns with inclusion of criteria air pollutants (ozone, carbon monoxide & nitrogen dioxide) in Table 1
 - Response: Not including ozone, carbon monoxide, or nitrogen dioxide acute risk assessment health values in Table 1 in Rule 1401
 - Presentation today provides more details regarding updates to Table 1 in Rule 1401

Additional Comments from WSPA



- Availability of Proposed Risk Assessment Procedures
 - Version 8.1 will be available by August 2
 - Gas station appendix will be available in mid July
- CARB and CAPCOA are working on Industrywide Risk Assessment for gasoline dispensing facilities for AB2588
 - Separate from permitting gasoline dispensing facilities under Rule 1401
 - SCAQMD is participating in Industrywide Risk Assessment for gasoline dispensing facilities
- Explain difference between CARB's and SCAQMD's proposed emission factors for refueling
 - Presentation today provides more details regarding gasoline dispensing facility emission factors
- Concerns over abbreviated rule development schedule
 - If concerns remain after the public workshop, schedule will be discussed at Stationary Source Committee (July 21, 2017)

Overview of Today's Meeting



- Staff analysis and recommendation for Phase II refueling emission factor
- Assessment of using revised emission factors and OEHHA guidelines with current air dispersion modeling for gasoline dispensing facilities representing Proposed SCAQMD Risk Assessment Procedures (Version 8.1)*
- Analysis of toxic air contaminants that have been modified or added by OEHHA and recognized in Table 1 of Rule 1401

* 2015 OEHHA Guidelines, revised emission factors, and current modeling and meteorology

Phase II Refueling Emission Factor

Background on CARB Gasoline Dispensing Emission Factors



- CARB released revised gasoline dispensing emission factors in 2013
- Previous emission factors were finalized in late 1990's
- SCAQMD staff has been discussing the refueling emission factor with CARB since 2013
- CARB has agreed to revisit the refueling and spillage emission factors

