SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Preliminary Draft Staff Report

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

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BACKGROUND

Rule 1401 – New Source Review of Toxic Air Contaminants (Rule 1401) was adopted in June 1990 and establishes health risk thresholds for new or modified permitted equipment or processes. Under Rule 1401, the health risk assessment conducted for new or modified permit units must not exceed a maximum individual cancer risk of one in one million, a cancer burden of 0.5, a chronic hazard index of one, and an acute hazard index of one. The methodology used to estimate health risks for SCAQMD's toxic regulatory program, including Rule 1401, is based on guidance from the Office of Environmental Human Health Assessment (OEHHA). OEHHA's Risk Assessment Guidelines are incorporated in the South Coast Air Quality Management District's (SCAQMD) Risk Assessment Procedures for Rules 1401, 1401.1 and 212.

In March 2015, OEHHA revised its Risk Assessment Guidelines[1] (2015 OEHHA Guidelines) to incorporate requirements from the Children's Health Protection Act of 1999 (SB 25) which included the addition of child specific factors that increased the estimated cancer risk for long-term exposures for residential and sensitive receptors. The result is an increase in the estimated cancer risk of about 2.3 times, and higher for certain toxic air contaminants that have multiple exposure pathways such as inhalation, ingestion, and dermal. The 2015 OEHHA Guidelines do not change the toxic emission reductions already achieved by facilities in the South Coast Air Basin (Basin). The 2015 OEHHA Guidelines represent a change in the methodologies and calculations used to estimate health risk based on the most recent scientific data on exposure, childhood sensitivity, and breathing rates.

At the June 5, 2015 meeting, the SCAQMD Governing Board adopted amendments to Rule 1401 and incorporated the 2015 OEHHA Guidelines into SCAQMD's Risk Assessment Procedures (Version 8.0)[2]. SCAQMD staff evaluated permits received between October 1, 2009 and October 1, 2014 and found that some spray booths may have difficulties meeting the Rule 1401 risk thresholds using the 2015 OEHHA Guidelines. In addition, time was also needed to better assess and understand the impacts from gasoline dispensing facilities before use of the 2015 OEHHA Guidelines. Therefore, provisions were included in the June 2015 amendment to Rule 1401[3] to allow spray booths and retail gasoline transfer and dispensing facilities to continue to use the then current SCAQMD Risk Assessment Procedures (Version 7.0)[4] to calculate the cancer risk until SCAQMD staff returns to the Board with specific regulations and/or procedures for these industries.

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[1] Available on the internet at https://oehha.ca.gov/air/crnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0

[2] SCAQMD's Risk Assessment Procedures for Rules 1401 and 212 (Version 8.0) can be found here: http://www.aqmd.gov/docs/default-source/planning/risk-assessment/riskassprocjune15.pdf and Attachment M can be found here: http://www.aqmd.gov/docs/default-source/permitting/attachment-m.pdf.

[3] SCAQMD's June 2015 Staff Report for Proposed Amended Rules 212 – Standards for Approving Permits and Issuing Public Notice, 1401 – New Source Review of Toxic Air Contaminants, 1401.1 – Requirements for New and Relocated Facilities Near Schools, and 1402 – Control of Toxic Air Contaminants from Existing Sources," can be found here: http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2015/2015-jun1-028.pdf?sfvrsn=9

[4] SCAQMD's Risk Assessment Procedures for Rules 1401, 1401.1 and 212 (Version 7.0) can be found here: http://www.aqmd.gov/docs/default-source/planning/risk-assessment/risk-assessment-procedures-v-7.pdf and Attachment L can be found here: http://www.aqmd.gov/docs/default-source/planning/risk-assessment/attachment-l.pdf.

Staff has since completed the review of spray booths and gasoline dispensing facilities. The results of the analysis is presented below under the section Proposed Amendments to Rule 1401. As discussed later in this staff report, implementation of the 2015 OEHHA Guidelines are expected to have minimal impacts to new or modified spray booth or retail gasoline dispensing permits. Proposed Amended Rule 1401 is proposing to require these two source categories to begin using the SCAQMD's Risk Assessment Procedures (Version 8.1) which incorporates the 2015 OEHHA Guidelines.

PUBLIC PROCESS AND OUTREACH EFFORTS

Development of Proposed Amend Rule 1401 (PAR 1401) is being conducted through a public process. SCAQMD staff has held a working group meeting at SCAQMD Headquarters in Diamond Bar on June 1, 2017. A second working group meeting is scheduled for June 29, 2017. The Working Group is composed of representatives from businesses, environmental groups, public agencies, and consultants. The purposes of the working group meetings are to discuss proposed concepts and to work through the details of staff's proposal. In addition, a Public Workshop is scheduled for July 12, 2017.

PROPOSED AMENDMENTS TO RULE 1401

Currently, Rule 1401 allows the use of the previous SCAQMD Risk Assessment Procedures (Version 7.0) when determining risk for new and modified spray booths (e)(3)(A) and gasoline dispensing facilities (e)(3)(B). PAR 1401 will remove those provisions and instead require the use of the proposed SCAQMD Risk Assessment Procedures (Version 8.1) for all new and modified permitted equipment and processes. SCAQMD Risk Assessment Procedures Version 8.1 will replace Version 8.0 to reflect updates of emission factors, speciation profiles and dispersion modeling. Additionally, PAR 1401 will update the list of toxic air contaminants subject to the rule.

Spray Booths

Staff evaluated spray booth permits issued from October 1, 2009 through October 1, 2014. Over the five-year permitting period, SCAQMD staff processed approximately 1,400 new or modified permits for spray booths. Out of the 1,400 spray booth permits, staff conducted a detailed review of a subset of 327 permits. This sample size was selected to provide a 95 percent confidence level and a 5 percent margin of error in the analysis. The objectives of the analysis were to identify under the 2015 OEHHA Guidelines if: (1) spray booths that were not required to install pollution controls could potentially need to install pollution controls; or (2) spray booths that were required to install pollution controls could potentially need to upgrade pollution controls. Staff reviewed permit applications to better understand:

- Industry type and applicable coating rule(s);
- Chemical(s) driving the carcinogenic risk; and
- Maximum individual cancer risk

Out of the 327 permits reviewed, automotive finishing accounted for almost one third of the applications. Wood coatings and other coatings each contributed to 23% of the applications, followed by metal coatings and aerospace coatings. Overall, the distribution of the industry type was very similar between the subset of reviewed permits and all the spray booth permits issued over the five-year period, indicating that the universe of spray booth application was well represented by the subset sample as indicated by Figure 1 below.

