SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Supplement to the 24-Hour PM2.5 State Implementation Plan for the South Coast Air Basin

February 2015

Executive Officer
Barry R. Wallerstein, D. Env.

Deputy Executive Officer
Planning, Rule Development and Area Sources
Elaine Chang, DrPH

Assistant Deputy Executive Officer
Planning, Rule Development and Area Sources
Philip Fine, Ph.D.

Author:	Joseph Cassmassi	Planning and Rules Manager
	Sang-Mi Lee, Ph.D.	Program Supervisor
	Kalam Cheung, Ph.D.	Air Quality Specialist
	Michael Krause	Program Supervisor
Reviewed By:	Barbara Baird	Chief Deputy Counsel
	Megan Lorenz	Senior Deputy District Counsel

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PREFACE

A version of this Draft Supplement was made available at the SCAQMD Public Information Center on December 19, 2014 in accordance with the release of the noticing for the public hearings in February 2015 pursuant to the requirements of the Health & Safety Code § 40466. In response to comments and suggestions from the staff at U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB), some additions and clarifications have been included in a January 2015 version of the Draft Supplement that was considered and approved by the SCAQMD Governing Board at their February 6, 2015 Board Meeting for submission into the 24-hour PM2.5 State Implementation Plan (SIP) for the South Coast Air Basin. The additions and clarifications were accepted in this final version (February 2015) that will be forwarded to the CARB and subsequently U.S. EPA for approval as part of the California SIP.

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INTRODUCTION

The Federal Clean Air Act (CAA) requires the United States Environmental Protection Agency (U.S. EPA) to develop and enforce regulations to protect the public from airborne contaminants known to be hazardous to human health. To do so, the U.S. EPA sets National Ambient Air Quality Standards (NAAQS) for "criteria" pollutants, such as particulate matter less than 2.5 microns (PM2.5), and designates areas in attainment or in non-attainment of the NAAQS. According to the CAA, if an area is designated non-attainment, the state is required to submit a State Implementation Plan (SIP) to demonstrate how and when the NAAQS will be achieved, maintained and enforced. The federal SIP requirements for the South Coast Air Basin (Basin) non-attainment area are addressed through Air Quality Management Plans (AQMP) prepared by the South Coast Air Quality Management District (SCAQMD) in collaboration with the California Air Resources Board (CARB) and the South California Association of Governments (SCAG). Required elements of the SIP include:

- Emission Inventory *(CAA §172(c)(3)*)
- Attainment demonstration and modeling *(CAA §172(a)(2)(A)*)
- All Reasonably Available Control Measures (RACM) including adoption of Reasonably Available Control Technology (RACT) *(CAA § 172(c)(1)*)
- Demonstration of Reasonable Further Progress *(CAA §172(c)(2)*)
- New Source Review Program*(CAA §172(c)(4) and (5)*)
- Contingency measures *(CAA §172(c)(9)*)
- Transportation Control Measures *(CAA §108)(e)*

On December17, 2006, the U.S. EPA lowered the 24-hour PM2.5 NAAQS from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ and the South Coast Air Basin was subsequently designated non-attainment for 2006 24-hour PM2.5 NAAQS on December 14, 2009. U.S. EPA requires the SIP to be submitted no later than three years after the designation. To assist in the development of the SIPs to demonstrate attainment of the 2006 24-hour PM2.5 NAAQS, the U.S. EPA issued implementation guidance in March of 2012.

The 2012 AQMP was approved by the SCAQMD Governing Board in December 2012, with additional amendments approved in February 2013, and was subsequently submitted to CARB and the U.S. EPA for inclusion into the SIP. That plan demonstrated projected attainment of the 2006 24-hour PM2.5 NAAQS by 2014. However, a recent court decision (*Nat'l Res. Def. Council v. EPA*, 706 F.3d 428 (D.C. Cir. 2013)) compels U.S. EPA to evaluate the 24-hour PM2.5 SIP under CAA Subpart 4 requirements specific to particulate matter, in addition to the general planning provisions of Subpart 1 that were previously used for PM2.5 SIPs. Subpart 4 provides for an attainment year of 2015 for "moderate" areas, one year later than the attainment year in the 2012 AQMP. Furthermore, preliminary ambient air quality data suggests that

meeting the 2006 24-hour PM2.5 NAAQS by the end of 2014 is not likely, largely due to unusually extreme drought conditions in the Basin. Therefore, the purpose of this Supplement to the 24-hour PM2.5 SIP for the South Coast Air Basin is to demonstrate attainment of the 2006 24-hour PM2.5 NAAQS by 2015 as allowed under CAA Subpart 4. In addition, the Supplement will update the transportation conformity budgets, RACM/RACT analysis, emission reduction commitments submitted in the 2012 AQMP, and other Subpart 4 requirements.

2012 AIR QUALITY MANAGEMENT PLAN

The 2012 AQMP demonstrated attainment of the 2006 24-hour PM2.5 NAAQS (35 $\mu g/m^3$) with successful implementation of all feasible controls and assuming typical weather, demonstrated the earliest possible attainment date for the Basin was the end of 2014.

The 2012 AQMP included the items listed above but, more specifically, the following elements:

- Attainment demonstration of the 2006 24-hour PM2.5 NAAQS for 2014;
- A RACM/RACT analysis;
- 2014 transportation conformity budgets; and
- Control strategy including emission reduction commitments with adoption and implementation dates

Since the Governing Board approval of the 2012 AQMP in December 2012 with amendments in February 2013, two PM2.5 control measures, BCM-01 (Further Reductions from Residential Wood Burning Devices) and BCM-02 (Further Reductions from Open Burning), were adopted in the form of amendments to Rules 445 (Wood Burning Devices) and 444 (Open Burning), respectively. Together, these amendments generated a total of 11.7 tons of PM2.5 per day reductions on an episodic basis. The attainment demonstration relies primarily on emissions reductions associated with revisions to Rules 444 and 445. Both of these rule revisions have been adopted by SCAQMD and approved by U.S. EPA. (78 FR 59249, September 26, 2013).

The only other emission reduction commitment in the 2012 PM2.5 SIP was control measure CMB-01 (Further NOx Reductions from RECLAIM) which was submitted as a contingency measure only. This control measure is anticipated to be considered by the SCAQMD Governing Board in the first half of 2015. By implementing these control measures, the air quality modeling in the 2012 AQMP demonstrated attainment of the 2006 PM2.5 standard in 2014. However, as discussed later, unanticipated extreme weather conditions have affected air quality making attainment in 2014 unlikely.

U.S. EPA IMPLEMENTATION GUIDANCE FOR THE 2006 24-HOUR PM2.5 NAAQS

In March of 2012, U.S. EPA issued a memorandum to provide guidance regarding the development of SIPs required to demonstrate attainment of the 2006 24-hour PM2.5 NAAQS. The guidance included a section regarding "overall framework" based on CAA Subpart 1 for general nonattainment plan provisions, specifically section 172(a)(2)(A) that requires plans to demonstrate attainment "as expeditiously as practicable but no later than five years from the date such area was designated nonattainment.

The U.S. EPA's previous PM2.5 Implementation Rules and Guidance were challenged, partly because they were based on general implementation provisions under Subpart 1 of the CAA rather than the PM10 specific provision of Subpart 4 of the CAA. In January 2013, the U.S. Court of Appeals (*Nat'l Res. Def. Council v. EPA*, 706 F.3d 428 (D.C. Cir. 2013)) decided that the U.S. EPA misinterpreted the CAA relative to the statutory requirements for the 1997 PM2.5 standards, erred in applying the provisions of Subpart 1 rather than Subpart 4, and needs to re-promulgate the PM2.5 implementation rules with Subpart 4. On June 6, 2013, U.S. EPA withdrew the March 2012 Implementation Guidance for 2006 24-hour PM2.5 NAAQS.

CLEAN AIR ACT, TITLE 1, PART D, SUBPART 4

Title 1, Part D of the CAA outlines the plan requirements for nonattainment areas and is divided into six subparts. Subpart 1 provides general provisions for nonattainment areas; Subpart 2 through 4 include, respectively, additional provisions for ozone, carbon monoxide and particulate matter nonattainment areas. Subpart 5 consists of additional provisions for areas designated nonattainment for sulfur oxide, nitrogen dioxide or lead. Finally, Subpart 6 lists a general savings clause.

Provisions in Subpart 4 are based on the classification of the nonattainment region as moderate or serious. The South Coast Air Basin has been classified by U.S. EPA as moderate nonattainment for the 2006 24-hour PM2.5 NAAQS. For a moderate area, "the attainment date shall be, as expeditiously as practicable, but no later than the end of the sixth calendar year after the areas designation as nonattainment." (*CAA, Title 1, Part D, Subpart 4, Section 188(c)(1)*) As discussed earlier, the South Coast Air Basin designation as non-attainment for the 2006 24-hour PM2.5 NAAQS (35 $\mu g/m^3$) was effective December 14, 2009, thus providing for a latest attainment date of December 31, 2015. Subpart 4 provisions also allow for no more than 2 one-year extensions of the attainment date for a "moderate" area as long as all SIP commitments are met and if the previous single year's air quality shows attainment (*Section 188 (d)*). Finally, Subpart 4 Section 189(e) necessitates that control requirements applicable for major PM2.5

sources shall also apply to major sources of PM2.5 precursors unless U.S. EPA finds that major sources do not significantly contribute to nonattainment. PM2.5 has four major precursors, other than direct PM2.5 emissions, that contribute to the development of the ambient PM2.5: ammonia, nitrogen oxide (NOx), sulfur oxides (SOx), and volatile organic compounds (VOC).

AIR QUALITY MONITORING DATA

Preliminary air quality monitoring data indicates that attainment of the 2006 24-hour PM2.5 NAAQS (35 µg/m^3) is not likely to be achieved by the end of 2014. It should be noted that U.S. EPA has proposed to find that the former 24-hour PM2.5 NAAQS (65 µg/m^3) has been attained, along with the previous annual PM2.5 NAAQS of 15 µg/m^3 (79, FR, 72999, Dec 9, 2014). Attainment of the 2012 annual PM2.5 NAAQS of 12 µg/m^3 will be addressed in the upcoming 2016 AQMP.

With regard to the air quality monitoring, only the Mira Loma location in Western Riverside County exceeds the 2006 24-hour PM2.5 NAAQS. Attainment of the PM2.5 standard is based on a "design value" equal to the 3-year average of the annual 98th percentile concentration with prescribed rounding conventions. In the case of the 2006 24-hour PM2.5 NAAQS, attainment is achieved if this design value is less than 35.4 µg/m^3. Preliminary data through June 2014 shows a 98th percentile PM2.5 concentration in 2014 is 35 µg/m^3. However, including the 98th percentiles of the preceding two years as shown below, the design value at Mira Loma will likely exceed the standard. Note that the data for 2014 is preliminary, and that it does not include the November and December months of 2014 when exceedances have historically been observed.

2012: 35.8 µg/m^3

2013: 37.5 µg/m^3

2014: 35.0+ µg/m^3

3-Year Average: > 36 µg/m^3

Thus, according to this data, attainment of the 2006 24-hour PM2.5 NAAQS (35 µg/m^3) will not be achieved by the end of 2014 as anticipated in the 2012 AQMP. As discussed below, the higher levels in 2013 and possibly 2014, which reverse a long term trend of improving PM2.5 concentrations, were affected by extreme drought conditions in Southern California.

SUPPLEMENT TO THE 24-HOUR PM2.5 SIP

In close consultation with U.S. EPA and CARB, the SCAQMD is proposing to supplement the previous 24-hour PM2.5 SIP submittal to address Subpart 4 provisions and requirements with the following elements that are included in this Supplement:

- Demonstration of attainment of the 24-hour PM2.5 NAAQS by 2015;
- Discussion of the effects of the drought on the 2014 attainment date;
- Provide new transportation conformity budgets for 2015;
- Updated RACM/RACT analysis;
- Demonstration of compliance with CAA Subpart 4, Section 189(e) that applies to major source PM2.5 precursors, such as VOC and ammonia unless U.S. EPA finds these sources do not significantly contribute to nonattainment; and
- Updated list of control strategy commitments.

Upon adoption by the SCAQMD Governing Board, the Supplement will be submitted to CARB and subsequently to the U.S. EPA for inclusion into the SIP.

2015 ATTAINMENT DEMONSTRATION

The 2012 AQMP provided attainment projections for years 2014 and 2019 with the implementation of all feasible control measures. To show attainment of the 2006 24-hour PM2.5 NAAQS by 2015 as allowed under Subpart 4, the 2012 AQMP inventories and modeling results will be used in an interpolation analysis between the 2014 and 2019 projections. This demonstration can be found in Attachment A that also includes a discussion based on the emissions inventory and inter-pollutant weighting factors.

EFFECTS OF THE DROUGHT

Attachment B includes a weight-of-evidence discussion on the lack of rainfall and drought conditions in the South Coast Air Basin for the past two years, and how that has impacted the PM2.5 ambient levels. Limited rain means there is less crusting and wetting of soil and road surfaces. Thus, more road dust and fugitive dust emissions are generated. A reduced frequency of storms translates to fewer days of enhanced pollution dispersion. Without such dispersion, there is no deep mixing of the atmosphere, particulate matter captured by raindrops or wind to transport the pollution away from the region. Finally, Attachment B will include a discussion of the impact of a continued drought on the 2015 attainment demonstration. Given the weather conditions and ambient data in 2013 and 2014, the earliest practicable attainment date for the 24-hour PM2.5 NAAQS is 2015.

PATHS FORWARD

Despite the attainment demonstration mentioned above, there remains considerable uncertainty in the PM2.5 monitoring results for 2014 and the meteorological conditions and frequency of rainfall that will occur in 2015. In order to demonstrate attainment the 98th percentile of the 2015 24-hr PM2.5 readings at Mira Loma has to be significantly below the standard of 35.4 ug/m3 to compensate for high exceedances caused by the drought in 2013 and 2014, achieving a 3-year average design value at or below the standard. Although additional emissions reductions are expected in 2015, attainment of the standard, given the variability of weather conditions, remains far from certain. Acknowledging this uncertainty, there are several potential outcomes and pathways for the Basin's attainment status under the Clean Air Act depending on the actual certified air quality monitoring results for 2014 and 2015.

- 24-hour PM2.5 data at Mira Loma for 2014 and 2015 is clean enough to attain the standard based on a three-year (2013-2015) average design value. The Basin could then be re-designated as attainment for this PM2.5 standard

- The three-year average design value at Mira Loma does not show attainment in 2015, but the 98th percentile of the 24-hour PM2.5 data at Mira Loma for the single year 2015 is below 35.4 μg/m^3. Under CAA Subpart 4 provisions, if this air quality condition is met, and all PM2.5 SIP commitments have been satisfied, then the Basin is eligible for a one-year attainment date extension to 2016. A second one-year extension to 2017, if the same conditions are met in 2016, is also possible.

- The three-year average design value at Mira Loma does not show attainment in 2015 and the 98th percentile of the 24-hour PM2.5 data at Mira Loma for the single year 2015 is above 35.4 μg/m^3. Under Subpart 4 of the CAA, upon U.S. EPA's determination that the Basin failed to attain the standard by the attainment date, the Basin would be automatically reclassified from a "moderate" nonattainment area to a "serious" non-attainment area. The new attainment deadline would be 2019, and more stringent "serious" area requirements would apply, including requirements to implement Best Available Control Measures (BACM) and a lower major source threshold (70 tons per year vs. the current 100 tons per year). A full analysis for implementation of these requirements and other control measures to ensure attainment as expeditiously as practicable would be included in the 2016 AQMP, which is also addressing the annual 2012 PM2.5 standard.

2015 TRANSPORTATION CONFORMITY BUDGETS

Attachment C includes new transportation conformity budgets based on the interpolated 2015 vehicle miles traveled (VMT) used for the attainment demonstration.

RACM/RACT ANALYSIS

A RACM demonstration, including a RACT analysis, was submitted to U.S. EPA as component of 2012 AQMP. Updates to the RACM/RACT analysis, which addresses direct PM2.5 and precursor emissions, can be found in Attachment D.