Phase II Controlling Non-Onboard Refueling Vehicle Recovery (ORVR) Vehicles



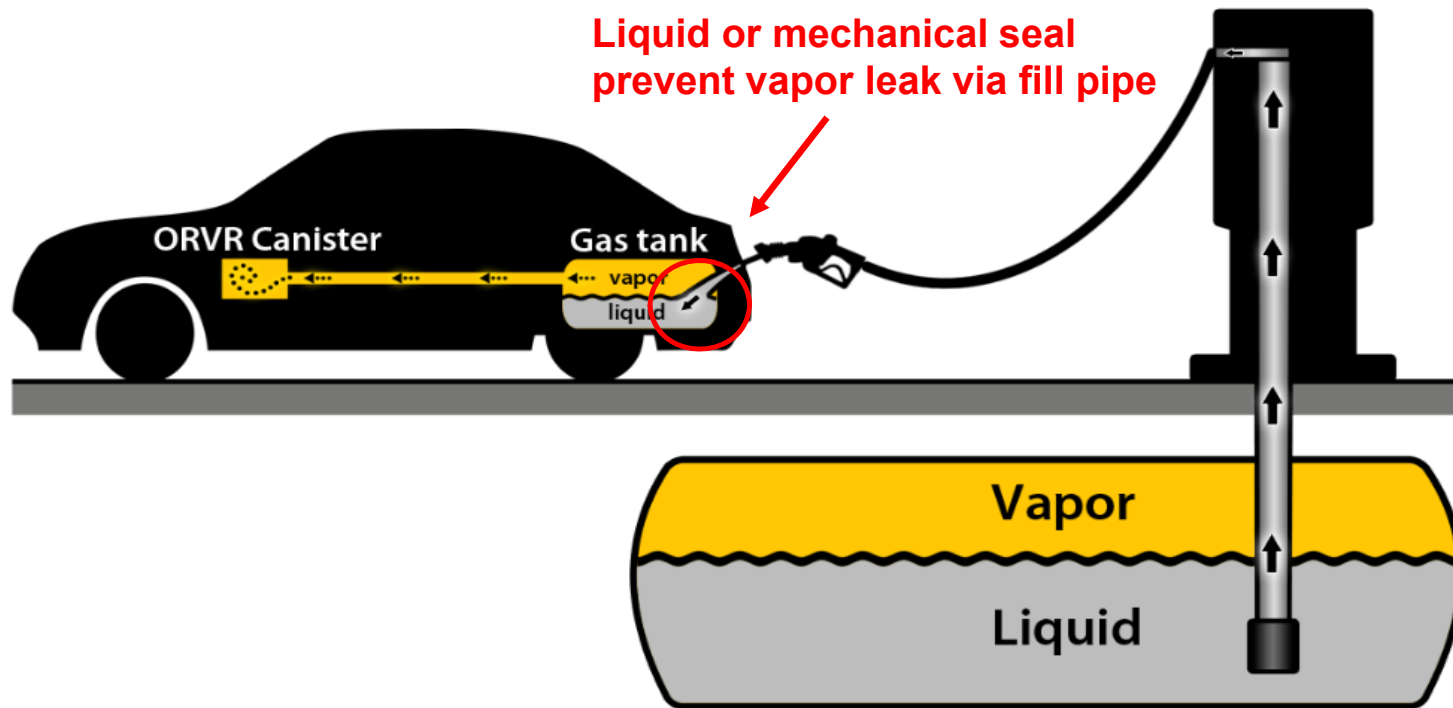
Phase II Control for Non-ORVR Vehicle



- Uncontrolled refueling emissions result from displacement of vapor within vehicle fuel tank
- Uncontrolled emissions = 8.4 lbs/kgal
- Displaced vapor has only one point of release – the vehicle refueling pipe
- Phase II EVR is to direct displaced vapor back to underground storage tank

Onboard Refueling Vapor Recovery (ORVR)

Onboard refueling vapor recovery systems capture displaced vapors



With Onboard Refueling Vapor Recovery (ORVR) systems, motor vehicles capture gasoline vapors displaced during refueling

Phase II Control for ORVR Vehicle

- Uncontrolled refueling emissions result from displacement of vapor within vehicle fuel tank
- Uncontrolled emissions = 8.4 lbs/kgal
- Displaced vapor in ORVR vehicle has two separate points of release – carbon canister OR vehicle refueling pipe

Comparison of Control Efficiencies



- Phase II Enhanced Vapor Recovery (EVR) = 95%
 - Capture vapor at vehicle fill pipe and return to Underground Storage Tank
- ORVR efficiency = 95%
 - Redirect vapor away from fill pipe and to onboard carbon canister
- ARB Proposed Emission Factors suggest controlled emissions from a vehicle's ORVR system are captured and controlled by Phase II EVR system with an additional 95% efficiency

Phase II EVR Emission Factor



- Control at the interface of nozzle and vehicle fuel fill pipe
- Uncontrolled Emission Factor (UEF) = 8.4 lbs/kgal
- Phase II EVR Efficiency = 95%
- Phase II EVR Emission Factor
 $= 8.4 \times (1 - 95\%)$
 $= 0.42 \text{ lbs/kgal}$

Phase I and Phase II vapor recovery systems predating enhanced vapor recovery (Pre-EVR); and enhanced Phase I and Phase II vapor recovery systems (EVR).

Table I-I
Current and Revised TOG Emission Factors for Gasoline Dispensing Facilities

Sub Category	Current ^a (lbs/kgal) ^b		Revised (lbs/kgal) ^b		
	UEF	Pre-EVR	UEF	Pre-EVR	EVR
Phase II Fueling					
Non-ORVR Vehicles	8.4	0.74	8.4	2.4	0.42
ORVR Vehicles	NA	NA	0.42	0.12	0.021
Phase I Bulk Transfer Losses	8.4	0.42	7.7	0.38	0.15
Pressure Driven Losses	0.84	0.1	0.76	0.092	0.024
Phase II Fueling - Spillage	0.64	0.42	0.61	0.42	0.24
Gasoline Dispensing Hose Permeation					
Year 2013	NA	NA	0.062	0.062	0.062
Year 2017	NA	NA	0.009	0.009	0.009