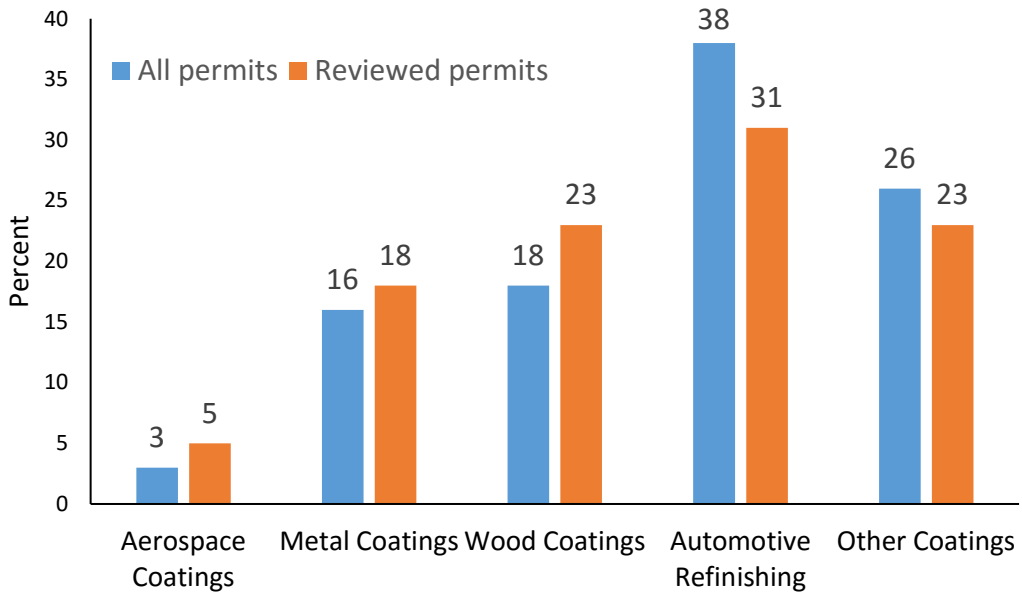

Figure 1: Industry Type Breakdown of Spray Booth Permit Applications

All spray booths are permitted with the maximum individual cancer risk below the Rule 1401 risk thresholds of either 1 in-one-million without Best Available Control Technology for Toxics (T-BACT), or 10 in one million with T-BACT. To determine if the 2015 OEHHA Guidelines would impact the spray booths, the maximum individual cancer risk calculated in the permit evaluation was multiplied by three if the materials driving cancer risk had no multipathway factor (including most volatile organic compounds) or multiplied by six if the material driving cancer risk had a multipathway factor (including most toxic metals).

Applying the 2015 OEHHA Guidelines, 285 out of the 327 spray booths reviewed (87%), are not expected to be impacted because the maximum individual cancer risk remained below Rule 1401 thresholds. The remaining 42 spray booths (13%) may potentially have impacts as the risk threshold is exceeded when the 2015 OEHHA Guidelines adjustment factor was applied to estimate the maximum individual cancer risk. This includes 40 permit applications for spray booths without T-BACT, and 2 permit applications for spray booths with T-BACT. Figure 2 provides an overview of the potential impacts of the 2015 OEHHA Guidelines on spray booths, based on the detailed review of the 327 spray booth permits.

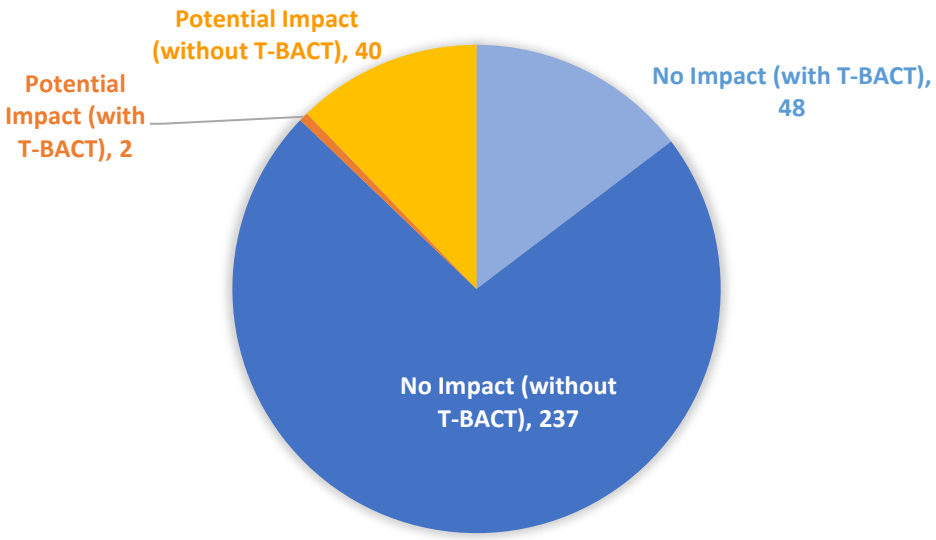

Figure 2: Potential Impacts of 2015 OEHHA Guidelines on Spray Booths

Impacts on Spray Booth Applications with T-BACT

Of the 327 permits reviewed, 50 were permitted with T-BACT including 48 with an estimated cancer risk that remained below the threshold of 10 in one million with the application of the 2015 OEHHA Guidelines. Among these spray booths, most of them use coatings containing hexavalent chromium or other metals. Thus, if these 48 spray booths were permitted using the proposed SCAQMD Risk Assessment Procedures (Version 8.1) that incorporates the 2015 OEHHA Guidelines, no additional pollution controls are expected.