CAA SUBPART 4, SECTION 189(e) AND OTHER PRECURSOR REQUIREMENTS

CAA Subpart 4, Section 189(e) addresses control requirements for major stationary sources of PM2.5 precursors, such as VOC and ammonia. The sections states, "the control requirements applicable under plans in effect under this part for major stationary sources of PM–10 shall also apply to major stationary sources of PM–10 precursors, except where the Administrator determines that such sources do not contribute significantly to PM–10 levels which exceed the standard in the area." SCAQMD staff's analysis (*see Attachment E*) shows that VOC and ammonia from major sources (100 tons per year or greater) do "not contribute significantly" to overall emissions and thus ambient PM2.5 levels. Furthermore, both VOC and ammonia are subject to requirements for Best Available Control Technology (BACT) under existing New Source Review at a zero threshold, so those emission will still be minimized. VOC emissions are also required to be offset when a new or modified source will emit four tons per year or more of VOC, well below the level at which the PM2.5 requirement would require offsets. So, the only practical difference between the existing control program for New Source Review and a program that expressly applies to VOC and ammonia as PM2.5 precursors is that any new or modified source of 100 tons per year or more of ammonia will not need offsets. As explained Attachment E, it is extremely unlikely that there would be a new stationary source of 100 tons per year of ammonia anywhere in the Basin. Moreover, the SCAQMD has adopted numerous rules limiting VOCs, continually seeking all feasible reductions, as part of the stringent ozone control program. Thus, the SCAQMD believes the requirements of CAA Subpart 4, Section 189(e) and other precursor requirements are satisfied and thus request that the Administrator of U.S. EPA makes this determination.

CONTROL STRATEGY COMMITMENTS

Attachment F provides an updated list of control strategy commitments originally proposed in the 2012 AQMP in Chapter 4 (Control Strategy and Implementation).

ATTACHMENT A

ATTAINMENT DEMONSTRATION OF THE 24–HOUR PM2.5 NATIONAL AMBIENT AIR QUALITY STANDARD FOR 2015

BACKGROUND

The 2012 AQMP provided a comprehensive attainment demonstration for the 2006 24-hour PM2.5 NAAQS (35 μg/m^3) in 2014 for the South Coast Air Basin (Basin). The analysis which is presented in Chapter 5 of the AQMP main document and Appendix V provides a detailed discussion of the modeling analysis including modeling platforms (both meteorological and dispersion), chemical modules, model parameterization, emissions, background concentrations, base year performance and future year baseline and controlled PM2.5 projections. The attainment demonstration was anchored using the 2008 base year AQMP inventory and future year projections based on regional growth factors provided by the Southern California Association of Governments. The analysis followed U.S. EPA modeling guidance in simulating the speciated 98th percentile 24-hour PM2.5 levels for the 2014 baseline and controlled emissions scenarios as well as the 2019, 2023 and 2030 controlled scenarios. The NWS WRF meteorological model and the CMAQ dispersion model coupled with SAPRC99 chemistry were the primary modeling tools employed in the analyses. Boundary conditions were developed from GEOS-Chem global simulation model output. Simulations were conducted for gridded domain encompassing the majority of Southern California, northern Baja Mexico and the eastern Pacific Ocean.

The analysis demonstrated attainment of the 24-hour standard in 2014 for the controlled emissions based on the application of simulation determined, particulate species specific, relative reduction factors (RRF) applied to a 5-year weighted speciated 2008 design value. The demonstration showed attainment in 2014 at the Mira Loma Basin design site for the controlled emissions with a predicted design concentration of 34.3 μg/m^3. Subsequent simulations for controlled emissions indicated that the standard would be met with a 2019 design value of 35.4 μg/m^3 decreasing to 33.7 μg/m^3 in 2023 and 33.4 μg/m^3 by 2030. (The threshold design value for demonstrating attainment to the standard for model simulations is set at 35.4 μg/m^3 based on established rounding conventions). The demonstration provided future year controlled emissions projections of 24-hr PM2.5 design values for six additional monitoring locations including Rubidoux, the former Basin design site, Fontana – an area heavily impacted by local industry including warehouse distribution centers, Central Los Angeles, South Long Beach and North Long Beach – areas impacted by goods movement related emissions sources, and Anaheim representing urban residential impacts. Finally the demonstration also included an unmonitored area analysis to confirm that all PM2.5 impact areas were being fully assessed in the analysis.

DROUGHT IMPACT ON AIR QUALITY

The west coast of the U.S. has experienced a severe drought for the past several years with 2013 annual rainfall total measured at Downtown Los Angeles of 3.6 inches, far below the 14.9 inch long term average. Rainfall events of 0.01 inches of rain or more were 25 percent lower than the average of 28 days typically occurring during the 1st and 4th quarters of the year. Under the

drought conditions, Mira Loma 24-hr PM2.5 98th percentile concentrations experienced a reversal in the long-term trend of declining concentrations rising from a 2012 value of 35.1 µg/m^3 to 37.5 µg/m^3 in 2013. Based on a conservative analysis of the impact of rain fall events on the 98th percentile concentration, the drought accounted for roughly 1.6 µg/m^3 additional mass to the observed 98th percentile concentration. (A discussion of the rain event-concentration impact is provided in Attachment B). It is anticipated that the 2014 Basin 24-hr PM2.5 design value (measured at Mira Loma) based on the 2012-2014 3-year average of the 98th percentile concentration will exceed 35.4 µg/m^3 due to the observed continuation of the drought.

ANALYSIS UPDATE

An update of the 2012 24-hour PM2.5 attainment demonstration has been conducted to show attainment of the NAAQS for the year 2015, based on a 2015 controlled emissions inventory. The analysis uses the 2014 and 2019 projected design values using the controlled emissions to calculate the 2015 expected design. The 2015 design value was calculated using linear interpolation by component species between the two milestone years. In addition, the analysis includes an update to the unmonitored area attainment demonstration.

To corroborate the interpolation based attainment demonstration, an analysis is provided to assess the impact to the 2014 design value resulting from changes in the projected controlled emissions inventory from 2014 to 2015 using emissions (tons per day) to species projected PM2.5 concentrations ratios.

2015 24-HR PM2.5 ATTAINMENT DEMONSTRATION

Table A-1 summarizes the site specific 2015 24-Hr PM2.5 attainment demonstration. The maximum concentration for the Basin is projected to continue to occur at the Mira Loma monitoring site with an expected design value of 34.5 µg/m^3. Figure A-1 illustrates the 2015 predicted design values by component species. The largest contribution to the 2015 design value is nitrate followed by organic carbon. Table A-2 provides the corresponding 2014 and 2019 projected design values for the seven stations analyzed in the interpolation analysis.

Appendix V of the 2012 AQMP provided a comprehensive unmonitored area analysis that demonstrates that all grid cells covered by the regional modeling simulation were predicted to have 2014 design concentrations meeting the 24-Hr PM2.5 35 µg/m^3 standard. The projected average change in design concentration between 2014 and 2015 is estimated to be a 0.2 µg/m^3 increase in PM2.5 but this will not result in a change in the attainment demonstration in 2015. A corresponding 0.2 µg/m^3 increase was added to the concentration in cell (89,58), the cell with the peak unmonitored area design concentration. The resulting design concentration of 31.4 µg/m^3 for 2015 meets the unmonitored area attainment test. TableA-3 summarizes the projected change in predicted particulate component species for the seven sites.

TABLE A-1

2015 24-Hr PM2.5 Attainment Demonstration

Station	Predicted Mass ($\mu g/m^3$)
Anaheim	27.0
S. Long Beach	25.0
Fontana	33.1
N. Long Beach	28.7
Los Angeles	31.8
Mira Loma	34.5
Rubidoux	32.5

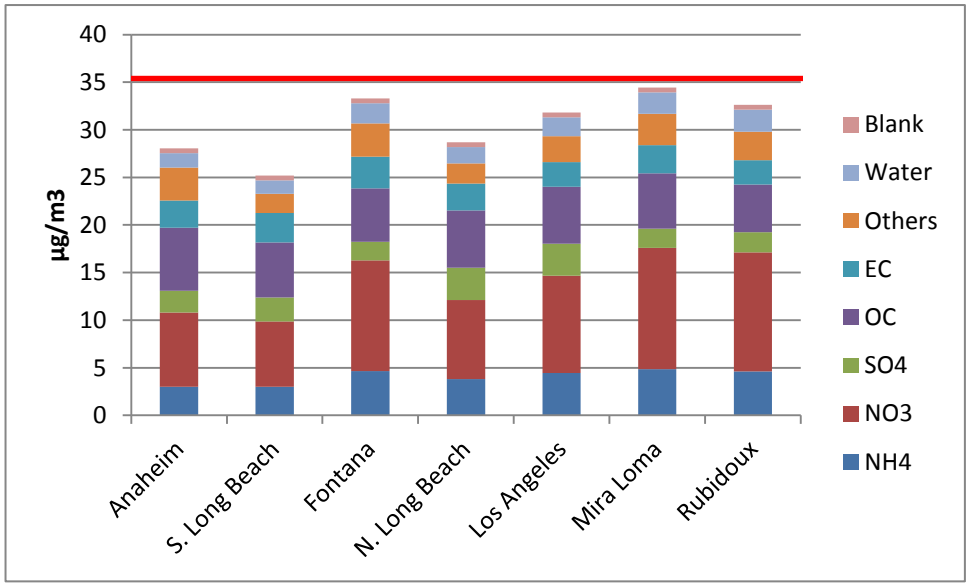

FIGURE A-1

2015 24-Hr PM2.5 Predicted Component Species Design Concentrations
(The red band at 3g micrograms per cubic meter depicts the Federal Standard)

KEY:

EC = elemental carbon
OC = organic carbon
SO4 = sulfate
NO3 = nitrate
NH4= ammonium
Others = crustal metals

TABLE A-2

Component Interpolated 24-Hour Average PM2.5 2015 Attainment Demonstration

YEAR	NH4	NO3	SO4	OC	EC	Others	Water	Blank	Mass
Anaheim									
2014	2.9	7.5	2.2	6.6	2.8	3.5	1.5	0.5	27.5
2015	**3.02**	**7.78**	**2.28**	**6.62**	**2.86**	**3.46**	**1.54**	**0.5**	**28.0**
2019	3.5	8.9	2.6	6.7	3.1	3.3	1.7	0.5	30.2
S. Long Beach									
2014	3	6.9	2.5	5.6	3.1	2	1.4	0.5	24.8
2015	**3**	**6.88**	**2.52**	**5.76**	**3.1**	**2.02**	**1.42**	**0.5**	**25.0**
2019	3	6.8	2.6	6.4	3.1	2.1	1.5	0.5	25.9
Fontana									
2014	4.7	11.8	1.9	5.3	3.3	3.5	2.1	0.5	32.9
2015	**4.64**	**11.66**	**1.92**	**5.64**	**3.32**	**3.5**	**2.1**	**0.5**	**33.1**
2019	4.4	11.1	2	7	3.4	3.5	2.1	0.5	33.9
N. Long Beach									
2014	3.8	8.2	3.4	5.8	2.8	2.1	1.7	0.5	28.3
2015	**3.82**	**8.28**	**3.4**	**6.04**	**2.82**	**2.12**	**1.72**	**0.5**	**28.7**
2019	3.9	8.6	3.4	7	2.9	2.2	1.8	0.5	30.3
Los Angeles									
2014	4.6	10.5	3.3	5.6	2.7	2.6	2	0.5	31.8
2015	**4.46**	**10.2**	**3.36**	**5.98**	**2.62**	**2.72**	**1.98**	**0.5**	**31.8**
2019	3.9	9	3.6	7.5	2.3	3.2	1.9	0.5	31.9
Mira Loma									
2014	4.9	12.8	2	5.6	2.9	3.2	2.3	0.5	34.3
2015	**4.86**	**12.72**	**2.02**	**5.84**	**2.96**	**3.28**	**2.26**	**0.5**	**34.5**
2019	4.7	12.4	2.1	6.8	3.2	3.6	2.1	0.5	35.4
Rubidoux									
2014	4.7	13	2	4.7	2.5	2.8	2.4	0.5	32.5
2015	**4.62**	**12.52**	**2.1**	**5.02**	**2.56**	**2.98**	**2.32**	**0.5**	**32.5**
2019	4.3	10.6	2.5	6.3	2.8	3.7	2	0.5	32.5

TABLE A-3

Average Interpolated Change in Component Species Concentrations from 2014 to 2015 ($\mu g/m^3$)

Station	NH4	NO3	SO4	OC	EC	Others	Water	Blank	Mass
Anaheim	0.1	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.5
S. Long Beach	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2
Fontana	-0.1	-0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.2
N. Long Beach	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.4
Los Angeles	-0.1	-0.3	0.1	0.4	-0.1	0.1	0.0	0.0	0.0
Mira Loma	0.0	-0.1	0.0	0.2	0.1	0.1	0.0	0.0	0.2
Rubidoux	-0.1	-0.5	0.1	0.3	0.1	0.2	-0.1	0.0	0.0
Average	**0.0**	**-0.1**	**0.0**	**0.2**	**0.0**	**0.1**	**0.0**	**0.0**	**0.2**

EMISSIONS INVENTORY APPROACH

Table A-4 presents the 2015 interpolated Basin total emissions inventory and the change from the 2014 projection. Both VOC and NOX emissions are projected to be lower by 7.9 and 17.8 TPD respectively in 2015. Little change was projected in SOx emissions and directly emitted particulate emissions are estimated to grow at a nominal rate of 0.1 tons per day. The 2012 AQMP provided a set of estimated emissions (TPD) to particulate formation potential ($\mu g/m^3$) ratios for VOC, NOx, SOx, and PM2.5 to secondary organic carbon, nitrate, sulfate and the combination of primary organic compound, elemental carbon and others. The ratios can provide an estimate of the relative contribution of emissions to particulate formation and be used to roughly estimate the magnitude of change in particulate expected from changes in the emissions inventory. Please note that the ratios were calculated specifically for a 2014 inventory; they are used here to estimate the magnitude of the expected net change in the 2015 PM2.5 particulate concentrations from 2014. These estimates are compared to the average change in component species concentrations (listed in Table A-2) where nitrates and sulfates are calculated to incorporate ammonium and bonded water.

As shown in Table A-4, the projected change in baseline emissions from 2014 to 2015 is estimated to result in 0.3 $\mu g/m^3$ reduction in regional nitrate and a small increase in primary PM2.5. The average projected changes in the 2015 attainment demonstration from the interpolation analysis show a comparable reduction in nitrate, a nominal increase (0.1 $\mu g/m^3$) in sulfate and a larger 0.2 $\mu g/m^3$ increase in primary PM2.5. While the estimates do not exactly match, the magnitude of the change and the direction (increase or decrease) for the key components is aligned. This indicates that the interpolated PM2.5 attainment demonstration is consistent with the projected change in emissions.

TABLE A-4

Average Interpolated Change in Component Species Concentrations from 2014 to 2015 (µg/m^3)

	VOC (TPD)	NOX (TPD)	SOX (TPD)	PM2.5 (TPD)
2014 Controlled Emissions	451.1	506.0	18.4	69.9
2015 Interpolated Controlled Emissions	443.2	488.2	18.4	70.0
TPD Change: 2014-2015	**-7.9**	**-17.8**	**0**	**+0.1**
	SECONDARY ORGANIC CARBON	**NITRATE**	**SULFATE**	**PRIMARY ORGANIC CARBON + ELEMENTAL CARBON + OTHERS**
Per Ton Conversion Factors: PM2.5 (µg/m3) /TPD	0.004	0.014	0.111	0.2132
2014-2015 Emissions Inventory Projected Change in PM2.5 (µg/m3)	0.0	-0.3	0	0.02
Average Simulated Change in PM2.5 Concentration (µg/m3) 2014-2105	0.0	-0.1	0.1	0.2

SUMMARY

The revised analysis demonstrates attainment of the 24-hour PM2.5 standard in the Basin, including unmonitored areas, by 2015 using interpolation techniques supported by projected emissions. However, there remains considerable uncertainty in the meteorological conditions and frequency of rainfall that will occur in 2015. In order to demonstrate attainment the 98th percentile of the 2015 24-hr PM2.5 readings at Mira Loma has to be significantly below the standard of 35.4 ug/m3 to compensate for high exceedances caused by the drought in 2013 and 2014, achieving a 3-year average design value at or below the standard. Although additional emissions reductions are expected in 2015, attainment of the standard, given the variability of weather conditions, remains far from certain.

REFERENCES

1. South Coast Air Quality Management District, Final 2012 Air Quality Management Plan, Diamond Bar, CA., February 2013.

2. South Coast Air Quality Management District, Final 2012 Air Quality Management Plan, Appendix V, Modeling Attainment Demonstrations, Diamond Bar, CA., February 2013.

ATTACHMENT B

EFFECTS OF THE DROUGHT

BACKGROUND

The 2014 attainment demonstration was based on simulated RRFs applied to a weighted 2008 design value. The 5-year weighted PM2.5 design value incorporated 98th percentile concentrations from 2006 through 2010. The five year period used for the design calculation covered a meteorological period, when assessed for the frequency of rainfall events and precipitation accumulations, was essentially average compared to the long term (50+ year) statistics. As a consequence, the 2014 projected 24-hour PM2.5 design value for Mira Loma assumed a similar window of average precipitation events and rainfall totals with the concurrent natural pollution dispersion potential associated with the unstable weather.