Notes:

- a - Current emission factors adopted May 1999, and predate EVR.
b - Pounds TOG emitted per thousand gallons dispensed or transferred.
UEF - Uncontrolled emission factor. No Phase I vapor recovery system for bulk transfer emissions, no Phase II vapor recovery system for all other subcategories.
Pre-EVR - Phase I pre-EVR system for bulk transfer emissions, Phase II pre-EVR system for all other subcategories.
EVR - Phase I EVR system for bulk transfer emissions, Phase II EVR system for all other subcategories.
NA - No current applicable emission factor.

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ORVR Emission Factor As Proposed by CARB



- Uncontrolled Emission Factor (UEF)
= 0.42 lbs/kgal (Phase II EVR EF)
- ORVR Efficiency = 95%
(i.e. 5% loss from carbon canister)
- UEF * ORVR Efficiency * Phase II EVR Efficiency
= $8.4 \times (1-0.95) \times (1-0.95)$
= $8.4 \times 0.05 \times 0.05$
= 0.42×0.05
= 0.021 lbs/kgal

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SCAQMD Assessment



- Uncontrolled Emission Factor for ORVR vehicle should be the same as non-ORVR vehicle = 8.4 lbs/kgal*
- Vapor displaced from ORVR fuel tank can be either controlled by carbon canister OR Phase II EVR, but not both
- CARB's ORVR vehicle emission factor of 0.021 lbs/kgal double counts emission reductions as if vapor can be controlled by both ORVR and Phase II EVR
- Controlled emission factor for ORVR vehicle and Phase II EVR should be:

$$8.4 \times (1 - 95\%) = 0.42 \text{ lbs/kgal}$$

Phase I and Phase II vapor recovery systems predating enhanced vapor recovery (Pre-EVR); and enhanced Phase I and Phase II vapor recovery systems (EVR).

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* ARB was notified of this discrepancy after the posting of the new set of EVR emission factors

Potential Impacts of 2015 OEHHA Guidelines for New and Modified Gasoline Dispensing Facilities

Background for Further Analysis of Gasoline Dispensing Facilities



- In March 2015, SCAQMD staff received new information from CARB regarding speciation profiles for gasoline dispensing facilities
- Additional time needed to assess permitting impacts with CARB emission factors and speciation profiles with the 2015 OEHHA Guidelines
- The following analysis assesses permitting impacts on gasoline dispensing facilities when accounting for:
 - Proposed gasoline dispensing emission factors and speciation profiles
 - 2015 OEHHA Guidelines
 - Current air dispersion modeling and updated meteorological data
- Approximately 3,300 gasoline dispensing facilities

SCAQMD Risk Assessment Approach for Gasoline Dispensing Facilities



- Gasoline dispensing facilities are evaluated as a “facility” under Rule 1401
- All sources at gasoline dispensing facilities are equipped with Toxics-Best Available Technology (T-BACT)
 - Rule 1401 allows 10 in-a-million cancer risk for sources meeting T-BACT
- When permitting gasoline dispensing facilities, either a Tier 2 Risk Screening Risk Assessment or a Tier 4 Detailed Risk Assessment is conducted
 - Overwhelming majority of facilities are permitted using the Tier 2 Risk Screening (as presented in following slides)
 - Tier 4 analysis normally occurs at initial application submittal or after requested throughput denied during Tier 2 analysis
 - Facility-specific information used for a Tier 4 provides maximum allowable throughput compared to Tier 2 analysis that uses more conservative assumptions in lieu of facility-specific information