Two spray booths had an estimated cancer risk above 10 in one million with the use of the 2015 OEHHA Guidelines. These two spray booths use aerospace coatings containing hexavalent chromium, and include the use of high efficiency particulate air (HEPA) filters with an efficiency of 99.999%, which is considered T-BACT. The facility-wide cancer risk is kept below 10 in a million with limits on the maximum allowable usage of hexavalent chromium and ethyl benzene. If these two spray booths were to apply for their permits using the proposed SCAQMD Risk Assessment Procedures (Version 8.1), the cancer risk would exceed the threshold of 10 in one million assuming the same throughput and emission control technology are used. Thus, a new spray booth application with the same operating conditions as these two spray booths would have to either reduce their throughput or use a more effective control technology. An ultra-low penetration air (ULPA) filter provides a removal efficiency of 99.99999%, and is commercially available with a comparable cost as the HEPA filter. Nonetheless, a filter with a higher efficiency will likely increase the pressure drop across the filter. Depending on the design of the air system, a stronger fan/blower might be needed to accommodate a more efficient filter.

Impacts on Spray Booth Applications without T-BACT

Of the 327 permits reviewed, 277 are permitted without T-BACT. Staff estimates that with the application of the 2015 OEHHA Guidelines the estimated cancer risk for 237 (86%) permitted spray booths would remain below a health risk of 1 in one million so no further action, such as the addition of pollution controls or changes to the type or amount of materials identified in the permit, would be expected. These types of permit applications would not be impacted by incorporating the 2015 OEHHA Guidelines in the proposed SCAQMD Risk Assessment Procedures (Version 8.1) because the coatings applied have low or no toxics content.

Of the 277 spray booths reviewed, 40 spray booths (14%) exceeded the cancer risk threshold of 1 in one million when the 2015 OEHHA Guidelines were applied. An in-depth analysis was conducted on the permits issued for these 40 spray booths to better understand the volume and the content of toxic air contaminants in the coatings used. Four spray booths were found to be no longer in service and are not included in the analysis below, leaving 36 permits for spray booths analyzed. Staff collected safety data sheets, usage records, contacted coating suppliers, or conducted site visits to examine the potential impact of the 2015 OEHHA Guidelines.

Among the 36 spray booths that are in operation, ethyl benzene was the most prevalent toxic air contaminant used in coatings with 72% of the permits for spray booths use coatings with ethyl benzene. Formaldehyde is the next most common toxic air contaminant used in coatings, representing 8% of the permits for spray booths. For the other permits, the formulations had multiple toxic air contaminants, including ethyl benzene and formaldehyde (8%), ethyl benzene and nickel (6%), as well as ethyl benzene and others (6%).

As discussed in more detail below, the 36 permits for spray booths are not expected to be impacted by the 2015 OEHHA Guidelines because the facilities are either no longer using toxic air contaminants, the actual usage of materials containing toxic air contaminants is much lower than permitted levels, or the amount of toxic air contaminants assumed in the permit is higher than the actual amount in the material used. The results of the in-depth analysis is illustrated in Figure 3 below.

Permitted Spray Booths Without T-BACT – Use of Materials With Toxic Air Contaminants

Based on interviews with owner or operators with permitted spray booths, staff found that for 10 of the 36 permits for spray booths, the owner or operator switched to coatings and are currently using coatings that do not contain toxic air containments. In some cases, the facility had opted to utilize a new coating while in the remaining cases, the coating had been reformulated. Reformulated coatings typically replace the mineral spirits that contains trace quantities of ethyl benzene with a hydrotreated petroleum distillate that performs the same function but does not contain ethyl benzene. Thus, it is expected that a considerable fraction of owners or operators that are applying for permits for spray booths will be selecting coatings that do not contain toxic air contaminants as coatings that do not contain toxic air contaminants are available. It is assumed that for the 10 permitted spray booths that originally were using coatings with toxic air contaminants, that in the future these permit applications would not be impacted by incorporating the 2015 OEHHA Guidelines in the proposed SCAQMD Risk Assessment Procedures (Version 8.1) because operators are already making the decision to use coatings that do not contain toxic air contaminants.

Permitted Spray Booths Without T-BACT – Actual Material Usage

Based on interviews and site visits with owner and operators, staff found that the permitted usage of coatings was considerably higher than the actual usage in 16 of 36 permits for spray booths reviewed (25%). In many cases, the facility is given a maximum allowable limit on the number of gallons for the overall use and a maximum allowable limit on the number of gallons that can be used that contain a toxic air contaminant. Because the spray booths use multiple coatings within the same booth and most coatings do not contain a toxic air contaminant, the facility may use close to their overall use limit but not approach their limit for coatings that contain toxic air contaminants. Because their actual usage is considerably lower than their maximum allowable usage limit for specific coatings with toxic air contaminants, a lower permitted usage will not impact their operations. By establishing maximum usage limits for coatings with toxic air contaminants that are closer to anticipated actual usage, it is expected that for the 16 permitted spray booths that in the future these permit applications would not be impacted by incorporating the 2015 OEHHA Guidelines in the proposed SCAQMD Risk Assessment Procedures (Version 8.1) because operators can accept a lower permitted usage limit for materials with toxic air contaminants.

Permitted Spray Booths Without T-BACT – Toxic Air Contaminant Content in Safety Data Sheet

Based on interviews with owner or operators and coating formulators, staff found that for 10 of the spray booths, the Safety Data Sheet had overstated the quantity of toxic air contaminants in their coatings. Safety Data Sheets list the range (in percent by weight) of toxic air contaminants present in the coating formulation. In many cases the formulated coating will list the ethyl benzene content as between 0.5 and 5 percent. However, based on discussions with the coating formulator, the actual ethyl benzene content for the formulated product is actually between 0.2 and 2.5 percent. If these spray booths were to apply for new permits under the proposed SCAQMD Risk Assessment Procedures (Version 8.1), they might consider migrating to reformulated coatings / new coatings with lower or no ethyl benzene content. Alternatively, manufacturers might update the Safety Data Sheet to provide a more accurate estimate with products using ethyl benzene. By either using a more accurate percentage of toxic air contaminant in the coating formulation or using a coating with lower or no ethyl benzene, it is expected that for the 10 permitted spray booths that in the future these permit applications would not be impacted by incorporating the 2015 OEHHA Guidelines in the proposed SCAQMD Risk Assessment Procedures (Version 8.1).