Unfortunately, the west coast of the U.S. has experienced a severe drought for the past several years with 2013 annual rainfall total measured at Downtown Los Angeles of 3.6 inches, far below the 14.9 inch long term average. Rainfall events of 0.01 inches of rain or more were 25 percent lower than the average of 28 days typically occurring during the 1st and 4th quarters of the year. Under the drought conditions, Mira Loma 24-hr PM2.5 98th percentile concentrations experienced a reversal in the long-term trend of declining concentrations rising from a 2012 value of 35.1 µg/m^3 to 37.5 µg/m^3 in 2013. Based on a conservative analysis of the impact of rain fall events on the 98th percentile concentration, the drought accounted for roughly 1.6 µg/m^3 to the observed 98th percentile concentration. (A discussion of the rain event-concentration impact is provided in the weight of evidence discussion).

Through October, the drought has continued and only 8 rain days have been observed at Downtown Los Angeles in 2014. More specifically, no rain fell in January with only two days of minor precipitation in February before the 26th. Note that historically the majority of exceedances of the standard occur between November and February. Concurrently, the preliminary un-validated observed 98th percentile concentration at Mira Loma was measured at 35 µg/m^3 through June. Given that the 4th quarter has the potential for higher PM2.5 concentrations, it is anticipated that the 2014 Basin 24-hr PM2.5 design value (measured at Mira Loma) based on the 2012-2014 3-year average of the 98th percentile concentration will exceed 35.4 µg/m^3.

The focus of this discussion is to address the impact of the drought on the 24-hour PM2.5 attainment by first developing a methodology to correct for variations in rainfall frequency then applying that methodology to the trend of ambient PM2.5 to determine the likelihood for future compliance.

ACCOUNTING FOR SEASONAL VARIATIONS IN RAINFALL FREQUENCY

As described above, the West Coast of the U.S. has been impacted by a multiple year drought that has reduced the frequency of rain events and increased the likelihood for atmospheric stagnation. A question has arisen as to what would be the impact to the 2015 attainment demonstration if the drought continues beyond 2014. To assess this potential situation, an algorithm was generated to adjust the predicted annual PM2.5 98th percentile concentration based on the deviation from the average expected rain frequency. The form of the adjustment was based on the rainfall correction applied to fugitive dust in U.S. EPA AP-42 and is presented through the following equation:

$$\text{Rain Frequency Factor (RFF)} = 1 + \left[\frac{(\text{Q-1 Exp} + \text{Q-4 Exp}) - (\text{Q-1 Obs} + \text{Q-4 Obs})}{182 - (\text{Q-1 Obs} + \text{Q-4 Obs})} \right]$$

Where:

Q-1 Exp = Number of 1st quarter expected rain events ≥ 0.01 " rainfall

Q-4 Exp = Number of 4th quarter expected rain events ≥ 0.01 " rainfall

Q-1 Obs = Number of 1st quarter observed rain events ≥ 0.01 " rainfall

Q-4 Obs = Number of 4th quarter observed rain events ≥ 0.01 " rainfall

The fit of the frequency of rainfall events in the 1st and 4th quarters to the quarterly total rainfall is depicted in Figures B-1a and B-1b. The greater variation in rainfall events occurs in the 1st quarter while the 4th quarter clusters around the number of events below 10. Overall, averages of 28 rain events are expected to occur between the two quarters.

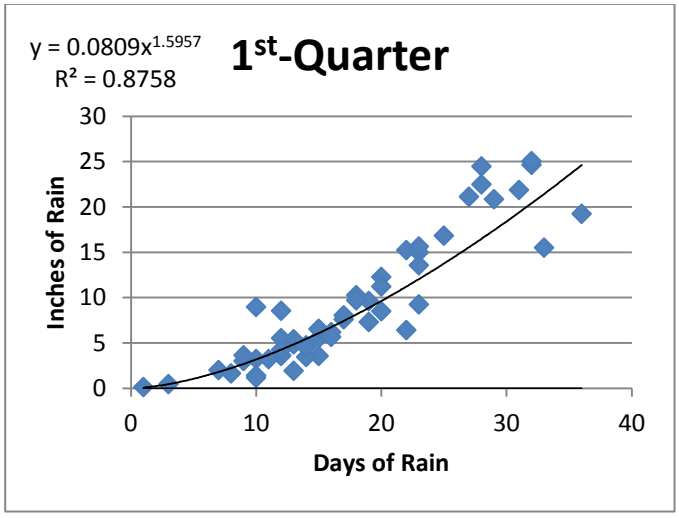

FIGURE B-1a

Power Fit of 1st Quarter Rain Events (1960-2013)

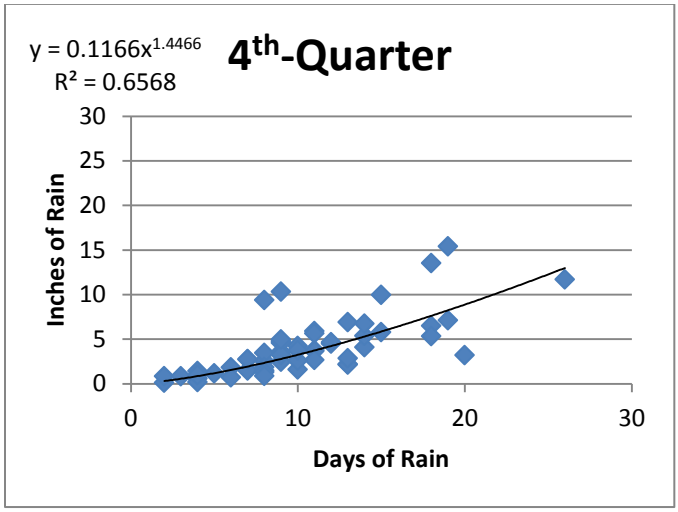

FIGURE B-1b

Power Fit of 4th Quarter Rain Events (1960-2013)

Figure B-2 depicts the trend of the drought adjustment factor calculated as the inverse of the rain frequency factor. The red circle focuses on 2006 - 2010, the period used to develop the 2008 weighted 24-hour PM2.5 design value for Mira Loma used in the attainment demonstration. When the same weighting scheme is applied to the adjustment factors, the average valued 0.999; thereby indicating the 2008 Mira Loma design value was not impacted by either drought or excessively frequent rain events. The adjustment factor was applied to the 2006 through 2013 Mira Loma 24-hour 98th percentile PM2.5 to normalize the annual concentration for year–to-year variations in drought potential. Figure B-3 presents the trend of the rain event normalized 98th percentile concentrations for Mira Loma. The trend was extended to both 2014 and 2015 to provide an estimate of the data for a normal rain event scenario (28 days combined for the 1st and 4th quarters).

Table B-1 provides the observed rain day summary for the Basin as measured at Downtown Los Angeles. Rain day totals for 2014 include the observed total for Q-1 and the long-term average number of days for Q-4. For this analysis, 2015 rain day totals are assumed equal to 2014 rain day totals. The rain frequency factor (RFF) is for each year and the adjustment factor (1/RFF) to estimate rainfall which assumes that the year experiences the long term average numbers of rain days are also provided.

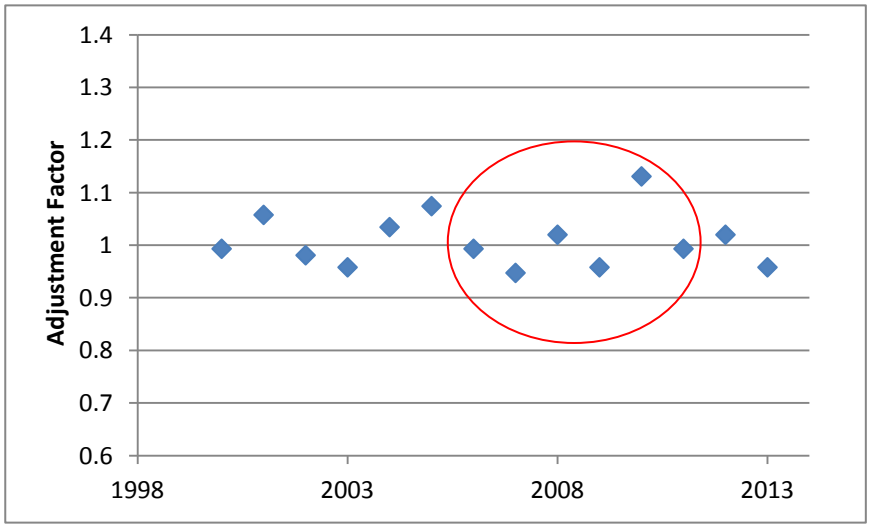

FIGURE B-2

Trend of Annual Drought Adjustment Factor (1/RFF)

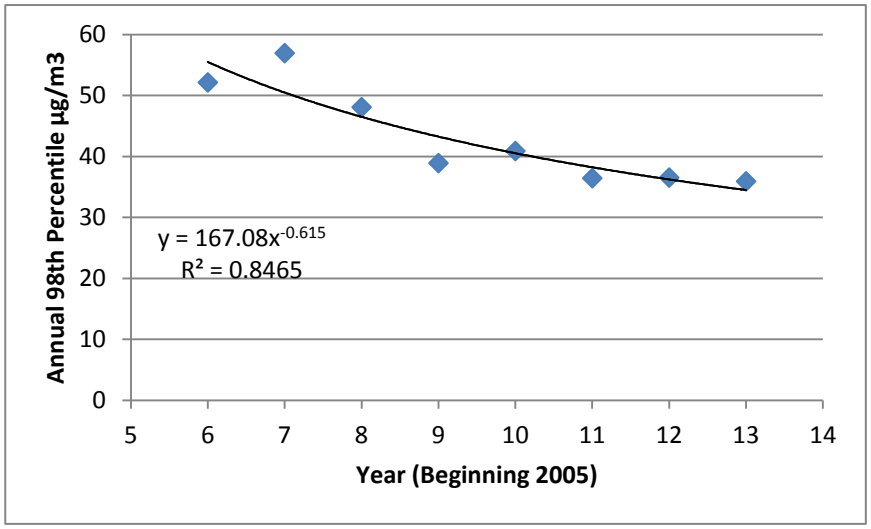

FIGURE B-3

Power Law Fit of Mira Loma PM2.5 Adjusted for Normal Rainfall

TABLE B-1

Trend Estimated Impact of the Drought on Basin 24-Hr PM2.5 Attainment

2006	2007	2008	2009	2010	2011	2012	2013	2014*	2015**
Annual Rainfall									
11.61	5.66	14.43	9.39	23.09	12.26	8.15	3.6	5.16	5.16
Q-1 Rain Days									
19	10	19	12	18	17	11	13	8	8
Q-4 Rain Days									
8	9	12	9	26	10	20	8	10	10
Q-1 & Q-4 Rain Days									
27	19	31	21	44	27	31	21	18	18
Rain Freq Factor (RFF)									
1.006	1.055	0.98	1.043	0.884	1.006	0.98	1.043	1.061	1.061
Adjustment Factor (1/RFF) To Estimate PM2.5 for Average Weather Year Rainfall									
0.994	0.948	1.02	0.958	1.131	0.994	1.02	0.958	0.943	0.943

* 2014 Q-4 rain events assumed average (10)

** 2015 Drought assumed as severe as 2014

ESTIMATING THE IMPACT OF THE DROUGHT ON THE PM2.5 TREND

Table B-2 first presents the 24-hr PM2.5 data for the Mira Loma design site including the observed 98th percentile concentration from 2006 through 2013 and the three year average design value for 2008 through 2013. Table B-2 then outlines the steps to estimate the drought impact to the observed Mira Loma annual 98th percentile concentration and the methodology to estimate the impact to both 2014 and 2015.

Step-1 adjusts the observed 98th percentile Mira Loma data to estimate the trend for average rain events. Step-2 and Step-3 use the power law equation (shown in Figure A-4) to estimate the 98th percentile concentration at Mira Loma for 2006 through 2015 based on the trend and the assumption of average rain event occurrences. The trend projected concentrations for 2014 and 2015 are projected to be 32.97 and 31.60 µg/m^3 for average rain years. Step-5 applies the RFF to the 2014 and 2015 normalized 98th percentile PM2.5 estimated concentrations to address the drought conditions. Step-6 adds the projected 2014 drought impacted 98th percentile concentration to the observed values for 2006 through 2013. Step-7 presents the revised design values which now incorporate the estimated impact of the 2014 drought. As estimated, the 2014 design value is expected to fail to meet attainment reflecting the severity of the 2013 and 2014 drought conditions. Steps-8 and-9 repeat Steps-6 and-7 but with the addition of the 2015 power law estimated 2015 98th percentile to estimate the potential for attainment to the NAAQS if the weather returns to average conditions. In this scenario, the projected 2015 98th percentile concentration and the 2015 design value will meet the NAAQS. Steps-10 and -11 repeat steps-8 and -9 for the 2015 assumption of continued drought. As calculated, the projected 2015 98th percentile concentration and the 2015 design value will still meet the NAAQS under continued drought conditions.

SUMMARY

The preceding analysis projects attainment of the 24-hour PM2.5 standard by 2015, considering the effects of recent drought conditions. However, there remains considerable uncertainty in the PM2.5 monitoring results for 2014 and the meteorological conditions and frequency of rainfall that will occur in 2015. In order to demonstrate attainment the 98th percentile of the 2015 24-hr PM2.5 readings at Mira Loma has to be significantly below the standard of 35.4 ug/m3 to compensate for high exceedances caused by the drought in 2013 and 2014, achieving a 3-year average design value at or below the standard. Although additional emissions reductions are expected in 2015, attainment of the standard, given the variability of weather conditions, remains far from certain.

TABLE B-2

Trend Estimated Impact of the Drought on Basin 24-Hr PM2.5 Attainment

2006	2007	2008	2009	2010	2011	2012	2013	2014*	2015**
Mira Loma Observed 98th Percentile PM2.5									
52.5	60.1	47.14	40.62	36.17	36.7	35.83	37.5		
Mira Loma PM2.5 Design* **									
		53.2	49.3	41.3	37.8	36.2	36.7		
Step-1: Mira Loma Adjusted for Average Weather Year Rainfall									
52.16	56.96	48.1	38.93	40.91	36.46	36.56	35.94		
Step-2: Mira Loma Design Adjusted for Average Weather Year Rainfall									
		52.4	48	42.6	38.8	38	36.3		
Step-3: Power Law Fit of Mira Loma Adjusted for Average Weather Year Rainfall									
55.51	50.49	46.51	43.26	40.54	38.24	36.24	34.5		
Step-4: Mira Loma Trend Projected 2014 & 2015 98th Percentile PM2.5 With Average Rainfall									
								32.97	31.60
Step-5: Mira Loma Trend Projected 2014 & 2015 98th Percentile PM2.5 Adjusted for Drought									
								34.98	33.53
Step-6: Mira Loma 98th Percentile with Trend Projected 2014 98th Percentile PM2.5 Adjusted for Drought									
52.5	60.1	47.14	40.62	36.17	36.7	35.83	37.5	34.98	
Step-7: Mira Loma Design with Trend Projected 2014 98th Percentile PM2.5 Adjusted for Drought									
		53.2	49.3	41.3	37.8	36.2	36.7	36.1	
Step -8: Mira Loma 98th Percentile with Trend Projected 2014 98th Percentile PM2.5 Adjusted for Drought & 2015 Average									
52.5	60.1	47.14	40.62	36.17	36.7	35.83	37.5	34.98	31.60
Step-9: Mira Loma Design with Trend Projected 2014 98th Percentile PM2.5 Adjusted for Drought & Average 2015									
		53.2	49.3	41.3	37.8	36.2	36.7	36.1	34.7
Step-10: Mira Loma 98th Percentile with Trend Projected 2014 & 2015 98th Percentile PM2.5 Adjusted for Drought									
52.5	60.1	47.14	40.62	36.17	36.7	35.83	37.5	34.98	33.53
Step-11: Mira Loma Design with Trend Projected 2014 & 2015 98th Percentile PM2.5 Adjusted for Drought									
		53.2	49.3	41.3	37.8	36.2	36.7	36.1	35.3

* 2014 Q-4 rain events assumed average (10)

** 2015 Drought assumed as severe as 2014

*** Design values are based on 3-year average and 98th percentile concentration. For example, 53.2 µg/m^3 in 2008 is derived from the average of 2006-2008 data (52.5 + 60.1 + 47.14)/3 = 53.2 µg/m^3

REFERENCES

1. South Coast Air Quality Management District, Final 2012 Air Quality Management Plan, Diamond Bar, CA., February 2013.

2. South Coast Air Quality Management District, Final 2012 Air Quality Management Plan, Appendix V, Modeling Attainment Demonstrations, Diamond Bar, CA., February 2013.