Updates of SCAQMD Risk Assessment Procedures for Rules 1401 and 212



	SCAQMD Risk Assessment Procedures Version 7.0 (for all permit applications deemed complete after July 1, 2005)	SCAQMD Risk Assessment Procedures Version 8.0 (for all permit applications deemed complete after July 5, 2015 except spray booths and gasoline dispensing facilities)	Proposed SCAQMD Risk Assessment Procedures Version 8.1 (proposed for all permit applications deemed complete after October 1, 2017)
Risk Assessment Guidelines	2003 OEHHA Guidelines	2015 OEHHA Guidelines	2015 OEHHA Guidelines
Emission Factor and Speciation Profile	Current emission factors and speciation profiles	Current emission factors and speciation profiles	Updated emission factors and gasoline speciation profile*
Dispersion Modeling	ISCST3 (Industrial Source Complex-Short Term, Version 3)	AERMOD	AERMOD and updated meteorological data

* 2013 CARB emission factors and speciation profiles, with the exception of refueling emission factors for ORVR

Methodology



- Analysis assesses new and modified permits to have an understanding of potential impacts with SCAQMD Risk Assessment Procedures for Rules 1401 and 212 (Version 8.1):
 - 2015 OEHHA Guidelines
 - Updated emission factors for gasoline dispensing facilities and gasoline speciation profiles
 - AERMOD and updated meteorological data
- Analysis compares impacts between SCAQMD Risk Assessment Procedures Version 7.0 and 8.1
- For new permits issued:
 - 140 new permits issued between 2009 and 2016
 - All 140 new permits were analyzed
- For modified permits issued:
 - 1,200 modified permits were issued between 2009 and 2014
 - 300 of the 1,200 modified permits were analyzed

New Gasoline Dispensing Facilities



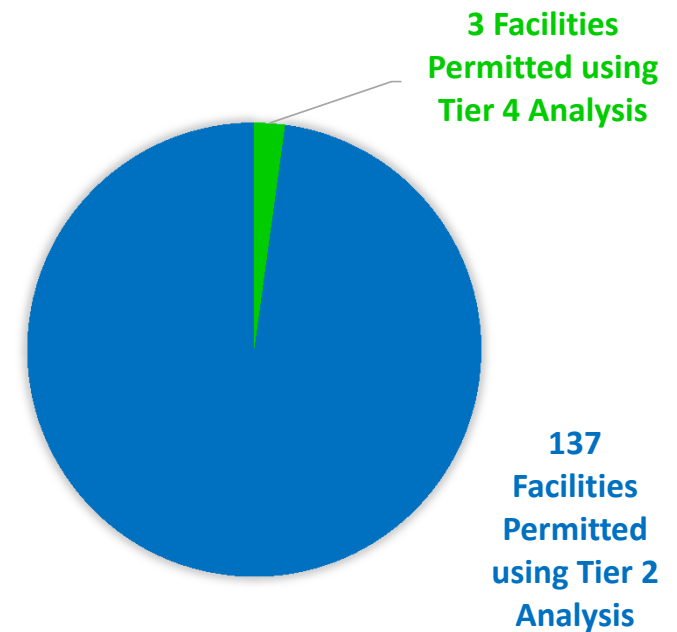
- Reviewed 140 new permits issued between 2009 and 2016 to predict potential impacts

Annual Throughput (MMGals/year)	Number of Gasoline Dispensing Facilities	Industry Type
<1	90	Aboveground storage tanks, mobile fuelers, and others
1-3	9	Aboveground storage tanks and gasoline dispensing facilities
>3	41	Retail gasoline dispensing facilities