Summary of Spray Booth Analysis

Based on the detailed review of 327 spray booth permit applications, the implementation of the 2015 OEHHA Guidelines in the proposed SCAQMD Risk Assessment Procedures (Version 8.1) will result in no impact for 99% of spray booth permits. Figure 3 below summarizes staff's findings for spray booths that were permitted without T-BACT. For spray booths that were permitted without T-BACT, it is expected that in the future permit applicants will either select a coating with no toxic air contaminants, use products that provide more accurate estimates of toxic air contaminants in the Safety Data Sheet, or accept a lower usage limit rather than install T-BACT.

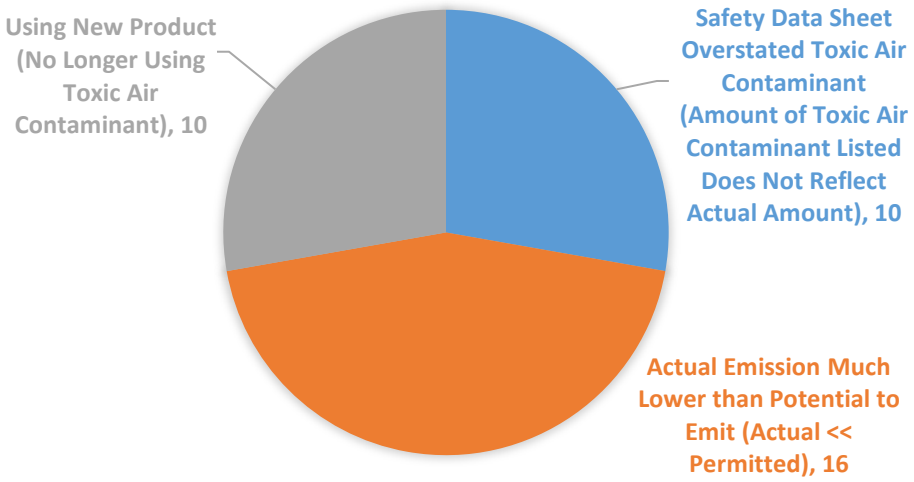

Figure 3: Summary Findings for 36 Spray Booths without T-BACT

Table 1 provides a summary findings for spray booths. Approximately 1% (two of the 327) of spray booth permits may need to use a high efficiency filter media such as ULPA filters, or consider reducing their throughput if the 2015 OEHHA Guidelines are utilized. For facilities that were permitted without T-BACT, it is expected that no additional pollution controls would be needed using the 2015 OEHHA Guidelines. Therefore, with a 95 percent confidence level, it is expected that approximately 1% of new spray booth permit applications will require additional pollution control equipment if the 2015 OEHHA Guidelines are utilized. With SCAQMD receiving, on average, 280 spray booth permit applications annually, approximately three booth permits annually could require higher level of air pollution controls. The expected additional air pollution control would be the replacement of HEPA filters with ULPA filters. It is concluded that the impact of the 2015 OEHHA Guidelines are minimal on spray booth applications, staff recommends to remove exemption and reference the proposed SCAQMD Risk Assessment Procedures (Version 8.1) for spray booths.

Table 1: Summary Findings for Spray Booths with T-BACT

Area of Analysis	Number of Permits	Will T-BACT or Upgrades to T-BACT be Needed?
Total number of spray booths reviewed	327	
Spray booths without T-BACT where the 2015 OEHHA Guidelines would be:		
• ≤ 1 in one million after initial review	237	
• ≤ 1 in one million after in-depth review		
o Use of materials with toxic air contaminants	10	No
o Actual material usage	16	No
o Toxic air contaminant content in Safety Data Sheet	10	No
o No longer in operation	4	N/A
Spray booths with T-BACT where the 2015 OEHHA Guidelines would be:		
• ≤ 10 in one million	48	No
• >10 in one million	2	Yes
Percent of spray booth permits that will need T-BACT or upgrades to T-BACT controls out of 327 permits reviewed	0.6%	

Gasoline Dispensing Facilities

In the amendments of Rule 1401 in June 2015, SCAQMD staff recommended that retail gasoline transfer and dispensing facilities continue to use the then current SCAQMD Risk Assessment Procedures (Version 7.0) because additional time was needed to better assess the potential impacts of the revised speciation profile that CARB had provided in March 2015 and emission data on gasoline dispensing facilities.

As part of this rule development process for PAR 1401, staff evaluated the potential impacts of the revised emission factors and gasoline speciation profiles and how they could affect new gasoline dispensing facilities combined with the use of the 2015 OEHHA Guidelines in proposed SCAQMD Risk Assessment Procedures (Version 8.1). The emission factors were revised for the processes of loading, breathing, refueling, and spillage, and new information was added for hose permeation. Each of the processes is briefly described below:

i) Loading - Emissions occur when a fuel tanker truck unloads gasoline to the storage tanks. The storage tank vapors, displaced during loading, are emitted through its vent pipe. A pressure/vacuum valve installed on the tank vent pipe significantly reduces these emissions.

ii) Breathing - Emissions occur through the storage tank vent pipe as a result of temperature and pressure changes in the tank vapor space.

iii) Refueling - Emissions occur during motor vehicle refueling when gasoline vapors escape through the vehicle/nozzle interface.

iv) Spillage - Emissions occur from evaporating gasoline that spills during vehicle refueling.

v) Hose Permeation - Emissions caused by the migration of liquid gasoline through the outer hose material and to the atmosphere through permeation.

Table 2 presents the current, CARB revised, and proposed controlled gasoline emission factors for the process of loading, breathing, refueling, spillage and hose permeation. The proposed controlled factors given in the Table 2 follow the CARB recommended guidelines except that a 95 percent control efficiency is assumed for Phase II vapor recovery for refueling of ORVR vehicles, whereas CARB assumes a 99.75 percent control efficiency.