3. U.S. EPA, AP-42, Section 13.2.1, Paved Roads, http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf.

ATTACHMENT C

NEW TRANSPORTATION CONFORMITY BUDGETS FOR 2015

BACKGROUND

U.S. EPA's transportation conformity rule, found in 40 CFR parts 51 and 93, details the requirements for establishing motor vehicle emissions budgets in SIPs for the purpose of ensuring the conformity of transportation plans and programs with the SIP attainment demonstration. The on-road motor vehicle emissions budgets act as a "ceiling" for future on-road mobile source emissions. Exceedances of the budget indicate an inconsistency with the SIP, and could lead to a conformity "lapse" and its related consequences if not corrected before the next conformity deadline (e.g., during a lapse, certain categories of transportation projects cannot proceed). As required by the CAA, a comparison of regional on-road mobile source emissions to these budgets will occur during the periodic updates of regional transportation plans and programs.

The on-road motor vehicle emissions estimates for the Final 2012 AQMP were analyzed using CARB's EMFAC2011 emission factors for the transportation activity data provided by Southern California Association of Governments (SCAG) from their adopted 2012 Regional Transportation Plan (2012 RTP). This update which is in response to the Subpart-4 requirements replaces the on-road motor vehicle budgets for 2014 with those for 2015 the revised attainment date. The PM2.5 emissions budgets for PM2.5, and the PM2.5 precursors, VOC and NOx, are derived from the annual average inventory.

This approach is consistent with U.S. EPA's transportation conformity rule, which provides that if emissions budgets rely on new control measures, these measures must be specified in the SIP and the emissions reductions from each control measure must be quantified and supported by agency commitments for adoption and implementation schedules. Moreover, the rule provides that conformity analyses by transportation agencies may not take credit for measures which have not been implemented unless the measures are "projects, programs, or activities" in the SIP supported by written implementation commitments by the responsible agencies (40 CFR 93.122(a)(3)). The emissions budgets for PM2.5 are provided for the 2015 attainment year. However, since transportation analyses are needed beyond the attainment dates, the carrying capacities for the PM2.5 attainment demonstration also serve as the budgets for future years. For transportation conformity analysis, a trading mechanism can be established based on the PM2.5 forming potential developed through the modeling analysis for the emission budgets for various pollutants in SCAB.

2015 VMT AND MOTOR VEHICLE BUDGETS

As previously stated, the 2014 motor vehicle emissions budgets were based on 2012 RTP Final annual average VMT data provided by SCAG. At that time, SCAG provided VMT projections for several milestone years including 2019. Attachment D of Appendix III of the 2012 AQMP

lists the VMT distributions and on-road emissions by vehicle category generated by EMFAC11 using the 2012 RTP VMT for the two years.

The 2015 VMT distribution was interpolated from the 2012 RTP analysis years 2014 and 2019 profiles provided by SCAG. The 2015 VMT derived from the interpolation was input to EMFAC11 to generate the 2015 on-road motor vehicle emissions budgets listed in Table C-1.

TABLE C-1

2015 Motor Vehicle Emissions Budgets: PM2.5
(Annual Average - Tons Per Day)*

	VOC	NOx	PM2.5
Baseline EMFAC 2011	114.26	265.94	11.74
RFG	-4.27	--	--
SMOG Check	-4.75	-2.60	--
PM2.5: Re-entrained Road Dust (paved)	--	--	7.29
PM2.5 Re-entrained Road Dust (unpaved)	--	--	0.58
Road Construction Dust	--	--	0.22
2015 Mobile Source Emission Budget**	**106**	**264**	**20**

*Rounded up to the nearest whole number
**2015 budget is applicable to all future years beyond 2015.

In the Final 2012 AQMP the approximate weighting ratios of the precursor emissions for 24-hour PM2.5 formation in equivalent tons per day of NOx are: VOC: 0.3 (reducing one ton of VOC is equivalent to reducing 0.3 ton of NOx), NOx: 1.0, and PM2.5: 14.8 (i.e., reducing one ton of PM2.5 is equivalent to reducing 14.8 tons of NOx). This mechanism allows emissions below the budget for one pollutant to be used to supplement another pollutant exceeding the budget based on the ratios established herein. Clear documentation of the calculations used in the trading should be included in the conformity analysis. This trading approach is consistent with what U.S. EPA approved in 2011, The Revisions to the 2007 PM2.5 SIP, where the precursor substitution methodology was established.

The basic trading ratios are defined by the 24-hour PM2.5 regional modeling attainment demonstration. Briefly, NOx emissions reductions are scaled to the reduction of Basin ammonium nitrate (including water bonding). Similarly, reductions of VOC are scaled to changes in the organic carbon species while reductions in directly emitted particulates are scaled

to the projected changes in the elemental carbon and "others" portions of the PM2.5 mass. Table C-2 summarizes the trading equivalencies in TPD.

TABLE C-2

Trading Equivalencies for PM2.5Motor Vehicle Emissions Budgets

ONE TON OF	IS EQUIVALENT IN TERMS OF PM2.5 FORMATION TO THIS MANY TONS OF		
	NOx:	**VOC:**	**PM2.5:**
NOx	1	3.151	0.067
VOC	0.317	1	0.021
PM2.5	14.833	46.792	1

An example of how the trading mechanism would work follows; If the amount of NOx calculated exceeds the budget by 0.75 TPD, then that overage could be offset by trading 2.36 TPD of excess VOC emissions reductions (e.g 3.151 VOC/1 ton of NOx x 0.75 TPD NOx required = 2.36 TPD VOC). In this case, "excess" VOC emission reductions would be those beyond what are needed to meet the VOC budget. Similarly 0.050 TPD of directly emitted PM2.5 emissions below the budgeted amount could also be traded to the NOx emissions category and subtracted from the NOx total to allow NOx to meet its budget. In other words, the trading mechanism can be multi-pollutant and multi-directions. It should be noted that the trading calculations are performed prior to the final rounding to demonstrate conformity with the budgets.

ATTACHMENT D

UPDATED RACM/RACT ANALYSIS

INTRODUCTION

In accordance with the April 25, 2014 final rule "Identification of Nonattainment Classification and Deadlines for Submission of State Implementation Plan (SIP) Provisions for the 1997 Fine Particle (PM2.5) National Ambient Air Quality Standard (NAAQS) and 2006 PM2.5 NAAQS," (79 FR 31566; June 2, 2014), under Subpart 4, the South Coast Air Basin (Basin) is classified as a "moderate" non-attainment area with respect to the 2006 24-hour PM2.5 NAAQS. The EPA Final Rule requires that areas classified as moderate nonattainment or higher to develop and submit a demonstration that their current air pollution rules fulfill the 24-hour PM2.5 Reasonably Available Control Measures (RACM)/ Reasonably Available Control Technology (RACT) assessment. The RACM/RACT analysis provides a comparison of the SCAQMD rules and regulations governing precursor emission limits to those established by U.S. EPA guidance and representative agencies within California and elsewhere throughout the U.S. As a component of the 2012 Air Quality Management Plan (AQMP), a RACM/RACT Demonstration for 24-hour PM2.5 was submitted to U.S. EPA for inclusion in the California SIP.

This PM2.5 RACM/RACT analysis serves as a supplement to the 2012 AQMP submittal to review and where applicable update the SCAQMD toolkit to advance emissions controls to meet the current state of the science.

REGULATORY HISTORY

RACM/RACT analyses were incorporated as components of the 2007 and 2012 Air Quality Management Plan (AQMP). The 2007 demonstration was a comprehensive analysis conducted to identify and select control measures to reduce ozone and particulate precursors NOx, VOC, SOx and particulate emissions (to meet the 8-hour ozone and annual PM2.5 standards). The 2007 RACM/RACT analysis focused on rules, Control Technique Guidelines (CTGs) and Alternative Control Techniques (ACTs) adopted through 2006. The analysis identified one SCAQMD rule that required additional evaluation. The 2007 AQMP RACM/RACT analysis was approved by U.S. EPA for inclusion in the SIP in 2011.

The 2012 RACM/RACT analysis focused on precursors of PM2.5 (including ammonia, NOx, SOX, VOC and particulate matter) to attain the 24-hour average PM2.5 standard. From 2006 through 2012, 12 CTGs and ACTs were updated. To address this, the 2012 RACM/RACT analysis evaluated more than 100 rules and regulations, and 100 control measures developed in the 2007-2012 timeframe by other air districts in the nation. Through this analysis, three additional rules (SCAQMD Rules 1115, 1130 and 1168) were targeted for further evaluation and potential rule development. The 2012 RACM/RACT analysis was submitted to U.S. EPA where evaluation and approval is pending.

Subsequently in July 2014, the SCAQMD submitted a RACT SIP update to U.S. EPA as a component of the 2016 AQMP. The 2016 RACT analysis built upon the 2007 and 2012 RACM/RACT assessments focuses on recently adopted rules and regulation by other agencies in California and the nation. It is important to note that no additional CTG or ACTs were released since the 2012 evaluation. The 2016 RACT analysis evaluated more than 30 rules that were recently developed/amended by other ozone nonattainment air districts from September 2012 through November 2014 and identified six SCAQMD rules that have discrepancies with the companion rules at other California agencies.

Table D-1 summarizes the number of rules assessed between the two prior RACM/RACT analyses. Overall, the three assessments concluded that the SCAQMD's rules and regulations were for the most part equivalent to, or more stringent than other districts' rules and regulations and their proposed control measures in their respective SIPs. Several of the SCAQMD rules identified for evaluation have been amended to address the targeted issue.

The 2007 RACM/RACT assessments "Appendix VI: Reasonably Available Control Measures (RACM) Demonstration" is available at:
http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2007-air-quality-management-plan/2007-aqmp-appendix-vi.pdf?sfvrsn=2

The 2012 RACM/RACT assessments "Appendix VI: Reasonably Available Control Measures (RACM) Demonstration" is available at:
http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2012-air-quality-management-plan/final-2012-aqmp-(february-2013)/appendix-vi-final-2012.pdf

The 2016 AQMP RACT Analysis, Governing Board Letter, and Resolution are available at:
http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2014/2014-jun6-031.pdf?sfvrsn=2

RACM/RACT EVALUATION UPDATE

This addendum to the 2012 RACT demonstration provides another update to the corresponding analyses discussed above. According to the 2013 Annual Emissions Report (AER), there are 25 major source facilities of PM2.5 or precursors (> 100 TPY of ROG, NOx, SOx or TSP) in the Basin. New sources or sources undergoing modification/relocation after the previous RACT determination are subject to Best Available Control Technology (BACT), Best Available Retrofit Control Technology (BARCT) or Lowest Achievable Emissions Rate (LAER) requirement, which are more stringent than RACT. The current update evaluated rules governing emissions limits and modes of operation for the five precursor emissions categories including particulate matter, SOx, NOx, VOCs and ammonia (NH_3). Table D-2 provides a summary of SCAQMD

rules evaluated for PM2.5 precursor emissions control effectiveness. Since the 2012 AQMP submittal, the U.S. EPA has not issued new CTGs or ACTs documents for VOC and NOx sources. SCAQMD rules applicable to major source facilities were determined RACT in the 2007/2012 RACM/RACT assessments. Table D-3 provides an updated brief discussion of the RACT issues for rules identified for further evaluation in the three demonstrations. In particular, the 2016 8-hour ozone RACT update identified six SCAQMD rules that have discrepancies with companion rules at other California Agencies. Staff has completed their initial assessment and two rules may potentially require updating and amendment:

- **Rule 2002** – The current NOx emissions rate limit for cement kilns in SCAQMD is slightly higher when compared to the Bay Area AQMD Regulation 9, Rule 13 (2.73 vs, 2.3 lbs/ton of clinker). The RECLAIM program is currently being evaluated to establish new BARCT emissions limits and facility allocations. The proposed new limit (0.5 lbs/ton clinker) exceeds RACT. The proposed amendment to the NOx RECLAIM is underway and is scheduled for adoption in the second quarter of 2015.

- **Rule 1115** - Rule 1115 is not as stringent as the 2008 EPA CTG for a few coating processes for facilities emitting > 15 lbs/day. Staff will commit to further rule evaluation.

Tables D-4 through D-8, provide the specific RACT analysis for particulate matter, SOx, NOx, VOC and NH3 rules and regulations, respectively. In the tables a rule is specifically designated to meet RACT if the applicable CTG or ACT is met and has been approved in the 2007 SIP. The category defined as RACT Equivalent has been designated to delineate if the rule meets the RACT criteria but has minor differences in application and implementation at other agencies. Where a rule has been identified as undergoing amendment or has been targeted for further evaluation, a brief description of the issues and current/future actions are discussed. As previously stated, the SCAQMD's rules and regulations were for the most part equivalent to, or more stringent than other districts' rules and regulations.

Ammonia is currently regulated in the South Coast Air Basin through existing SCAQMD rules (see Table D-8) and is included as part of the control strategy in the 2012 AQMP, specifically control measure BCM-04 (*Further Ammonia Reductions from Livestock Waste*) listed in Table F-1 in Attachment F. Potential ammonia controls are also evaluated under the updated RACM/RACT Analysis (see Table D-8). But note that as discussed in Attachment E, ammonia controls are much less effective at reducing ambient PM2.5 levels than other precursors. Also note that the South Coast Air Basin is currently close to meeting the 24-hour PM2.5 standard (see "Air Quality Monitoring Data" on page 4 of the Supplement) and anticipated to meet the standard this year (see Attainment Demonstration in Attachment A). Under the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990 (57 FR 13498 at 13560 (April 16, 1992), ''where measures that might in fact be available for

implementation in the nonattainment area could not be implemented on a schedule that would advance the date for attainment in the area, EPA would not consider it reasonable to require implementation of such measures.'' Given that the U.S. Court of Appeals (*Nat'l Res. Def. Council v. EPA*, 706 F.3d 428 (D.C. Cir. 2013)) decided in January 2013 to compel U.S. EPA to apply Subpart 4 planning provisions to PM2.5, the resulting withdrawal of the EPA Implementation Guidance occurred in June 2013, the re-classification of the South Coast PM2.5 nonattainment area to Moderate was finalized in July 2014, and the fact that rulemaking takes many months to complete, no new potential measures identified in the current RACM/RACT analysis could possibly be implemented in time to advance the attainment date to 2014. As such, no further measures beyond the control strategy in the 2012 AQMP are being proposed at this time as a result of the RACM/RACT analysis.

SUMMARY

This analysis updates the three preceding RACM/RACT and RACT analyses. Overall, the SCAQMD makes the following general findings:

1. SCAQMD's rules, meet the U.S. EPA's criteria for RACT acceptability equaling or exceeding applicable CTG and ACT specifications and demonstrating comparable emissions limits and requirements to other agency rules.
2. The RACT analysis covers all 5 PM2.5 precursor emissions categories.
3. All new major sources in the Basin are subject to BACT under NSR, which is by definition more stringent than RACT.
4. SCAQMD commits to further evaluate the rules identified above for potential emission reductions as part of the 2016 AQMP control development.

TABLE D-1

Summary of Recent SCAQMD RACT and RACM/RACT Analyses

SIP	TYPE SUBMITTAL	STATUS	NUMBER OF SCAQMD RULE/ REGULATIONS EVALUATED	NUMBER OF UPDATED CTGS/ACTS ASSESSED	RULES REQUIRING FURTHER EVALUATION
2007	RACM/RACT	EPA Approval 11/09/11	82	4	Rule 1130
2012	RACM/RACT	Pending	>100	12	Rule 1130 Rule 1115 Rule 1168
2016	RACT	Pending	20	0	Rule 223 Rule 462 Rules 1112/2002 Rules 1118/1150.1 Rule 1130 Rule 1148.1

TABLE D-2

Summary of SCAQMD Rules Evaluated For PM2.5 Precursor Emissions Control Effectiveness

PRECURSOR	NUMBER OF APPLICABLE SCAQMD RULES	DIRECT SOURCE RULES	DISTRICT MOBILE SOURCE RULES	PROHIBITIONS	AMENDED SINCE 2006
PM	27	15	5	7	7
SOx	13	6	5	2	1
NOx	22	15	5	2	10
VOC	57	52	5	0	21
NH3	5	5	0	0	3

TABLE D-3

Updates of the Rules Further Evaluated in the 2012 RACT/RACM Demonstration and 2016 RACT Analysis

RULE(S)	SCAQMD EVALUATION
223	Rule 223 meets RACT through its implementation of technically feasible mitigation measures. The focus of the SJVAPCD rule is not applicable in the Basin for dry feed operations.
462	Rule 462 is more stringent than the CTG and meets the core requirements for RACT but not as stringent as BAAQMD Rule 8-33 with respect to the emissions limit for Class A facilities. Staff will commit to further rule evaluation.
1112/2002	Cement Kiln emissions limits were evaluated as part of the 2005 RECLAIM (Rule 2002) update. RECLAIM is currently being evaluated to establish new BARCT emissions limits and facility allocations. The proposed new limits exceed RACT. The RECLAIM amendment is projected to be considered for adoption by the second quarter of 2015.
1115	Rule 1115 is not as stringent as the 2008 EPA CTGs for a few coating processes for facilities emitting > 15 lbs/day. The two facilities subject to Rule 1115 have a small emission inventory of about 0.02 tpd. Staff will commit to further rule evaluation.
1118/1150.1	Rule 1118 was determined to be RACT from the 2007 SIP targeting flare emissions from refinery. SJVAPCD Rule 4311 (exempting municipal landfills) applies to other sources > 10 TPY. SCAQMD has a small inventory of flare emissions from sources other than refinery and landfill (regulated by Rule 1150.1). Rules 1118 is consistent with SJVAPCD Rule 4311 and therefore meets RACT.
1130	Rule 1130 was recently amended to reduce fountain solution VOC content to between 16-85 g/L with optional control device efficiency of 90-95%. The rule meets current CTG specifications.
1148.1	Glycol dehydrators in gas and oil production regulated by VCAPCD's Rule 71.5 are jointly regulated by SCAQMD Rules 1148.1 and Rule 1173 (Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants) which meet RACT.
1168	Staff has completed its evaluation and is proposing to reduce primer VOC limits to 250 g/L to meet the CTG. Additional VOC reductions to emissions limits are proposed that will exceed RACT. The Rule is expected to be considered 1st quarter 2015.