Potential Impacts on New Permits for Gasoline Dispensing Facilities



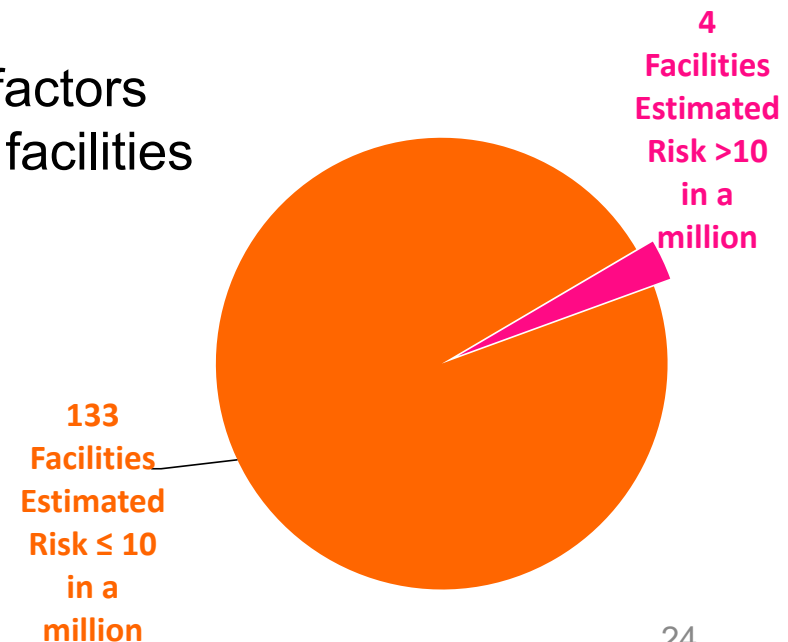
- Out of 140 new permits issued between 2009-2016
 - 137 facilities used Tier 2 screening
 - 3 facilities used Tier 4 dispersion modeling analysis to demonstrate compliance with Rule 1401 at the requested throughput
- Throughput: 5-17 million gallons per year
- Receptor distance: 18-226 meters



Analysis of New Gasoline Dispensing Facilities Using Tier 2 Analysis



- Analysis approach to estimate revised cancer risk
 - Used Tier 2 screening tool, with appropriate met station, receptor distance, and permitted throughput (Proposed SCAQMD Risk Assessment Procedures (Version 8.1))
 - Screening tool incorporated revised emission factors
- Result for the 137 permitted gasoline dispensing facilities that used a Tier 2 analysis
 - 133 gasoline dispensing facilities had an estimated health risk ≤ 10 in a million
 - 4 gasoline dispensing facilities had an estimated cancer risk > 10 in a million
 - Throughput: 5-8 million gallons per year
 - Receptor distance: ~35-45 meters



Analysis of New Gasoline Dispensing Facilities Using Tier 4 Analysis



- To estimate revised Tier 4 analysis impacts
 - Applied percentage increase/decrease based on location and distance to receptor
 - Percentage increase/decrease was based on a comparison of Version 7.0 and Version 8.1 Tier 2 screening tables
- Results for the 3 gasoline dispensing facilities that used Tier 4 dispersion modeling
 - Estimated health risk for the 3 gasoline dispensing facilities is expected to decrease

Summary of Potential Impacts of New Gasoline Dispensing Facilities



- Analysis indicates that ~ 2 percent of new permitted gasoline dispensing facilities that previously were permitted using a Tier 2 analysis may proceed with a Tier 4 analysis
 - Very likely that previously requested throughput would be found acceptable
 - Other options include:
 - Lowering the requested throughput; or
 - Orienting emission sources further away from receptor
- No impacts expected for new permitted gasoline dispensing facilities that are using a Tier 4 analysis