Table 2: Current and Proposed Controlled Gasoline Emission Factor (lbs/1,000 gallon)

Process	Current Controlled Gasoline Emission Factor (lbs/1,000 gal)	CARB Revised Controlled Gasoline Emission Factor (lbs/1,000 gal)	SCAQMD Proposed Controlled Gasoline Emission Factor (lbs/1,000 gal)
Loading	0.42	0.15	0.15
Breathing	0.025	0.024	0.024
Refueling	0.32	0.42 for Non-ORVR Vehicles 0.021 for ORVR Vehicles	0.42
Spillage	0.24	0.24	0.24
Hose Permeation	None	0.009	0.009

In addition to emission factors, CARB has also developed speciation profiles of various toxic air contaminants. Out of the toxic compounds emitted from gasoline facilities, benzene, ethylbenzene, and naphthalene have cancer toxicity values. The speciation profiles are different for vapor and liquid phases of gasoline for benzene, ethyl benzene, and naphthalene. Table 3 presents the current and proposed speciation profile in weight percent for the three toxic air contaminants.

Table 3: Current and Proposed Weight Percent (lbs/1,000 gallon)

Toxic Air Contaminant	Current Weight Percent	Proposed Weight Percent
Benzene (vapor)	0.30%	0.46%
Ethyl benzene (vapor)	0.118%	0.11%
Naphthalene (vapor)	0%	0.00044%
Benzene (liquid)	1.00%	0.71%
Ethyl benzene (liquid)	1.64%	1.29%
Naphthalene (liquid)	0.14%	0.17%

In addition to incorporating the 2015 OEHHA Guidelines and CARB's emission factors, there have been updates to the dispersion model used. Under SCAQMD's Risk Assessment Procedures Version 7.0, the U.S. Environmental Protection Agency's (U.S. EPA) dispersion model ISCST3 (Industrial Source Complex – Short Term, Version 3) was incorporated in the Hotspots Analysis and Reporting Program (HARP) software for the health risk assessment. In the most recent version of HARP (HARP 2), the U.S. EPA dispersion model AERMOD is used to estimate the concentration of pollutants in place of the previously used ISCST3 model. In addition to the new dispersion model, the meteorological data used to estimate cancer risk has been updated. It is SCAQMD's policy to update the meteorological data used for dispersion modeling every three years. In previous years, the use of SCAQMD collected meteorological data was used exclusively. However, in the most recent update of meteorological data, it was discovered that the meteorological data at some SCAQMD sites did not meet the QA/QC criteria for dispersion modeling. Therefore, the SCAQMD meteorological sites were supplemented with Automated Surface Observing System (ASOS) sites. Designed to serve meteorological and aviation observing needs, ASOS sites are located at various airports in the Basin. ASOS data was retrieved from the National Centers for Environmental Information (https://www.ncei.noaa.gov/). Finally, the use of meteorological correction factors have been removed in favor of more precise dispersion factors provided for each meteorological station. Additional information about the updates of the meteorological modeling will be included in SCAQMD's Risk Assessment Procedures (Version 8.1).

The proposed SCAQMD Risk Assessment Procedures (Version 8.1) has been revised using the following updated items: (1) 2015 OEHHA Guidelines, (2) CARB emission factors and gasoline speciation profiles, and (3) dispersion modeling. To assess the impacts of these updates on gasoline dispensing facilities, staff evaluated gasoline dispensing facilities that applied for a new permit (i.e. permit to construct or permit to operate) from October 1, 2009 through December 31, 2016. Staff also looked at a subset of the applications (95% confidence level with 10% error) submitted by existing gasoline dispensing facilities for alterations/modifications and found that approximately 10% requested an increase throughput and therefore is subject to Rule 1401. Among the applications reviewed, none of the alterations/modifications permit applications exceeded the threshold when using SCAQMD Risk Assessment Procedures Version 7.0 or Version 8.1, and thus no impact is expected.

Over the seven-year period, 140 new permits of gasoline dispensing facilities were processed. To identify gasoline dispensing facilities that would exceed the maximum individual cancer risk of ten in one million as they are equipped with T-BACT, staff gathered the following data from the permit applications:

- Industry type and application type (new, modified, relocated);
- Permitted throughput, usually expressed as million gallons per year;
- Distance to the nearest residential and commercial receptor;
- Location of the gasoline dispensing facilities; and
- Maximum individual cancer risk

Table 4 provides a summary of the permitted annual throughput for the gasoline dispensing facilities reviewed. Of the 140 new permits, the majority of the applications (64%) are permitted at less than 1 million gallons per year. They include aboveground storage tanks, mobile fuelers, as well as underground storage tanks serving commercial (non-retail) operations. Fifty gasoline

dispensing facilities were permitted at an annual throughput above 1 million gallons per year. Most of these high throughput facilities are retail service stations.

Table 4: Annual Throughput of Gasoline Dispensing Facilities Permitted between 2009 and 2016

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 retail gas stations
>3	41	Retail gas stations

Over the seven-year period from October 2009 to December 2016, three of the 140 new gasoline dispensing facilities had a maximum individual cancer risk above ten in one million based on Tier 2 screening and therefore, the applicant submitted a more refined site specific Tier 4 analysis (Detailed Risk Assessment) in order to demonstrate compliance with Rule 1401 at the requested throughput. Since those applicants already submitted a Tier 4 analysis under the SCAQMD Risk Assessment Procedures (Version 7.0), the use of the proposed SCAQMD Risk Assessment Procedures (Version 8.1) would likely not affect this permit application, insofar as a Tier 4 analysis would also need to be submitted.