All the SCAQMD rules in Tables D-4 through D-8 have been SIP approved except for the following rules (*adoption/last amendment date*): Rules 223 (*5/2/2014*), 444 (*1/9/2009*), 469 (*2/13/1981*), 1110.2 (*10/20/1978*), 1111 (*9/7/2012*), 1112 (*9/5/2014*), 1113 (*6/6/1986*), 1116.1 (*9/9/2011*), 1122 (*11/7/2014*), 1125 (*6/16/2000*), 1130 (*6/16/2000*), 1147 (*7/9/2010*), 1149 (*10/20/2000*), 1153.1 (*5/5/2006*), 1155 (*7/12/2013*), 1166 (*9/6/2013*), 1168 (*5/1/2009*), 1171 (*3/7/2008*), 1183 (*5/2/2014*), 1186.1 (*5/2/2008*), 1191 (*5/11/2001*), 1192 (*1/7/2005*), 1193 (*5/1/2009*), 1194 (*3/12/1993*), 1195 (*6/2/2006*).

TABLE D-4
Evaluation of SCAQMD Particulate Matter (PM) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1105.1	PM	Reduction of PM10 and Ammonia Emissions From Fluid Catalytic Cracking Units (Adopted 11/7/03)	0.005 grain/dscf PM10 and 10 ppmv NH3 slip		Meets RACT
1112.1	PM	Emissions of Particulate Matter from Cement Kilns (Amended 12/4/09)	Applicable to gray cement only. 0.4 lbs PM/tons of kiln feed for kilns rating less than 75 tons per hour; or 30 lbs per hour for kiln rating of 75 tons per hour or more.	Note: Companion Rule 1156 has more stringent PM limit than this rule.	Meets RACT
1133, 1133.1, 1133.2 1133.3	PM	Rule 1133 - Composting and Related Operations – General Administrative Requirements (Adopted 1/10/03) Rule 1133.1 – Chipping and Grinding Activities (Amended 7/8/11) Rule 1133.2 - Emission Reductions from Co-Composting Operations (Adopted January 10, 2003) Rule 1133.3 - Emission Reductions from Greenwaste Composting Operations (Adopted July 8, 2011)	Various performance standards. Air pollution control must have 80% control efficiency or greater. Existing operations must reduce up to 70% baseline VOC and ammonia emissions. Baseline emission factors are 1.78 lbs VOC/ton throughput and 2.93 lbs NH3/ton throughput. Rule 1133.3 establishes operational best management practices (BMPs) for greenwaste composting operations. If the facility processes more than 5,000 tons per year of foodwaste, any active phase of composting containing more than 10% foodwaste, by weight, must use an emission control device with	San Joaquin Rule 4565 – Biosolids, Animal Manure, and Poultry Litter Operations (Adopted 3/15/07) and Rule 4566 – Organic Material Composting Operations (Adopted 8/18/11) have various operational requirements for these operations as well as the operators who landfills, composts, or co-composts these materials. The applicability of Rules 4565/4566 is broader than the applicability of Rule 1133.3. Rules 4565/4566 include additional mitigation measures to control VOC from composting active piles (e.g. maintain minimum oxygen concentration of 5%, moisture content of 40%-70%, carbon to nitrogen ratio of 20-1).	RACT Equivalent. There is no federal policy or guidance describing RACT for this source category. In April 2012, USEPA determined that Rules 1133.1 and 1133.3 fulfill RACT requirements. Rules 1133 and 1133.2 were determined to meet RACT in November 2003. San Joaquin adopted analogous requirements for this source category (Rule 4565) in 2007. SCAQMD Rule 1133.2 is more stringent than San Joaquin's Rule 4565 for larger co-composting

TABLE D-4 *(continued)*
Evaluation of SCAQMD Particulate Matter (PM) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
			an overall control efficiency of at least 80% by weight of VOC.		facilities and less stringent for smaller co-composting facilities. While SCAQMD Rule 1133.2 requires either 70 or 80% overall emission reductions from all parts of composting process, San Joaquin's Rule 4565 requires add-on controls to apply only to the active composting phase. Rule 1133.2 also has more stringent requirements for in-vessel composting. San Joaquin's rule does not address chipping & grinding as in Rule 1133.1. Based on the above information, Rules 1133, 1133.1, 1133.2 and 1133.3 demonstrate RACT equivalency for this source category.

TABLE D-4 *(continued)*
Evaluation of SCAQMD Particulate Matter (PM) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1137	PM	PM10 Reduction From Woodworking Operations (Adopted 2/1/02)	Good housekeeping practices	Rule 1156 contains emission standard for baghouses.	Meets RACT
1138	PM	Control Of Emissions From Restaurant Operations (Adopted 11/14/97)	Require catalytic oxidizer for chain-driven charbroilers. Exemption provided for under-fired charbroilers and units cooking less than 875 lbs/week.	Ventura Rule 74.25 (Adopted 10/12/04) has equivalent requirements as in Rule 1138. Bay Area Rule 2 of Regulation 6 (12/5/07) has emission standards of 0.74 lbs PM10 and 0.32 lbs VOC per thousand pounds of meat cooked for all chain-driven char-broilers; 1.0 lbs PM10 per thousand pounds of meat cooked for all under-fired charbroilers with combined total grill surface area of at least 10 square feet. Most BAAQMD under-fired charbroilers facilities are too small to trigger the under-fired charbroilers requirements.	RACT Equivalent The BAAQMD reported cost-effective values of $17,300/ton of VOC and PM removed for HEPA filters and $19,500/ton of VOC and PM removed for electrostatic precipitators. These cost effectiveness values go beyond RACT.
1140	PM	Abrasive Blasting (Amended 8/2/85)	Visibility standard		Meets RACT
1155	PM	Particulate Matter Control Devices (Amended 5/2/14)	PM standards for PM control devices at 0.01 gr/dcsf for existing large baghouses >7500 square feet. Good operational practices to reduce PM emissions		Meets RACT

TABLE D-4 *(continued)*
Evaluation of SCAQMD Particulate Matter (PM) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1156	PM	PM10 Emission Reductions from Cement Manufacturing Facilities (Amended 3/6/09)	PM standards for PM control devices (0.01 gr/dcsf for existing and 0.005 gr/dcsf for new devices). Good operational practices to reduce PM emissions from aggregate and related operations		Meets RACT
1157	PM	PM10 Emissions Reductions from Aggregate and Related Operations (Amended 9/8/06)	Good operational practices to reduce PM emissions from aggregate and related operations		Meets RACT
1158	PM	Storage, Handling and Transport of Petroleum Coke (Amended 7/11/08)	Reduce PM emissions through good management practices		Meets RACT
1186	PM	PM10 Emissions from Paved and Unpaved Roads, and Livestock Operations (Adopted 7/11/08)	Good management practices		Meets RACT
1186.1	PM	Less Polluting Sweepers (Amended 1/9/09)	Require operators to purchase less polluting or alternative fueled street sweepers.		Meets RACT

TABLE D-4 *(concluded)*
Evaluation of SCAQMD Particulate Matter (PM) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
404, 468, and 469	PM	Rule 404 – Particulate Concentration (Amended 2/7/86) Rule 468 – Sulfur Recovery Units (Amended 10/8/76) Rule 469 – Sulfuric Acid Units (Amended 2/13/81)	PM limits vary from 0.01gr/dscf to 0.19 gr/dscf in Rule 404 depending on exhaust flow rates. Sulfuric acid mist limit in Rule 469 is 0.3 lbs per ton of acid produced (approximately 0.1 gr/dscf) Rule 468 for sulfur recovery units does not contain any PM standard.	Bay Area, Regulation 6, Rule 1 (Adopted 12/5/07) contains the following limits: • PM limit is 0.15 gr/dscf • Sulfuric Acid Manufacturing Plants: limit sulfur trioxide or sulfuric acid mist, or both, expressed as 100% sulfuric acid, to 0.04 gr/dscf • Sulfur Recovery Units: limit sulfur trioxide or sulfuric acid mist, or both, expressed as 100% sulfuric acid, to 0.08 gr/dscf	RACT Equivalent
444	All	Open Burning (Amended 7/12/13)	Contains requirements and prohibitions for open burning to minimize emissions and smoke impacts to the public.	San Joaquin Valley Rule 4103 (Amended 4/15/10) contains additional best management practices compared to Rule 444 such as best management practices to control open burning of weeds. Bay Area, Reg 5, sets requirements for open burning, and was to forbid recreational burning during curtailment periods.	Meets RACT
445	PM	Wood Burning Devices (Amended 5/3/13)	Contains requirements for wood burning devices to minimize emissions and smoke impacts to the public.	San Joaquin Valley Rule 4901 comparable to Rule 445.	Meets RACT

TABLE D-5
Evaluation of SCAQMD Sulfur Oxides (SOx) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1116.1	SOx	Lightering Vessel Operations – Sulfur Content of Bunker Fuel (Adopted 10/20/78)	0.5% sulfur by weight		Meets RACT
1118	All	Refinery Flares (Amended 11/4/05)	• Minimize flare emissions & require smokeless operations • Specify SO2 gradually decreasing performance target to less than 0.5 tons per million barrels of crude by 2012. • If the performance target is exceeded, the operator must 1) pay mitigation fee; or 2) submit a Flare Mitigation Plan to reduce emissions. • Require Cause Analysis for event exceeding 100 lbs VOC, 500 lbs of SO2, or 500,000 scfm of vent gas, excluding planned shutdown, startup and turnarounds • Require 160 ppmv H2S, 3 hour average by 1/1/09, and no limits for NOx, VOC, PM and CO.	U.S. EPA suggested the SCAQMD to further re-evaluate Rule 1118 (FR Vol 76 No 217, Nov 9, 2011, CBE comments). San Joaquin Valley Rule 4311 (Amended 6/18/09) has VOC/NOx limits for ground-level enclosed flares; SO2 Targets (1.50 tons/million barrels of crude by 2011, and 0.5 tons/million barrels by 2012); Flare Minimization Plan for refinery flares more than 5 mmbtu/hr; and operational requirements for all flares that have potential to emit more than 10 tons/yr VOC and more than 10 tons/yr of NOx. Bay Area Rule 12-12 (Adopted 4/5/06) does not specify a declining SO2 target and does not contain a mitigation fee option.	Rule 1118 was determined to be RACT from the 2007 SIP targeting flare emissions from refinery. SJVAPCD Rule 4311 (exempting municipal landfills) applies to other sources > 10 TPY. SCAQMD has a small inventory of flare emissions from sources other than refinery and landfill. Rules 1118 is consistent with SJVAPCD Rule 4311.
1119	SOx	Petroleum Coke Calcining Operations – Oxides of Sulfur (Adopted 3/2/79)	Reduce SOx by 80%		Meets RACT

TABLE D-5 *(continued)*
Evaluation of SCAQMD Sulfur Oxides (SOx) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
2002	SOx	RECLAIM (Amended 11/5/10)	Include facility allocations for SOx for RECLAIM facilities. BARCT Emissions Limits: Calciner, Petroleum Coke • 10 ppmv (0.11 lbs/ton coke) Cement Kiln • 5 ppmv (0.04 lbs/ton clinker) Coal-Fired Boiler • 5 ppmv (95% reduction) Container Glass Melting Furnace • 5 ppmv (0.03 lbs/ton glass) Diesel Combustion • 15 ppmv as required under Rule 431.2 Fluid Catalytic Cracking Unit • 5 ppmv (3.25 lbs/thousand barrels feed) Refinery Boiler/Heater • 40 ppmv (6.76 lbs/mmscft) Sulfur Recovery Units/Tail Gas • 5 ppmv for combusted tail gas (5.28 lbs/hour) Sulfuric Acid Manufacturing • 10 ppmv (0.14 lbs/ton acid produced)	Other Districts do not have RECLAIM. SCAQMD has set most stringent BARCT for SOx sources in the 2010 RECLAIM Amendments.	Exceeds RACT

TABLE D-5 *(concluded)*
Evaluation of SCAQMD Sulfur Oxides (SOx) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
431.1	SOx	Sulfur Content Gaseous Fuels (Amended 6/12/98)	H_2S Limits: Natural gas (16 ppmv) Refinery Gas (40 ppmv) Landfill Gas (150 ppmv) Sewage Gas (40 ppmv) Other Gas (40 ppmv)		Meets RACT
431.2	SOx	Sulfur Content Liquid Fuels (Amended 9/15/2002)	Limit: 15 ppm by weight		Meets RACT
1101	SOx	Secondary Lead Smelters – Sulfur Oxides (Amended 10/7/77)	200 ppmv SOx and 4.2 lbs SOx per ton process weight		Meets RACT
1105	SOx	Fluid Catalytic Cracking Units – Oxides of Sulfur |(Amended 9/1/84)	RECLAIM BARCT limit: Fluid Catalytic Cracking Unit • 5 ppmv (3.25 lbs/thousand barrels feed)	Following the U.S. EPA consent decrees, several refineries in the SCAQMD achieved emission levels as low as 25 ppmv (365 day average) and 50 ppmv (7 day avg) Other Districts do not have RECLAIM. SCAQMD has set most stringent BARCT for SOx sources in the 2010 RECLAIM Amendments	Meets RACT

TABLE D-6
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1109	NOx	Emissions of Oxides of Nitrogen from Boilers and Process Heaters – Petroleum Refineries (Amended 8/5/88)	0.03 lbs/mmBTU of heat input (~25 ppmv). Subsumed by RECLAIM. RECLAIM (amended 1/2005 version) used 5 ppmv for >110 mmbtu/hr and 25 ppmv for units 40-100 mmbtu/hr.	San Joaquin current Rule 4306 limits are 5 ppmv for refinery units > 110 mmbtu/hr, 25 ppmv for units > 65 mmbtu/hr, 30 ppmv for units < 20 mmbtu/hr. For other units, 9 ppmv (or 6 ppmv) for units >20 mmbtu/hr and 15 ppmv (or 9 ppmv) for units from 5-20 mmbtu/hr.	Rule 2002 is currently being evaluated with targeted NOx limits of 2 ppmv for all units > 40 mmbtu.
1110.2	NOx	Emissions from Gaseous and Liquid Fueled Engines (Amended 9/7/12)	Rule 1110.2 has NOx, VOC, CO limits for all stationary and portable engines over 50 brake horse power (bhp). In general, the limits applicable to 1) stationary, non-emergency engines by 7/1/2011, and 2) biogas (landfill and digester gas) engines by 7/1/2012 are: • 11 ppmv NOx • 30 ppmv VOC • 250 ppmv CO	San Joaquin Valley Rule 4702 (Amended 8/19/11) has NOx, VOC, CO and SOx limits for engines rated over 25 bhp. For engines over 50 bhp: - By 1/1/2017, the limits for spark-ignited engines are: • 11 ppmv NOx • 250 ppmv VOC (rich-burn) and 750 ppmv VOC (lean burn), and • 2000 ppmv CO	Meets RACT