Types of Permit Modifications for Gasoline Dispensing Facility

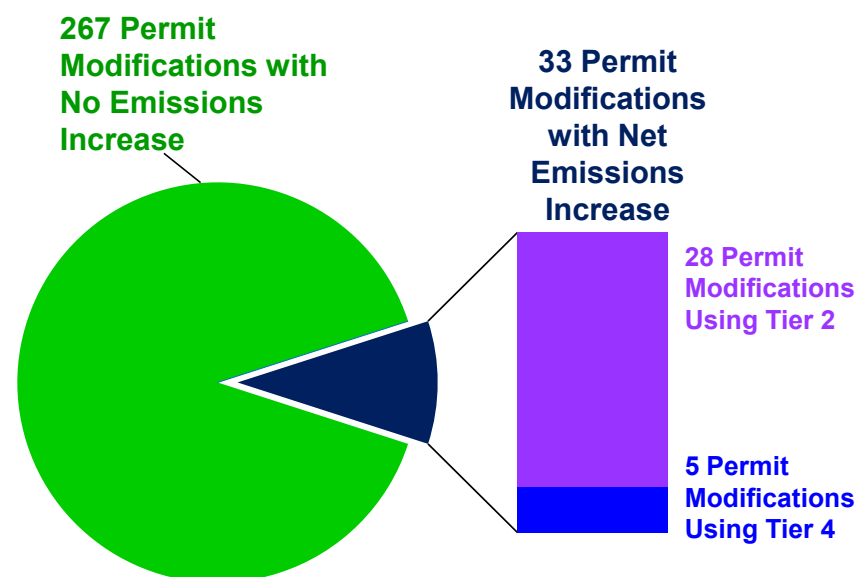


- Permit modifications with an emission increase will trigger Rule 1401
 - Total throughput at the gasoline dispensing facility is evaluated for modified permits that have an incremental throughput increase
- Permit modifications with no emission increase will not trigger Rule 1401 such as:
 - Replacement of existing vapor recovery system, nozzles, underground storage tanks
 - Conversion of an existing gasoline tank to diesel
 - Installation of underground fuel additive storage tanks
- Approximately 1,200 permits for modifications/alterations issued between 2009 and 2014 reviewed 300 permits
 - Sample size with 95% confidence level +/- 5% error
 - Random sampling
- Analysis focused on 300 permits

Analysis of Permit Modifications for Gasoline Dispensing Facilities



- Of the 300 permits for existing gasoline dispensing facilities filing for a permit for modifications/alterations between 2009 and 2014
 - 267 (~90%) modifications were associated with no emission increase and would not trigger Rule 1401
 - 33 (~10%) modifications were associated with an emission increase and triggered Rule 1401
- Of the 33 permit modifications that triggered Rule 1401:
 - 28 gasoline dispensing facilities used Tier 2 analysis
 - 5 gasoline dispensing facilities used Tier 4 analysis
- Approach used to analyze modified permits was the same for new permitted gasoline dispensing facilities



Results of Permit Modifications for Gasoline Dispensing Facilities



- Results for the 28 modified permits for gasoline dispensing facilities that used Tier 2 screening analysis
 - All 28 gasoline dispensing facilities had an estimated health risk ≤ 10 in a million
- Results for the 5 modified permits for gasoline dispensing facilities that used Tier 4 dispersion modeling
 - 2 gasoline dispensing facilities would have an increase in the estimated health risk, but estimated health risk is ≤ 10 in a million
 - Estimated health risk for remaining 3 gasoline dispensing facilities is expected to decrease
- Based on evaluation of 300 modified permits for gasoline dispensing facilities, no impacts expected with Proposed SCAQMD Risk Assessment Procedures (Version 8.1)*

* 2015 OEHHA Guidelines, revised emission factors, and current modeling and meteorology

Sensitivity Analysis

Is using cancer risk adequately protective without analyzing non-cancer health risk

1. For a maximum cancer risk of 10 in one million, the acute and chronic Hazard Index are substantially less than the threshold of 1.0 (< 0.1)
2. Acute non-cancer risk might occur at receptors where cancer health risk is not evaluated, such as sidewalks
 - Using the worst meteorological station at a receptor distance of 25 meters, 32 million gallons per year of gasoline would generate an acute hazard index of 1.0
 - Carcinogenic health risk would reach its threshold at a much lower throughput

Summary of Potential Permitting Impacts for Gasoline Dispensing Facilities



Summary of Permitting Impacts for Gasoline Dispensing Facilities with Version 8.1 Proposed Risk Assessment Procedures*	New Facilities	Modified Facilities	Potential Impacts
Estimated cancer risk for Tier 2 Screening Table: <ul style="list-style-type: none"> Remain ≤ 10 in one million Increase to > 10 in one million 	133 (97%) 4 (3%)	28 (100%) 0 (0%)	No (98%) Yes (2%)
Estimated cancer risk for Tier 4 Dispersion Modeling that Remain ≤ 10 in one million	3	5	No (100%)