The cancer risks for the rest of the applications (137 of 140) were determined using Tier 2 Screening Risk Assessment. In order to analyze the impacts to these permits from the use of the 2015 OEHHA Guidelines, staff used the screening tables (Tier 2) in the proposed SCAQMD Risk Assessment Procedures (Version 8.1) to estimate the cancer risk for the permits. Using the proposed SCAQMD Risk Assessment Procedures (Version 8.1), 132 of the 137 gasoline dispensing facilities had estimated cancer risks that remained below the Rule 1401 thresholds. Therefore, no impact is expected for 96% of permit applications, if these permits were to be processed with the proposed SCAQMD Risk Assessment Procedures (Version 8.1). Five of the 137 facilities had cancer risks that would exceed the threshold. The five facilities are retail service stations equipped with CARB certified Phase I and Phase II vapor controls, which are considered to be T-BACT. The five facilities are located in Whitter (Facility A), Burbank (Facility B), Riverside (Facility C), Perris (Facility D), and San Bernardino (Facility E), respectively. Table 5 summarizes the potential impacts of the proposed Risk Assessment Procedures. Note that for these five facilities, the allowable throughput was calculated based on Tier 2 Screening Risk Assessment as part of the permitting process. The permit applicants did not choose to proceed to a higher tier (Tier 3: Screening Dispersion Modeling or Tier 4: Detailed Risk Assessment) for a more refined risk assessment. If Facility A, B[5], C, D and E were to apply for a new permit under the proposed

[5] Note that this facility is located within 500 feet of a school and permitted prior to the adoption of Rule 1401.1 - Requirements for New and Relocated Facilities near Schools. Under SCAQMD Rule 1401.1, the maximum individual cancer risk shall not exceed one in one million at any school within 500 feet of the toxic-emitting permit unit at the facility. Therefore, if a facility was to apply for a new or modified SCAQMD permit where Facility B is

SCAQMD Risk Assessment Procedures (Version 8.1), their throughput would have decreased by 14%, 18%, 40%, 4% and 1%, respectively.

Table 5: Potential Impacts of the Proposed SCAQMD Risk Assessment Procedures (Version 8.1)

Facility	Maximum Individual Cancer Risk Estimated using Current SCAQMD Risk Assessment Procedures (Version 7.0) (per One Million)	Maximum Individual Cancer Risk Estimated using Proposed SCAQMD Risk Assessment Procedures (Version 8.1) (per One Million)
A	9.97	11.4
B	9.72	11.9
C	9.86	16.5
D	9.55	10.3
E	9.96	10.0

All retail service stations within SCAQMD's jurisdiction are already equipped with CARB certified Phase I and Phase II vapor recovery systems to control gasoline emissions. Phase I vapor recovery refers to the collection of gasoline vapors displaced from storage tanks when cargo tank trucks make gasoline deliveries. Phase II vapor recovery systems control the vapors displaced from the vehicle fuel tanks during refueling. In addition, all gasoline is stored underground with valves installed on the tank vent pipes to further control gasoline emissions. Installation of additional emission control technology is not economical and very unlikely.

On the other hand, cancer risks decrease substantially with distance. Estimated cancer risks are higher when the facility is close to the receptor. For one million gallon of gasoline, the residential maximum individual cancer risk ranges from 2.7 to 5.2 in one million at 25 meters from receptor, and decreases considerably to a range of 0.31 to 0.77 in one million at 100 meters from the receptor. Among the five facilities listed in Table 5, the highest cancer risk is observed at Facility C. Using Facility C as the worst case scenario, the cancer risk calculated using the proposed SCAQMD Risk Assessment Procedures (Version 8.1) would remain below the threshold for the same throughput as previously permitted, if the distance between the emission source and the nearest downwind receptor was 55 meters instead of 41 meters. Thus, retail gasoline dispensing facilities that would like to be permitted with a relatively high throughput might need to give more consideration to its site design by positioning the emission source further away from the sensitive receptor.

Furthermore, while the use of Tier 1 and Tier 2 screening tables are useful to allow most facilities to demonstrate compliance with Rule 1401 without complicated dispersion modeling, there are other more refined modeling options available to applicants such as the use of Tier 3 and Tier 4

located, it would be subject to Rule 1401.1. The maximum individual cancer risk will be limited to less than one in one million at the school, and the permitted throughput will be substantially lower.

analyses. As previously discussed, three of the 140 new applicants demonstrated compliance through Tier 4 modeling. If the Tier 2 screening risk assessment results in a risk estimate that exceeds the risk limits or the permit applicant feels that a more detailed evaluation would result in a lower risk estimate, the applicant has the option of conducting a more detailed analysis using Tier 3 or 4.

Summary of Analysis on Gasoline Dispensing Facilities

Based on the detailed review of 137 permit applications of gasoline dispensing facilities over the period from October 2009 to December 2016, the implementation of the proposed SCAQMD Risk Assessment Procedures (Version 8.1) will result in no impact for 96% of permit applications. Approximately four percent of permit applicants may need to consider reducing their throughput, increase the distance of emission sources to the nearest residential receptor, or proceed to a higher tier (Tier 3: Screening Dispersion Modeling or Tier 4: Detailed Risk Assessment) analysis. Overall, it is concluded that the impact of the proposed procedures is minimal. Staff recommends removing the exemption and using the proposed SCAQMD Risk Assessment Procedures (Version 8.1) for gasoline dispensing facilities.

List of Applicable Toxic Air Contaminants

Table 1 of Rule 1401 lists the toxic air contaminants that are subject to the rule and used to estimate health risks. The list consists of the compounds that OEHHA has provided acute, chronic, or carcinogenic health values. Periodically, OEHHA publishes new or updated health values and subsequently SCAQMD amends Table 1 to incorporate the new or updated information. Table 1 was last updated in 2010; in the interim, a number of health values have been published by OEHHA. Additionally, several compounds will be included on the list for clarity and consistency with California Air Resources Board's Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values which was last updated on February 23, 2017[6].