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1110.2 (Cont.)	NOx		Limits for new non-emergency engines driving electrical generators are: • 0.07 lbs NOx per MW-hr • 0.20 lbs CO per MW-hr • 0.10 lbs VOC per MW-hr NOx limits for low usage biogas engines: • 36 ppmv, engines ≥ 500 bhp 45 ppmv, engines < 500 bhp VOC and CO limits for low usage biogas engines: • 40 ppmv VOC, landfill gas • 250 ppmv VOC, digester gas • 2000 ppmv CO. Portable and agricultural engines are not subject to the general limits listed above. Many of Rule 1110.2 engines are in RECLAIM, and RECLAIM will be amended to incorporate feasible BARCT.	- Engines used in agricultural operations (AO), or fueled with waste gas, or limited used, or cyclic loaded and field gas fueled are subject to higher limits than the above - In general, all compression ignited engines must meet EPA Tier 4 standards. Engines between 25 bhp - 50 bhp, non agricultural operations (AO), must meet federal standards 40CFR Part 60 Subpart IIII and JJJJ. The SOx limits are: 1) Natural gas, propane, butane, LPG, or combination, or 2) 5 grains/100 scf for gaseous fuel, or 3) 15 ppmv liquid fuel, or 4) CA reformulated gasoline for spark-ignited engines, or 5) CA reformulated diesel for compression ignited engines, or 6) 95% control.	
1111	NOx	NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces (Amended 9/5/14)	40 nanograms per joule heat output until 2015. A lower standard of 14 ng/J is required with staggering compliance dates from 2015-2018.		Meets RACT

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1112	NOx	Emissions of Oxides of Nitrogen from Cement Kilns (Amended 6/6/86)	Applicable to gray cement only. 11.6 lbs/ton clinker averaged over 24 hours and 6.4 lbs/ton clinker averaged over 30 days. Subsumed by RECLAIM. RECLAIM, amended 1/05 version, had no recommendation for cement kiln BARCT. However, RECLAIM BARCT analysis is an on-going process and will be evaluated every three years.	North Central Texas proposes to reduce NOx from cement kilns to 80%-85% using technology such as SCR or LoTOx	Rule 2002 is currently being evaluated with targeted NOx limits of 0.5 lb/ton clinker pulled.
1117	NOx	Emissions of Oxides of Nitrogen from Glass Melting Furnaces (Amended 1/6/84)	4 lb/NOx per ton of glass pulled. Flat glass and fiberglass melting furnaces are exempt. Many of these R1117 units are in RECLAIM. RECLAIM (Amended 1/05 version) had no BARCT recommendation for this class. However, BARCT analysis is an on-going process and will be reevaluated every three years.	San Joaquin Rule 4354 – Glass Melting Furnaces (Amended 8/17/06) have NOx, CO, VOC, SOx limits. For NOx, 4 lb/ton for container glass and fiberglass and 7 lb/ton - 9 lb/ton for flat glass melting furnaces. Since there is a potential to lower the standards through BARCT (e.g. scrubber and SCR), San Joaquin proposes to lower the standards for all glass furnaces in their 2007 AQMP.	Rule 2002 is currently being evaluated with targeted NOx limits of • 0.5 lb/ton container glass pulled, • 1.28 lb/ton glass pulled in a sodium silicate furnace.
1121	NOx	Control of Nitrogen Oxides from Residential Type, Natural-Gas-Fired Water Heaters (Amended 9/3/04)	15 ppmv at 3% O2, dry input (or 10 ng/j output) for all stationary water heaters; and 55 ppmv at 3% O2, dry input (40 ng/j output) for mobile water heaters.	Other Districts' plans propose to accelerate replacements of old water heaters with electric units or new highly-efficient lower-emitting water heaters with the use of incentives.	Meets RACT

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1134	NOx	Emissions of Oxides of Nitrogen from Stationary Gas Turbines (Amended 8/8/97)	Standard = Reference Limit x (Unit Efficiency/25%), where reference limit depends on size of units, varying from 9 ppmv for units rating at equal to or larger than 10MW to 25 ppmv for units rating from 0.3 MW to less than 2.9 MW. RECLAIM, amended 1/2005 version, indicated that 5 ppmv was achieved in practice but not cost effective, therefore did not propose BARCT. This analysis may need to be revised based on new information. RECLAIM BARCT is an on-going process that is planned to be reviewed every 3 years.	Sacramento Rule 413 (Amended 03/24/05) has standards from 9 ppmv – 25 ppmv depending on size of units, but are independent on equipment efficiency. San Joaquin Rule 4703 (Amended 8/17/06) has standards from 5 ppmv – 50 ppmv depending on size of units. Combined cycle units > 10 MW has limit of 3 ppmv. San Joaquin is now proposing to revisit its current rule for further reduction. Ventura Rule 74.9 (Amended 11/08/05) has standards from 25 – 125 ppmv depending on fuel type but are independent from equipment size and efficiency. Control efficiency 90% - 96% control efficiency. In addition, all units have to meet 20 ppmv NH3.	Rule 2002 is currently being evaluated with targeted NOx limits of 2 ppmv for all units.
1135	NOx	Emissions of Oxides of Nitrogen From Electric Power Generating Systems (Amended 7/19/91)	Mass emission limits and emission reduction goals for utility boilers. Only City of Glendale is subject to Rule 1135, which is allowed to meet 0.2 lb/MW-hr (or a daily mass limit of 390 lb NOx per day, or an annual limit of 35 tons per year).	Ventura Rule 59 (amended 7/15/97) requires: • 0.1 lb NOx/MW-Hr for utility boilers and • 0.04 lb/MW-hr for auxiliary boilers. San Joaquin Rule 4306 – Phase 3 (amended 3/17/2005) requires	Rule 2002 is currently being evaluated with targeted NOx limits of 2 ppmv for all units.

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1135 (Cont.)	NOx		Other utility boilers are in RECLAIM subject to declining NOx allocations which were determined based on a level of 7 ppmv (about 0.07 lb/MW-hr assuming a heat rate of 8130 Btu/kw-hr), and are operated at various BARCT levels from 5 ppmv – 30 ppmv.	boilers more than 20 mmbtu/hr to comply with the following options: • Standard option of 9 ppmv (or 0.011 lb/mmbtu) complied by 2005-2007, or • Enhanced option of 6 ppmv (or 0.007 lb/mmbtu) complied by 2006-2008. (Assuming a heat rate of 8130 Btu/kw-hr, 6 ppmv is about 0.06 lb/MW-hr.)	
1146	NOx	Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters (Amended 11/1/2013)	Applicable to units rating of more than 5 mmbtu/hr. Current NOx limits: • For digester gas: 15 ppmv • For landfill gas: 25 ppmv • For refinery gas: 30 ppmv (the 2008 amendment did not revise limits for refinery gas) • For other types of fuels: 5 ppmv for ≥75 mmbtu/hr, natural gas; 30 ppmv for ≥75 mmbtu/hr, other fuels; and 5 or 9 ppmv for 20–75 mmbtu/hr units CO limit: 400ppmv	Sacramento Rule 411 (Amended 10/27/05) limits for gaseous fuel are 9 ppmv for units greater than 20 mmbtu/hr, and 15 ppmv for units from 5 to 20 mmbtu/hr. San Joaquin Rule 4306 (Amended 10/18/08) has the following limits: NOx limits: • 30 ppmv for 5-65 mmbtu/hr units using refinery gas. For units from 40 – 100 mmbtu/hr, refer to the comparison under Rule 1109 • For other types of fuels: 9 ppmv for >20 mmbtu/hr units; 15 ppmv for ≤20 mmbtu/hr units (6 – 9 ppmv for enhanced options) • Other units: 15 – 30 ppmv CO limit: 400 ppmv.	RACT Equivalent

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1146 (Cont.)	NOx		Many Rule 1146 units are in RECLAIM. RECLAIM (Amended 1/05 version) contains the following NOx limits: • For refinery gas: 5 ppmv for units > 110 mmbtu/hr; and 25 ppmv for units < 110 mmbtu/hr units • For other units: 9 ppmv for units > 20 mmbtu/hr; and 12 ppmv for units ≥ 5 mmbtu/hr	San Joaquin Valley further reduces NOx, CO, SO_2 and PM10 emissions by adopting Rule 4320 on 10/16/08. The limits in Rule 4320 are: NOx limits: • For refinery gas: 5 – 6 ppmv for units between 20-110 mmbtu/hr; 6 – 9 ppmv for units between 5 - 20 mmbtu/hr; and 9 ppmv for units firing of less than 50% by vol PUC quality gas. Refer to the comparison under Rule 1109 for 40 mmbtu/hr units and above using refinery gas. • For oil field generators: 5 - 7 ppmv for units greater than 20 mmbtu/hr; 6 – 9 ppmv for units larger than 5 but less than 20 mmtu/hr; and 9 ppmv for units firing of less than 50% by vol PUC quality gas • For low usage units: 9 ppmv • For units at a wastewater treatment facilities firing on less than 50% by vol PUC quality gas: 9 ppmv • For other units: 5 – 7 ppmv for units larger than 20 mmbtu/hr; and 6 – 9 ppmv for units between 5 mmbtu/hr and 20 mmbtu/hr	

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1146 (Cont.)	NOx			Compliance may be mitigated with annual emission fees.	
1146.1	NOx	Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters (Amended 11/1/13)	Applicable to units rating from 2 mmbtu/hr to 5 mmbtu/hr. NOx limits: • Atmospheric Units: 12 ppmv • Digester gas: 15 ppmv • Landfill gas: 25 ppmv • All others: 9 ppmv CO limit: 400 ppmv. Many Rule 1146.1 units are in RECLAIM, and RECLAIM (Amended 1/05 version) BARCT analysis recommended 12 ppmv for less than 5 mmbtu/hr units based on ultra low NOx technology that is achieved in practice. RECLAIM (Amended in 2005) has a limit of 12 ppmv NOx for boilers in this size range.	Bay Area Rule 9-11 (Amended 5/17/00) has following limits for boilers using gaseous fuel 1) 10 ppmv for boilers with rated input greater than 1.75 mmbtu/hr, 2) 25 ppmv for boilers from 1.5-1.75 mmbtu/hr, 3) 30 ppmv for boilers less than 1.5 million btu/hr. Non-gaseous fuel combustion devices have higher limits than gaseous fuel devices. San Joaquin Rule 4307 (Amended 5/19/2011) has the following limits: NOx limits: For New or Replacement Units: Atmospheric Units: 12 ppmv, and Non-Atmospheric Units: 9 ppmv - For Retrofit Units: 30 ppmv burning gaseous fuels; and 40 ppmv burning liquid fuels Sulfur limits for SO2: - For natural gas, propane, butane, or LPG: 5 grains of total sulfur per 100 scf, or 9 ppmv SO2, or 95% control - For liquid fuels: 15 ppmv sulfur	RACT Equivalent

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1146.2	NOx	Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers (Amended 5/5/06)	Applicable to units less than 2 mmbtu/hr. Current limits are: • 20 ppmv for units from 400,000 btu/hr – 2 mmbtu/hr • 55 ppmv for units rating less than 400,000 btu/hr	San Joaquin Valley Rule 4308, (Amended 11/14/13) requires: • 20 ppmv for units used PUC gas from 75,000 btu/hr – 2 mmbtu/hr • 30 ppmv for units from 400,000 btu/hr - 2 mmbtu/hr used other types of fuels • 77 ppmv for units rating from 75,000 btu/hr – 400,000 btu/hr used other types of fuels	Meets RACT
1147	NOx	NOx Emissions from Miscellaneous Sources (Amended 9/9/11)	Current limits are: Gas Fired Equipment: • 60 ppmv for units operating at temperatures ≥ 1200 ^{o} F • 30 or 60 ppmv for units operating at temperatures < 1200 ^{o} F. • 40 ppmv for asphalt Liquid Fuel fired Equipment: • 40 ppmv for units operating at temperatures < 1200 o F • 60 ppmv for units operating at temperatures ≥ 1200 o F • Units less than 1 lb/day compliance delayed until 2017 Mitigation fee option for delayed compliance for multiple units	San Joaquin Valley APCD Rule 4309 (2005) equivalent for asphalt. 40 ppmv for ovens, dehydrators and dryers with no temperature stratification	RACT Equivalent Cooking ovens, dry roasters removed from rule applicability to new Rule 1153.1 (11/7/14) SCAQMD Rule 1147 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1147 is as stringent as or more stringent than the other Districts' rules.

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1153.1	NOx	Emissions of Oxides of Nitrogen from Commercial Food Ovens (Adopted 11/7/14)	• 40 ppmv for units operating at temperatures $< 500^{o}$ F • 60 ppmv for units operating at temperatures $\geq 500^{o}$ F • CO capped at 800 ppmv • Exemption < 1 lb/day and low use sources • 20 year equipment life • Mitigation fee for alternate compliance plan		Meets RACT
1159	NOx	Nitric Acid Units – Oxides of Nitrogen (Amended 12/6/85)	• 450 ppmv 15 min avg, or • 237 ppmv, 60 min avg; or • 3 lbs/ton acid produced, 60 min average.		Meets RACT
1191	All	Light and Medium Duty Fleet Vehicles (Amended 6/16/00)	Require public fleet to acquire new low emitting gasoline or alternative fuel light and medium duty vehicles.		Meets RACT
1192	All	Clean On-Road Transit Buses (Amended 6/16/00)	Require public fleet to acquire new low emitting or alternative fuel heavy duty vehicles.		Meets RACT
1193	All	Clean On-Road Residential /Commercial Refuse Collection Vehicles (Amended 7/9/10)	Acquire new low emitting refuse collection vehicles.		Meets RACT

TABLE D-6 *(concluded)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1194	All	Commercial Airport Ground Access (Amended 10/20/00)	Acquire new low emitting vehicles that are used for passenger transportation in/out airports.		Meets RACT
1195	All	Clean On-Road School Buses (Amended 5/5/06)	Acquire new low emitting school buses.		Meets RACT
2002	NOx,	RECLAIM (Amended 11/5/10)	Include facility allocations for NOx for RECLAIM facilities	Other Districts do not have RECLAIM, refer to individual rules such as Rule 1146, 1146.1, 1110.2 etc.	BARCT review currently underway. Rule Forecast: Second Quarter 2015
444	NOx	Open Burning (Amended 7/12/13)	Contains requirements and prohibitions for open burning to minimize emissions and smoke impacts to the public.	San Joaquin Valley Rule 4103 (Amended 4/15/10) contains additional best management practices compared to Rule 444 such as best management practices to control open burning of weeds.	Meets RACT
445	NOx	Wood Burning Devices (Amended 5/3/13)	Contains requirements for wood burning devices to minimize emissions and smoke impacts to the public. Restrictis burning during the forecasted episodic curtailment periods.	San Joaquin Valley Rule 4901 (Amended 9/18/14) comparable to Rule 445.	Meets RACT

TABLE D-7
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1102	VOC	Petroleum Solvent Dry Cleaners (Amended 11/17/00)	Maximum usage 15 gals per month and various equipment specifications and operating requirements. Exemptions provided for certain types of dry cleaning provided that detergents and additives must be less than 50 g/L VOC.		Meets RACT
1103	VOC	Pharmaceuticals and Cosmetics Manufacturing (Amended 3/12/99)	For reactors, distillation columns, crystallizers, or centrifuges: 15 lbs/day VOC or use surface condensers. For air dryers: 90% control efficiency or 33 lbs/day VOC. Also include other various operating requirements.		Meets RACT
1104	VOC	Wood Flat Stock Coating Operation (Amended 8/13/99)	2.1 lbs/gal, less water and exempt solvent. In lieu of VOC limit, use control device having 95% control efficiency (or 50 ppmv outlet) and 90% collecting efficiency		Meets RACT
1106	VOC	Marine Coating Operations (Amended 1/13/95)	Coating-specific emission limits from 275 – 780 g/L. In lieu of complying with specific emission limits, operator can use air pollution control system with at least 85% efficiency. Solvent cleaning operations must comply with Rule 1171.	Ventura Rule 74.24 (Amended 9/11/12) generally has the same limits as South Coast Rule 1106, except the limit for special marking of items such as flight decks, ship numbers is 420 g/L (490 g/L in Rule 1106)	Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1106 (Cont.)				Bay Area Rule 8-43 (Amended 10/16/02) generally has the same limits as South Coast Rule 1106, except it has lower limit for pretreatment wash primer at 420 g/L (780 g/L in Rule 1106)	
1106.1	VOC	Pleasure Craft Coating Operations (Amended 2/12/99)	Coating-specific emission limits from 340 – 780 g/L. Solvent cleaning operations must comply with Rule 1171.	San Joaquin Valley's Rule 4603 (Amended 9/17/09) limit for teak primer, wood sealer, and clear wood varnish is 420 g/L, which is more stringent than the limits in Rule 1106.1 (i.e. 775 g/L for teak primer, 550 g/L for clear wood sealers, and 490 g/L for clear wood varnishes.)	RACT Equivalent SCAQMD Rule 1106.1 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1106.1 is as stringent as or more stringent than the other Districts' rules.
1107	VOC	Coating of Metal Parts and Products (Amended 1/6/06)	Coating-specific emission limits from 2.3 lbs/gal – 3.5 lbs/gal. In lieu of complying with specific emission limits, operator can use air pollution control system with at least 95% control efficiency (or 5 ppmv outlet) and 90% capture efficiency. Solvent cleaning operations must comply with Rule 1171.	Ventura Rule 74.12 (Amended 4/8/08) generally has the same coating-specific limits as South Coast Rule 1107, except in the following categories: • Limit for metallic coating is 3 lbs/gal (3.5 lbs/gal in Rule 1107); • Limit for camouflage is 3 lbs/gal (3.5 lbs/gal in Rule 1107);	RACT Equivalent SCAQMD Rule 1107 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1107 is as stringent as or more stringent than the other Districts' rules.