Based on a review of 173 new or modified permits for gasoline dispensing facilities, ~2% of new gasoline dispensing facilities could be affected by Proposed SCAQMD Risk Assessment Procedures (Version 8.1)*

- It is expected that a Tier 4 analysis would allow these new gasoline dispensing facility to permit at the requested throughput
- Other options is facility can accept a lower throughput if a Tier 4 analysis is not conducted or if Tier 4 analysis is > 10 in a million

* 2015 OEHHA Guidelines, revised emission factors, and current modeling and meteorology

Potential Impacts of Updating Table I of Rule 1401

Overview of Updates to Table 1 of Rule 1401



- OEHHA periodically adds toxic air contaminants and revises health values associated with toxic air contaminants
- SCAQMD relies on OEHHA's list of toxic air contaminants and health values
- Table I of Rule 1401 is being updated to reflect revisions by OEHHA
- SCAQMD staff has analyzed potential impacts from adding or revising these toxic air contaminants
- Analysis of toxic air contaminants were grouped based on:
 - New toxic air contaminants
 - Update to toxic air contaminant with added health risk value
 - Update to toxic air contaminant with for already regulated compounds

New Toxic Air Contaminants

Substance	Sources	Analysis	Impacts
Caprolactam	Permitted use mostly in resin manufacturing facilities	SCAQMD Rule 1141 – Control of Volatile Organic Compound Emissions from Resin Manufacturing require that volatile organic compound emissions, including caprolactam emissions, be reduced by 95%	Addition of acute and chronic health risk values are not expected to have any additional impacts on resin manufacturing operations
Carbonyl sulfide	<ul style="list-style-type: none"> Emitted from some refineries as an end product of sulfur combustion A potential grain fumigant replacing methyl bromide 	Sulfur emissions are regulated as criteria pollutants necessitating the use of control equipment	The inclusion of acute and chronic non-cancer health values for carbonyl sulfide are not expected to require additional pollution controls

Updating Rule 1401 - Table I

Compounds with Added Health Risk Values



- Already in Table I with cancer or chronic risk
- OEHHA developed an acute reference exposure level
- Cancer or chronic risk is generally orders of magnitude greater than the acute risk
- Typographical error corrected for methylene diphenyl diisocyanate

CAS #	ADDED HEALTH RISK VALUES
106-99-0	1,3-butadiene (acute)
101-68-8	Methylene diphenyl diisocyanate (acute)
584-84-9	toluene-2,4-diisocyanate (acute)
91-08-7	toluene-2,6-diisocyanate (acute)

Updating Rule 1401 Table I Already Regulated Compounds



- Compounds added for clarification, no impact

CAS #	SUBSTANCE TO BE ADDED	RELATED SUBSTANCE
75-35-4	Dichloroethylene, 1,1-	Already listed as vinylidene chloride
1101	fluorides	hydrogen fluoride
319-85-6	hexachlorocyclohexane, alpha	hexachlorocyclohexane (mixed or technical grade)
319-85-7	hexachlorocyclohexane, beta	hexachlorocyclohexane (mixed or technical grade)
10294-40-3	barium chromate	hexavalent chromium
13765-19-0	calcium chromate	hexavalent chromium
1333-82-0	chromic trioxide	hexavalent chromium
10588-01-9	sodium dichromate	hexavalent chromium
7789-06-2	strontium chromate	hexavalent chromium
13530-65-9	zinc chromate	hexavalent chromium
7440-62-2	vanadium (fume or dust)	vanadium pentoxide



Reference Documents for Risk Assessment Procedures

- SCAQMD Risk Assessment Procedures (Version 8.1) will include facilities for spray booths and gasoline dispensing facilities
- Attachment N updated with new values

Schedule

- Jun 1, 2017 Working Group # 1
- Jul 6, 2017 Working Group # 2
- Jul 7, 2017 Set Hearing
- Jul 12, 2017 Public Workshop
- Jul 21, 2107 Stationary Source Committee
- Sep 1, 2017 Public Hearing

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