New Compounds

Caprolactum (Chemical Abstracts Service Number 105-60-2) – In 2013, OEHHA developed acute and chronic Reference Exposure Levels of 50 µg/m^3 and 2.2 µg/m^3 respectively. OEHHA states that exposure to caprolactum has been found to cause upper respiratory and eye irritation in both animals and humans; inflammation of the nasal and laryngeal epithelium in rodents; and reduced weight of offspring for pregnant rats administered high doses orally. According to OEHHA[7], the increased eye blink frequency with eye irritation are manifestations of the same underlying event of ocular trigeminal nerve activation. Thus, the acute reference exposure limit is based on eye blink frequency. The acute reference exposure limit of 50 µg/m^3 was established by applying a species uncertainty factor of 10 to the No Observed Adverse Effect Level (NOAEL) of 500 µg/m^3. The chronic value of 2.2 µg/m^3 was derived by the 95% lower confidence limit of the dose producing a 5% response rate for the nasal respiratory and olfactory changes and the non-keratinized laryngeal tissue changes found at terminal sacrifice. An uncertainty factor of 60 was applied because of interspecies and study length uncertainties.

The main use of caprolactum is in the polymerization process during the manufacture of Nylon-6. Nylon-6 is a widely used type of nylon and is found in textiles, engineered plastics, and films used in packaging and medical applications. Exposure to caprolactum may occur during the production and recycling of Nylon-6, and offgassing from carpeting and other textiles containing Nylon-6.

[6] Available on the internet at: https://www.arb.ca.gov/toxics/healthval/contable.pdf
[7] Available on the internet at: https://oehha.ca.gov/media/downloads/crnr/caprolactam2013.pdf

Permitted use of caprolactum will occur nearly exclusively in resin manufacturing facilities. As a Volatile Organic Compound, caprolactum emissions are already regulated in resin manufacturing facilities by SCAQMD Rule 1141 – Control of Volatile Organic Compound Emissions from Resin Manufacturing. The provisions in that rule require that volatile organic compound emissions, including caprolactum emissions, be reduced by 95% or more from blending, reaction, and processing operations. Therefore, the addition of acute and chronic health risk values are not expected to have any additional impacts on resin manufacturing operations as they already are required to control caprolactum emissions.

Carbonyl sulfide (Chemical Abstracts Service Number 463-58-1) – In 2017, OEHHA developed acute and chronic Reference Exposure Levels of 660 µg/m^3 and 10 µg/m^3 respectively[8]. OEHHA found that inhalation of carbonyl sulfide results in adverse health effects in the central nervous system. The NOAEL for carbonyl sulfide is 1,500,000 µg/m^3. The time-adjusted one hour NOAEL is 1,300,000 µg/m^3. The acute reference exposure limit was determined by applying an uncertainty factor of 2,000 to the time-adjusted one hour NOAEL resulting in an acute reference exposure limit of 660 µg/m^3. The uncertainty factor was based on limited information on acute toxicity and there were no pharmacokinetic modeling data available. For chronic exposures, the time-adjusted NOAEL was determined to be 130,000 µg/m^3. An uncertainty factor of 6,000 was applied resulting in a chronic reference exposure limit of 22 µg/m^3. The uncertainty factor was based on default factors for interspecies and intraspecies toxicokinetic and toxicodynamic differences.

For industrial uses, carbonyl sulfide is emitted from some refineries as an end product of sulfur combustion. It is also a potential grain fumigant replacing methyl bromide. In 2012, reported emissions of carbonyl sulfide in SCAQMD was just over 15,000 pounds annually with the largest facility reporting 7,706 pounds of annual emissions.

Refinery sources and potential fumigant sources of carbonyl sulfide are already closely controlled. Refineries reporting carbonyl sulfide emissions already determine health risks by accounting for contributions from carbonyl sulfide in the Air Toxics Hot Spots Program. Additionally, 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 as the sources of those emissions already are expected to have pollution control.

Compounds with Added Health Risk Values

Butadiene, 1,3- (Chemical Abstracts Service Number 106-99-0) – In 2013, OEHHA developed an acute reference exposure level of 660 µg/m^3 [9]. At the same time, OEHHA also updated the chronic inhalation health value to 2.0 µg/m^3. In 1992, OEHHA established a cancer inhalation unit risk value of 1.7x10-4 (µg/m^3)$^{-1}$. For permitted units, the cancer risk is generally orders of magnitude greater than the acute risk. Therefore the inclusion of an acute reference exposure level for 1,3-butadiene is not expected to have any additional impacts on permitted sources.

Toluene diisocyanates (Chemical Abstracts Service Number 26471-62-5), including toluene-2,4-diisocyante (Chemical Abstracts Service Number 584-84-9) and toluene-2,6-diisocyantate

[8] Available on the internet at: https://oehha.ca.gov/media/downloads/crnr/cosrel022117.pdf
[9] Available on the internet at: https://oehha.ca.gov/media/downloads/crnr/072613bentcrel.pdf

(Chemical Abstracts Service Number 91-08-7) – In 2016, OEHHA developed an acute reference exposure level of 2.0 µg/m^3 for the parent compound of toluene diisocyante and related compounds toluene-2,4-diisocyante and toluene-2,6-diisocyantate[10]. The chronic reference exposure level was also updated at the same time to 8x10-3 µg/m^3. However, the cancer inhalation unit risk, established in 1999, is 1.1x10-5 (µg/m^3)$^{-1}$ resulting in a cancer risk that is generally orders of magnitude greater than the acute risk. For permitted units, the inclusion of an acute reference exposure level for toluene diisocyantes is not expected to have any additional impacts.

Compounds Added for Clarification and Consistency

In two cases, a parent compound is listed in Table 1 of Rule 1401 while some associated compounds are not. To clarify the applicability of the compounds and to make Table 1 more consistent with the California Air Resources Board's Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values (February 23, 2017), the following related compounds in Table 6 below will be added to Table 1 of Rule 1401:

Table 6: Related Compounds Added for Clarification and Consistency

Compound	Chemical Abstracts Service Number	Already Listed Parent Compound
Barium chromate	10294-40-3	Chromium (hexavalent)
Calcium chromate	13765-19-0	Chromium (hexavalent)
Chromic trioxide	1333-82-0	Chromium (hexavalent)
Sodium dichromate	10588-01-9	Chromium (hexavalent)
Strontium chromate	7789-06-2	Chromium (hexavalent)
Zinc chromate	13530-65-9	Chromium (hexavalent)
Hexachlorocyclohexane, alpha	319-85-6	Hexachlorocyclohexanes (mixed or technical grade)
Hexachlorocyclohexane, beta	319-85-7	Hexachlorocyclohexanes (mixed or technical grade)

Similarly, in two other cases, a related compound is listed in Table 1 while the parent compound is not. The following parent compounds will be added to Table 1 of Rule 1401 as shown in Table 7 below.