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1107 (Cont.)	VOC			• Limit of pretreatment coatings is 2.3 lbs/gal (3.5 lbs/gal in Rule 1107) • Overall minimum control efficiency is 90%, higher than Rule 1107 requirement at 85% San Joaquin Valley Rule 4603 (Amended 9/17/09) have more stringent limits than Rule 1107 for baked camouflage and baked metallic coating at 360 g/L (420 g/L in Rule 1107)	
1108	VOC	Cutback Asphalt (Amended 2/1/85)	0.5% by volume VOC evaporated at 500 degrees F.	Ventura Rule 74.28 – Asphalt Roofing Operations (Adopted 5/10/94) has work practice requirements for asphalt roofing operations. South Coast does not have a similar rule.	Meets RACT
1108.1	VOC	Emulsified Asphalt (Amended 11/4/83)	3% by volume VOC evaporated at 500 degrees F		Meets RACT
1110.2	VOC	Emissions from Gaseous and Liquid Fueled Engines (Amended 9/7/12)	Rule 1110.2 has NOx, VOC, CO limits for all stationary and portable engines over 50 brake horse power (bhp).	San Joaquin Valley Rule 4702 (Amended 11/14/13) has NOx, VOC, CO and SOx limits for engines rated over 25 bhp.	Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1110.2 (Cont.)	VOC		• 11 ppmv NOx • 30 ppmv VOC • 250 ppmv CO Limits for new non-emergency engines driving electrical generators are: • 0.07 lbs NOx per MW-hr • 0.20 lbs CO per MW-hr • 0.10 lbs VOC per MW-hr NOx limits for low usage biogas engines: • 36 ppmv, engines ≥ 500 bhp 45 ppmv, engines < 500 bhp VOC and CO limits for low usage biogas engines: • 40 ppmv VOC, landfill gas • 250 ppmv VOC, digester gas • 2000 ppmv CO. Portable and agricultural engines are not subject to the general limits listed above. Many of Rule 1110.2 engines are in RECLAIM, and RECLAIM will be amended to incorporate feasible BARCT.	• 250 ppmv VOC (rich-burn) and 750 ppmv VOC (lean burn), and • 2000 ppmv CO - Engines used in agricultural operations (AO), or fueled with waste gas, or limited used, or cyclic loaded and field gas fueled are subject to higher limits than the above - In general, all compression ignited engines must meet EPA Tier 4 standards. Engines between 25 bhp - 50 bhp, non agricultural operations (AO), must meet federal standards 40CFR Part 60 Subpart IIII and JJJJ.	

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1113	VOC	Architectural Coatings (Amended 9/6/13)	Coating-specific emission limits from 50 g/L – 730 g/L. Allow averaging, scheduled to be phased out on January 1, 2015. Exempt containers with capacity 2 fluid oz or less.		Meets RACT
1114	VOC	Petroleum Refinery Coking Operations (Adopted 5/3/13)	A delayed coking unit shall depressurize each coke drum to less than two (2) pounds per square inch, gauge (psig) prior to venting it to atmosphere		Meets RACT
1115	VOC	Motor Vehicle Assembly Line Coating Operations (Amended 5/12/95)	Limits from 1.2 lbs VOC/gal coating for electrophoretic primer to 15 lbs/gal of applied solids for primer, primer surfacer and topcoat. Cleaning operations must comply with Rule 1171.	San Joaquin Valley Rule 4602, (Amended 9/17/09) has more stringent limits for: 1) Primer at 0.7 lbs/gal and 2) Primer surface and topcoat at 12 lbs/gal	Rule 1115 is not as stringent as the 2008 EPA CTGs for a few coating processes for facilities emitting > 15 lbs/day. The two facilities subject to Rule 1115 have a small emission inventory of about 0.02 tpd. Staff will commit to further rule evaluation.
1122	VOC	Solvent Degreasers (Amended 5/1/09)	Contain various work practice and design requirements.		Meets RACT
1123	VOC	Refinery Process Turnarounds (Amended 12/7/90)	Vent to storage areas or gas disposal system until pressure in the vessel is below 5 psig or within 5% above the minimum gauge pressure at which the vapors can be collected.	San Joaquin Rule 4454 requires control (vapor recovery and combustion) and depressurization to less than 5 psig. San Joaquin 2007 AQMP control measure proposes to further study the inventory associated with this category.	Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1124	VOC	Aerospace Assembly and Component Manufacturing Operations (Amended 9/21/01)	Coating-specific emission limits from 160 – 1000 g/L. Specific high transfer coating applications (e.g. HVLP spray). In lieu of complying with specific emission limits, operator can use air pollution control system with at least 95% control efficiency (or 50 ppmv outlet) and 90% capture efficiency. Solvent cleaning operations must comply with Rule 1171.	San Joaquin Valley Rule 4605 (Amended 6/16/11) has the following limits that are more stringent than those in Rule 1124: • Flight Test Coatings = 600 g/L (420 g/l for used on missiles and single use target craft, 840 g/L for other flight test coatings in Rule 1124) • Fastener Sealant = 600 g/L (675 g/L for fastener sealant and 600 g/L for other sealants in Rule 1124) Sacramento Rule 456 (Amended 10/23/08) has the following limits that are more stringent than those in Rule 1124: • Conformal Coating = 600 g/L (Rule 1124 limit is 750 g/L) • Fire Resistant Coatings = 600 g/L. (Rule 1124 limits are 650 g/L for Commercial; 800 g/L for Military) • High-Temperature Coating = 420 g/L. (Rule 1124 limit is 850 g/L) • Mold Release Coatings = 762 g/L. (Rule 1124 limit is 780 g/L)	RACT equivalent SCAQMD Rule 1124 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1124 is as stringent as or more stringent than the other Districts' rules.

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1124 (con't)	VOC			• Radiation Effect = 600 g/L. (Rule 1124 limit is 800 g/L) • Rain Erosion Resistant Coating = 600 g/L in All Other Category. (Rule 1124 limit is 800 g/L) SCAQMD Rule 1124 has more detailed breakdown of specialty coating categories (primers, coating, adhesives, sealants, maskants, lubricants, cleaning solvents and strippers) than Sacramento Rule 456. A total of 43 sub-categories (27 in Rule 456) was listed in Rule 1124, and most of them are as stringent as, or more stringent than the analogous requirements in Rule 456. For example, Rule 456's VOC limit is 622 and 160 g/l for Type I and Type II chemical milling maskants (250 and 160 g/l for SCAQMD) and 850 g/l for other maskants (varying from 250 to 850 g/l for different sub-categories in SCAQMD). Ventura Rule 74.13 (Amended 9/11/12) requires 200 g/L VOC limit for solvent cleaning or 25 mmHg vapor pressure allowance.	

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1125	VOC	Metal Container, Closure, and Coil Coating Operations (Amended 3/7/08)	Coating-specific emission limits from 0 g/L (for non food cans) – 660 g/L. Specific high transfer coating applications (e.g. HVLP spray). In lieu of complying with specific emission limits, operator can use air pollution control system with at least 95% control efficiency (or 50 ppmv outlet) and 90% capture efficiency, which is equivalent to an overall control efficiency of 85%. Solvent cleaning operations must comply with Rule 1171.	The following limit in San Joaquin Rule 4604 (Amended 9/20/07) are more stringent than those in Rule 1125: • Two-Piece Interior Body Spray = 420 g/L (440 g/L in Rule 1125) • Three-Piece Interior Body Spray = 360 g/L (510g/L in Rule 1125) In addition, SJV Rule 4604 have many limits that are not listed in Rule 1125 such as 20 g/L for end seal compounds and 225 g/L for two-piece interior sheet base coating and over-vanish. Sacramento Rule 452 (Amended 9/25/2008) has the following more stringent limits than Rule 1125: • Two-Piece Interior Body Spray = 420 g/L (440 g/L in Rule 1125) • Three-Piece Interior Body Spray = 360 g/L (510g/L in Rule 1125)	Meets RACT SCAQMD Rule 1125 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1125 is as stringent as or more stringent than the other Districts' rules. Rule 1125 was amended in 2008 to increase control efficiency of treatment systems to 95%.
1126	VOC	Magnet Wire Coating Operations (Amended 1/13/95)	Coating-specific emission limits less than 200 g/L, or use control equipment to achieve equivalent reduction. Solvent cleaning operations must comply with Rule 1171.		Meets RACT (EPA determination 2007)

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1127	VOC	Emission Reductions from Livestock Waste (Adopted 8/6/04)	Good housekeeping practices. Note: The SCAQMD just adopted Rule 223 in June 2006 to reduce emission for large confined animal facilities. Rule 223 includes series of good management practices that are more stringent than Rule 1127.	Sacramento Rule 496 – Large Confined Animal Facilities (Adopted 8/24/06), has more stringent control and good management practices than South Coast Rule 1127 (e.g. venting to control system with at least 80% control efficiency). In the 2007 AQMP, San Joaquin Valley proposed to increase the number of good management practices and control efficiency as called for in their existing rule.	Meets RACT Rule 1127 and 223 together are as stringent as other Districts' rules.
1128	VOC	Paper, Fabric and Film Coating Operations (Amended 3/8/96)	Coating-specific emission limits from 20 – 265 g/L. Specific high transfer coating applications (e.g. HVLP spray). Alternatively, operator can also use control system with at least 95% control efficiency (or 50 ppmv outlet) and 90% capture efficiency. Solvent cleaning operations must contain 15% or less VOC or 85% VOC must be collected and disposed of.	Midwest RPO proposes 100% capture and 90% - 95% control efficiency for existing sources and 97% for new/reconstructed sources.	RACT equivalent District rule is more stringent than the 2007 EPA CTG. The incremental increase from 85% to 90%-97% in control efficiency is not cost-effective for the existing sources in the South Coast air basin.(note) Note: Per communication with Bill Milner on February 13, 2007.

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION

1130	VOC	Graphic Arts
		(Amended 5/2/14)
			VOC content limits: 16 g/l – 185 g/l for fountain solution, 150 g/l for adhesives, 225 g/l - 300 g/l for inks and coatings. In lieu of meeting specific emission limits, control device with overall control efficiency from 90% - 95% can be used to achieve equal or better emission reductions.
			
			VOC limits for cleaning solutions for printing presses are in Rule 1171 ranging from 25 g/l (0.21 lb/gal) for flexographic printing to 100 g/l (0.83 lb/gal) for lithographic printing (even though 500 g/l is allowed up to end of year 2007.)
			
			Rule 1130 was recently amended to reduce fountain solution VOC content to between 16-85 g/L with optional control device efficiency of 90-95%. The rule meets current CTG specifications.
				The U.S. EPA CTG for lithographic and letterpress, September 2006, recommends:
				
				• Destruction efficiency of 90% to 95% depending on the date of installation (or 20 ppmv VOC outlet concentration) for heat-set web offset presses with potential to emit, prior to controls, of at least 25 tpy.
				
				• For all operations emitting 15 lb/day, requirements for fountain solution are:
				  • 1.6% by weight alcohol or less as applied, or 3% if refrigerated chiller is used, or 5% alcohol substitute for heat-set web presses;
				  • 5% alcohol for sheet-fed presses;
				  • 5% alcohol substitute and no alcohol in fountain solution for cold-set web presses.
					Meets RACT
					
					SCAQMD Rule 1130 was recently amended (05/02/14) and is equivalent to CTG requirements.

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1130 (Cont.)				Bay Area, Regulation 8, Rule 20 (Amended 11/19/08) requires 8% VOC content in fountain solution. In addition, the rule requires recordkeeping for digital printing, cleaning and stripping of UV or electron beam-cured inks for further study potential emission reductions in a near future. Ventura Rule 74.19 (Amended 6/14/11) requires low VOC content in fountain solution used in lithographic presses. In addition, the U.S. EPA CTG for lithographic and letterpress, September 2006, recommends: • Destruction efficiency of 90% to 95% depending on date of installation (or 20 ppmv outlet concentration) for heat-set web with potential to emit, prior to controls, of at least 25 tpy. • For operations emitting 15 lb/day, fountain solution must be 1) 1.6% alcohol or less, or	

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1130 (Cont.)				2) 3% with refrigerated chiller or 3) 5% alcohol substitute for heat-set web presses; 4) 5% alcohol for sheet-fed presses; 5) 5% alcohol substitute and no alcohol in fountain solution for cold-set web presses. The EPA CTG for rotogravure and flexographic, adopted in September 2006, recommends control efficiency of 80% for presses installed after March 1995, and 65% - 75% for older presses.	
1130.1	VOC	Screen Printing Operations (Amended 12/13/96)	VOC content limits ranges from 400 g/L – 800 g/L for materials used in screen printing. In lieu of specific emission limits, control device can be used to achieve equal or better reductions, at least 95%.	Bay Area, Regulation 8, Rule 20 (Amended 11/19/08) has more stringent limit for adhesives at 150 g/L (400 g/L in Rule 1130.1). Sacramento Rule 450 (Amended 10/23/08) has more stringent limits than Rule 1130.1 in the following areas: 1) limit for electronic circuit ink is 800 g/L (850 g/L in Rule 1130.1); 2) limit for adhesives is 150 g/L (400 g/L in Rule 1130.1)	Meets RACT SCAQMD Rule 1130.1 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1130.1 is as stringent as or more stringent than the other Districts' rules.

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1131	VOC	Food Product Manufacturing and Processing Operations (Amended 6/6/03)	VOC content limits from 120 – 200 g/L, or air pollution control system with at least 95% control efficiency and 90% capture efficiency. Solvent cleaning operations must contain 15% or less VOC or 85% VOC must be collected and disposed of.		Meets RACT
1132	VOC	Further Control of VOC from High Emitting Spray Booths (Amended 5/5/06)	Further reduce emissions by 65% from the baseline primarily through the installation of control devices, beyond and above the use of coatings that comply with existing coating rules.		Meets RACT
1133, 1133.1	VOC	Rule 1133 - Composting and Related Operations – General Administrative Requirements (Adopted 1/10/03) Rule 1133.1 – Chipping and Grinding Activities (Amended 7/8/11)	Various performance standards. Air pollution control must have 80% control efficiency or greater. Existing operations must reduce up to 70% baseline VOC and ammonia emissions. Baseline emission factors are 1.78 lbs VOC/ton throughput and 2.93 lbs NH3/ton throughput.		Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1136	VOC	Wood Products Coatings (Amended 6/14/96)	VOC content limits range from 2.3 – 6.3 lbs/gal VOC. Averaging provisions and add-on control are allowed. Transfer efficiency is at least 65%, or operator must use certain type of equipment (e.g. HVLP). Solvent cleaning operations must comply with Rule 1171.	Ventura Rule 74.30 (Amended 6/27/06) has more stringent limit for high-solid stains on new wood products at 2 lbs/gal (2.9 lbs/gal in Rule 1136). In lieu of coating specific limits, control equipment achieving 90% efficiency is required. No averaging provisions in Ventura. Rule 74.30 has higher emissions limits for refinishing operations. San Joaquin Valley Rule 4606 (Amended 10/16/08) is more stringent in the following areas: • Rule 1136 allows the use of a stripper with limits higher than 350 g/L if the stripper has low vapor pressure of 2 mmHg. SJV does not have this allowance; SJV Rule 4606 requires a min overall control efficiency of 85% - 90% for flat wood paneling products, whereas Rule 1136 does not have control efficiency requirement.Rule 4606 exempts refinishing, replacement, and custom Replica Furniture Operations. SCAQMD Rule 1136 also has a VOC limit of 120 g/L for low-stain barrier coat. This category is	RACT Equivalent SCAQMD Rule 1136 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1136 is as stringent as or more stringent than the other Districts' rules.