Table 7: Parent Compounds Added for Clarification and Consistency

Parent Compound	Chemical Abstracts Service Number	Already Listed Related Compound
Fluorides	1101	Hydrogen fluoride
Vanadium	7440-62-2	Vanadium pentoxide

For both the newly added parent and related compounds, the effective date of rule applicability will be the same as the already listed compound.

[10] Available on the internet at: https://oehha.ca.gov/media/downloads/air/report-hot-spots/finaltdirelmarch2016.pdf

Finally, typographical errors were corrected for two compounds. Dichloroethylene, 1,1- (Chemical Abstracts Service Number 75-35-4) and methylene diphenyl isocyanate (Chemical Abstracts Service Number 101-68-8).

AFFECTED INDUSTRIES

Implementation of PAR 1401 is expected to potentially increase the estimated cancer risks for spray booths and gasoline dispensing facilities. SCAQMD staff conducted an analysis to better understand the number of sources that could be potential affected by the proposal. Staff estimates between zero and four spray booth permits annually could require higher level of air pollution controls. The expected additional air pollution control would be the replacement of HEPA filters with ULPA filters. Additionally, between zero and two new gasoline dispensing facilities permit applications annually will have a lower permitted throughput, consider increasing their distance of emission sources to the nearest residential receptor, or proceed to a Tier 3 or Tier 4 analysis requiring dispersion modeling. Finally, five refineries will see a negligible increase in cancer risk because of the addition of carbonyl sulfide to the Rule 1401 Toxic Air Contaminant list.

SOCIOECONOMIC ASSESSMENT

A socioeconomic assessment for PAR 1401 will be conducted and will be available to the public at least 30 days prior to the SCAQMD Governing Board Meeting anticipated for September 1, 2017.

CALIFORNIA ENVIRONMENTAL QUALITY ACT ANALYSIS

Pursuant to the California Environmental Quality Act (CEQA) and SCAQMD's Certified Regulatory Program (Rule 110), SCAQMD, as lead agency for the proposed project, has determined that implementation of PAR 1401 will not be expected to result in any potentially significant adverse environmental impacts. Further, since the proposed project will not be expected to have statewide, regional or areawide significance, no scoping meeting is required for the proposed project pursuant to Public Resources Code Section 21083.9 (a)(2). As such, SCAQMD is preparing an Environmental Assessment with less than significant impacts for PAR 1401.

DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727

Requirements to Make Findings

California Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the SCAQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report.

Necessity

PAR 1401 is needed to update rule language relating to risk assessment calculations such that they are consistent with those specified in the state OEHHA Risk Assessment Guidelines adopted on March 6, 2015.

Authority

The SCAQMD Governing Board has authority to adopt amendments to Rule 1401 pursuant to the California Health and Safety Code Sections 39002, 39650 et. seq., 40000, 40001, 40440, 40441,

40702, 40725 through 40728, 41508, 41700, 41706, 44360 through 44366, and 44390 through 44394.

Clarity
PAR 1401 is written or displayed so that its meaning can be easily understood by the persons directly affected by it.

Consistency
PAR 1401 is in harmony with and not in conflict with or contradictory to, existing statutes, court decisions or state or federal regulations.

Non-Duplication
PAR 1401 will not impose the same requirements as any existing state or federal regulations. The proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the SCAQMD.

Reference
By adopting PAR 1401, the SCAQMD Governing Board will be implementing, interpreting or making specific the provisions of the California Health and Safety Code Sections 39666 (District new source review rules for toxics), 41700 (prohibited discharges), and 44360 through 44366 (Risk Assessment).

Rule Adoption Relative to Cost-effectiveness
On October 14, 1994, the Governing Board adopted a resolution that requires staff to address whether rules being proposed for adoption are considered in the order of cost-effectiveness. The 2016 Air Quality Management Plan (AQMP) ranked, in the order of cost-effectiveness, all of the control measures for which costs were quantified. It is generally recommended that the most cost-effective actions be taken first. However, PAR 1401 is not a control measure that was included in the 2016 AQMP and was not ranked relative to other criteria pollutant control measures in the 2016 AQMP.

Incremental Cost-effectiveness
Health and Safety Code Section 40920.6 requires an incremental cost effectiveness analysis for Best Available Retrofit Control Technology (BARCT) rules or emission reduction strategies when there is more than one control option which would achieve the emission reduction objective of the proposed amendments, relative to ozone, CO, SOx, NOx, and their precursors. Since PAR 1401 applies to toxic air contaminants, the incremental cost effectiveness analysis requirement does not apply.

COMPARATIVE ANALYSIS

Health and Safety Code section 40727.2 requires a comparative analysis of the proposed amended rule with any Federal or District rules and regulations applicable to the same source. See Table 8 below.

Table 8
Comparative Analysis of PAR 1401 with Rules 212, 1401.1, 1402, and Federal Regulations

Rule Element	PAR 1401	Rule 212	Rule 1401.1	Rule 1402	Equivalent Federal Regulation
Applicability	New, relocated or modified permit unit	New or modified permit unit	New or relocated permit unit	Existing facilities subject to Air Toxics "Hot Spots" Information and Assessment Act of 1987 and facilities with total facility emissions exceeding any significant or action risk level	None
Requirements	Limits maximum individual cancer risk, cancer burden and chronic and acute hazards	Provide public notice to all nearby addresses projects that are located within 1,000 feet of a school, increase risk or nuisance, or increase criteria pollutants above specified thresholds	Limits cancer risk and chronic and acute hazards near schools	Submittal of health risk assessment for total facility emissions when notified. Implement risk reduction measures if facility-wide risk is greater than or equal to action risk level	None
Reporting	None	Verification that public notice has been distributed	None	Progress reports and updates to risk reduction plans	None
Monitoring	None	None	None	None	None
Recordkeeping	None	None	None	None	None