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1136 (con't)	VOC			not found in SJV/Ventura and it is lower than their general limits. Bay Area, Regulation 8, Rule 32, (Amended 8/5/09) has lower limits for surface preparation and cleanup, including stripping, at 0.21 lbs/gal. Solvent cleaning operations and the storage and disposal of VOC containing materials are subject to Rule 1171 (general limit = 0.21 lbs/gal) in SCAQMD. Bay Area has higher emission limit of clear topcoat (4.6 lbs /gal vs. 2.3 lbs/gal in SCAQMD) for custom furniture Bay Area exempts refinishing, replacement, and custom Replica Furniture Operations.	
1141	VOC	Control of Volatile Organic Compound Emissions from Resin Manufacturing (Amended 11/17/00)	95% - 98% control or 0.12 – 0.5 lbs/1000 lbs of resin produced		Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1141.1	VOC	Coatings and Ink Manufacturing (Amended 11/17/00)	Operational work practices		Meets RACT
1142	VOC	Marine Tank Vessel Operations (Amended 7/19/91)	2 lbs/1000 barrels liquid loaded or 95% emissions reduced		Meets RACT
1141.2	VOC	Surfactant Manufacturing (Amended 1/11/02)	95% control or 0.5 lbs/1000 lbs of surfactant produced		Meets RACT
1143	VOC	Consumer Paint Thinners and Multi-purpose Solvents (Amended 12/3/10)	Set VOC content of 25 g/l for consumer paint thinner and multi-purpose solvent beginning 1/1/2011		Meets RACT
1144	VOC	Metalworking Fluids and Direct-contact Lubricants (Amended 7/9/10)	Various limits from 50 g/L – 340 g/L. Add-on control at 90% capture efficiency, 95% control efficiency (or 5 ppmv outlet)		Meets RACT
1145	VOC	Plastic, Rubber, Leather and Glass Coatings (Amended 12/4/2009)	VOC limits: 50–800 lbs VOC per gallon. Avg provisions and add-on control at 95% control efficiency (50 ppmv outlet), 90% capture efficiency. High transfer coating equipment (e.g. HVLP). Solvent cleaning operations must comply with Rule 1171.		Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1145 (Cont.)			VOC limits: 50–800 lbs VOC per gallon. Avg provisions and add-on control at 95% control efficiency (50 ppmv outlet), 90% capture efficiency. High transfer coating equipment (e.g. HVLP). Solvent cleaning operations must comply with Rule 1171.		
1148	VOC	Thermally Enhanced Oil Recovery Wells (Amended 11/5/82)	4.5 lbs/day or less per well		Meets RACT
1148.1	VOC	Oil and Gas Production Wells (Amended 3/5/04)	• Set limits for total TOC of 500 ppm in well cellar; • Requires well head liquid capture; • limits the storage of organic liquids in the well cellar but conditionally allows TOC emissions with control equipment less than 250 ppm for safety considerations • sets requirement for operations at the well head. • Requires 95% control equipment efficiency for natural gas vented to atmosphere	Glycol dehydrators in gas and oil production regulated by VCAPCD's Rule 71.5 are jointly regulated by SCAQMD Rules 1148.1 and Rule 1173 (Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants) which meet RACT	Rule currently being evaluated for amendments for further VOC reduction. .

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1149	VOC	Storage Tank Degassing (Amended 5/2/08)	Degassing operations must be controlled such that the VOC concentration within the tank is reduced to less than 5,000 ppmv for a minimum time limit estimated in the rule based on volume of the gas to be freed in the tank and the flow rate through control device.	Ventura Rule 74.26, 74.27 (Adopted 10/12/04) requires degassing of crude oil, gasoline and other high TVP liquid storage tanks be controlled by vapor recovery or flare having 95% control efficiency until the vapor concentration in the tanks is less than 10,000 ppmv. Bay Area Rule 8-10 (Adopted 1/21/04) sets requirements for depressurizing process vessels at petroleum refineries and chemical plants. The gases must be vented to control devices until the vapor concentration in the tanks is less than 10,000 ppmv. Rule development is in progress at San Joaquin to eliminate exemptions and require more stringent VOC control.	RACT Equivalent
1150.1	VOC	Control of Gaseous Emissions from Active Landfills (Amended 4/1/11)	98% control or 20 ppmv non methane organic compounds. 50-500 ppmv total organic compounds above background		Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1151	VOC	Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations (Amended 9/5/14)	VOC content limits range from 250 – 840 grams VOC per liter. Averaging provisions are allowed. High transfer coating equipment (e.g. HVLP) is required. Solvent cleaning operations must comply with Rule 1171.	San Joaquin Valley Rule 4602 (Amended 9/17/09) is more stringent in the following areas: 1) adhesive at 250 g/L (540 g/L in Rule 1151) and 2) truck bed liner coating at 200 g/L (310 g/L in Rule 1151) Sacramento Rule 459 (Amended 8/25/11) is more stringent in the following areas: 1) multi-color coating at 520 g/L for mobile equipment driven on rails (680 g/L in Rule 1151), 2) truck bed liner coating at 200 g/L (310 g/L in Rule 1151) Bay Area, Regulation 8, Rule 45 (Amended 12/3/08) is more stringent in the following areas: 1) VOC limit for surface preparation and cleanup, including stripping, of 0.2 lbs/gal or 2) a minimum 85% overall control efficiency.	RACT Equivalent SCAQMD Rule 1151 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1151 is as stringent as or more stringent than other Districts' rules.
1153	VOC	Commercial Bakery Ovens (Adopted 1/13/95)	Emission reduction of 70% or more is required for existing ovens emitting between 50 lbs – 100 lbs VOC/day, 95% or more for ovens emitting more than 100 lbs/day, and 95% or more for new ovens.		Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1162	VOC	Polyester Resin Operations (Amended 7/8/05)	VOC limits (monomer content) from 10-48% by weight or alternatively 90% control efficiency for add-on control	Regulation 8, Rule 50 (Amended 12/2/09) is similar to Rule 1162, except the limit for corrosion resistant resin is more stringent at 40% - 46% (48% in Rule 1162). The rule allows some usage of acetone	RACT Equivalent
1164	VOC	Semiconductor Manufacturing (Amended 1/13/95)	VOC limit for cleanup solvents is 200 g/L or low vapor pressure of 0.64 psia at 68 degree F. Photoresist applications must be vented to control.		Meets RACT
1166	VOC	Volatile Organic Compound Emissions from Decontamination of Soil (Amended 5/11/01)	Good management practices.	Ventura Rule 74.29 – Soil Decontamination Operations (Amended 4/8/08) has standards for soil decontamination (e.g. 50 - 100 ppmv). Leaking agricultural tanks is exempted. Bay Area Rule 8-40 (Amended 6/15/05) for soil decontamination and tank degassing. All vapor exceeding the specified limit based on organic content and aeration rate must be vented to control devices with ≥ 90% efficiency until meeting 5,000 ppmv. San Joaquin Valley Rule 4651 (Amended 9/20/07) employs good management practices similar to those in SCAQMD. For ex-situ decontamination, VOC emissions must be vented to control devices with 95% efficiency or more.	RACT Equivalent There is no federal policy or guidance describing RACT for this source category Rule 1166 is included in the 2007 RACT/RACM demonstration that was approved by USEPA in 2011.

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1168	VOC	Adhesive and Sealant Applications (Amended 1/7/05)	VOC limits for solvents range from 30 – 775 lbs VOC per gallon. Require the use of high transfer efficiency equipment (e.g. HVLP spray). In lieu of meeting the VOC limits, using add-on control with 80% control efficiency is allowed.	San Joaquin Valley Rule 4653 (Amended 9/16/10) has more stringent limits in the following areas: • 100 g/L for Cellulosic Plastic Welding Adhesive, 100 g/L for Styrene Acrylonitrile Welding Adhesive, and 200 g/L for Reinforced Plastic Composite Adhesive (Rule 1168 limit is 250 g/L limits for all three categories) • Minimum overall control efficiency is 85% (80% in Rule 1168)	Staff has completed its evaluation and is proposing to reduce primer VOC limits to 250 g/L to meet the CTG.
1171	VOC	Solvent Cleaning Operations (Amended 5/1/09)	VOC limits for solvents are 25 g/L in general, and have a 100-800 g/L VOC for specific cleaning operations. In lieu of meeting the VOC limits, add-on control having 90% collection efficiency and 95% destruction efficiency or meeting 50 ppmv outlet concentration can be used.	The U.S. EPA RACT published in September 2006 limit is 50 g/L or an overall control efficiency of 85%. The U.S. EPA is not recommending limits beyond 50 g/L; but also recommends states to adopt higher limits based on individual performance requirements of specific applications.	Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION

1173	VOC	Fugitive Emissions of Volatile Organic Compounds (Amended 2/6/09)	• Require to connect atmospheric PRDs to vapor recovery or add-on control by first turnaround, if the facility experiences:
			  • a second release of more than 500 lbs VOC within any five year period, or
			  • any release of 2,000 lbs VOC in any 24 hour period.
			In lieu of connecting PRDs to control, operator may elect to pay mitigation fee of $350,000 for any release exceeding the threshold.
			• Leak Detection and Repair (LDAR) program to reduce fugitive emissions. Leak thresholds are:
			  • for light liquid/gas/vapor service >10,000 ppmv,
			  • for PRDs >200 ppmv,
			  • for pumps in heavy liquid >100 ppmv
				Bay Area Rule 8-28 (amended 12/21/05) requires atmospheric PRDs to be:
				• vented to vapor recovery or equivalent control devices that have 95% control efficiency within one year of the second release event of greater than 10 lbs VOC.
				• equipped with at least two or three redundant preventive measures to minimize episodic releases, and
				• equipped with tell-tale indicators.
				
				North Central Texas – Final 2007 SIP, Oil & Gas Production, Natural Gas Processing, Measure #144. Propose to revise leak definitions and requirements for shorter repair periods based on recently revised San Joaquin Valley Rule 4409, amended July 2004.
					Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1174	VOC	Control of Volatile Organic Compound Emissions from the Ignition of Barbecue Charcoal (Amended 10/5/90)	VOC emissions less than 0.02 lb VOC per start.		Meets RACT
1175	VOC	Control of Emissions from the Manufacture of Polymeric Cellular (Foam) Products (Amended 11/5/10)	VOC limit for expandable polystyrene molding operations is less than 2.4 lbs/100 lbs of raw material processed		Meets RACT
1176	VOC	Sumps and Wastewater Separators (Amended 9/13/96)	• Wastewater: 500 ppmv • Sumps and wastewater separators must have floating cover with seals; or fixed cover vented to control • Sewer lines: totally enclosed • Process drains: with SCAQMD approved water seals • Junction boxes: totally enclosed • Control device: ≥ 95% efficiency or ≤500 ppmv leak above background • Monthly to annually inspection	Bay Area Rule 8-8 (Amended 9/15/04) in general is similar to South Coast Rule 1176, with the following exceptions: • Floating covers must have double seals; and • Semi-annual inspection is allowed. In their 2007 AQMP, San Joaquin Valley proposes to further study the following areas: • Require crude oil production sumps to have fixed roof and vented to control with 99% control efficiency; • Require wastewater separators to have fixed roof and vented to control with 95% control efficiency, and • Require floating roofs to be equipped with double seals	Meets RACT

TABLE D-7 *(concluded)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1177	VOC	Liquefied Petroleum Gas Transfer and Dispensing (Adopted 6/1/12)	The rule specifies tightened connectors (valves and seals) for vapor and liquid transfer from storage tanks to cargo tanks to minimize leakage.		Meets RACT
1178	VOC	Further Reductions of VOC Emissions From Storage Tanks at Petroleum Facilities (Amended 4/7/06)	Applicable to high emitting facility that has 20 tpy VOC emissions or more and tanks >19,815 gals with liquids having TVP > 0.1 psia. Rule 1178 requires doming for high emitting external floating roof tanks, better seals and better control for all tanks. (Note that Rule 463 is applicable for tanks >19,815 gals at all facilities and have requirements for fixed roof tanks and floating roof tanks.)	In the 2007 AQMP, San Joaquin proposes to revise Rule 4623 to lower tank capacity applicability, lower TVP threshold, and revisit exemptions to broaden source applicability. Midwest RPO control measure proposes to expand source applicability of LADCO state rules to include 10,000 gal tanks.	Meets RACT
1179	VOC	Publicly Owned Treatment Works Operations (Amended 3/6/92)	Include recordkeeping requirements.		Meets RACT
1183	VOC	Outer Continental Shelf (OCS) Air Regulations (Adopted 3/12/93)	Adopt by reference Code of Federal, Part 55, Title 40.		Meets RACT
1189	VOC	Emissions From Hydrogen Plant Process Vents (Adopted 1/21/00)	For existing plants, 2.5 lbs VOC per million cubic feet of hydrogen produced. For new plants, 0.5 lbs VOC per million cubic feet of hydrogen produced.		Meets RACT

TABLE D-8
Evaluation of SCAQMD Ammonia (NH_3) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
223	NH3	Emissions Reduction Permits From Large Confined Animal Facilities (Adopted 6/2/06)	Sets permit requirement for new and modified LCAF facilities. Specifics mitigation options by animal and facility type for: • Feed and silage handling, • Milk parlor operations, • Corrals and free stall barn operations, • Handling of manure and solids, • Handling of manure in liquid form • Land application of liquid or solid manure	SJVAPCD Rule 4570 sets comparable permit requirements and mitigation measures.	Rule 223 meets RACT through its implementation of technically feasible mitigation measures. The focus of the SJVAPCD rule is not applicable in the Basin for dry feed operations.
1105.1	NH3	Reduction of PM10 and Ammonia Emissions From Fluid Catalytic Cracking Units (Adopted 11/7/03)	0.005 grain/dscf PM10 and 10 ppmv NH3 slip		RACT Equivalent
1127	NH3	Emission Reductions from Livestock Waste (Adopted 8/6/04)	Set protocol for dairy farm manure removal and processing and sets alternate planning requirements for manure composting	SJVAPCD Rule 4565 and 4566 sets comparable permit requirements and mitigation measures.	RACT Equivalent

TABLE D-8 *(continued)*
Evaluation of SCAQMD Ammonia (NH_3) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1133.2	NH3	Emission Reductions from Co-Composting Operations (Adopted 1/10/03)	Various performance standards. Air pollution control must have 80% control efficiency or greater. Existing operations must reduce up to 70% baseline VOC and ammonia emissions. Baseline emission factors are 1.78 lbs VOC/ton throughput and 2.93 lbs NH3/ton throughput.	San Joaquin Rule 4565 – Biosolids, Animal Manure, and Poultry Litter Operations (Adopted 3/15/07) and Rule 4566 – Organic Material Composting Operations (Adopted 8/18/11) have various operational requirements for these operations as well as the operators who landfills, composts, or co-composts these materials. The applicability of Rules 4565/4566 is broader than the applicability of Rule 1133.3. In addition, Rules 4565/4566 include additional mitigation measures to control VOC from composting active piles (e.g. maintain minimum oxygen concentration of 5%, moisture content of 40%-70%, carbon to nitrogen ratio of 20-1). San Joaquin's rule does not address chipping & grinding as in Rule 1133.1.	RACT Equivalent SCAQMD Rule 1133.2 is more stringent than San Joaquin's Rule 4565 for larger co-composting facilities and less stringent for smaller co-composting facilities. While SCAQMD Rule 1133.2 requires either 70 or 80% overall emission reductions from all parts of composting process, San Joaquin's Rule 4565 requires add-on controls to apply only to the active composting phase. Rule 1133.2 also has more stringent requirements for in-vessel composting.

TABLE D-8 *(concluded)*
Evaluation of SCAQMD Ammonia (NH_3) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1133.3	NH_3	Emission Reductions from Greenwaste Composting Operations (Adopted 7/8/11)	Include requirements for composting greenwaste, or greenwaste in combination of manure or foodwaste. Include various performance standards. Require air pollution control with efficiency of 80% or greater for operations greater than 5000 tons/year of foodwaste. For operations less than 5000 tons/year, require the composting piles to be covered, watered, and turned, or operated with measures that reduce at least 40% VOC emission and 20% NH_3 emissions.		RACT Equivalent

ATTACHMENT E

CLEAN AIR ACT, SUBPART 4, SECTION 189(E) AND OTHER PRECURSOR REQUIREMENTS

BACKGROUND

PM2.5 has four major precursors, other than direct PM2.5 emissions, that may contribute to the development of the ambient PM2.5: ammonia, NOx, SOx, and VOC. The 2012 AQMP modeling analysis resulted in a set of ratios that reflect the relative amounts of ambient PM2.5 improvements expected from reductions of PM2.5 precursors emissions. For instance, Table 5-2 in Chapter 5 of the 2012 AQMP demonstrates that one ton of VOC emission reductions is only 30 percent as effective as one ton of NOx for lowering 24-hour PM2.5 concentrations. VOC reductions are only four percent and two percent as effective as SOx and direct PM2.5 reductions, respectively, on a per ton basis. Thus, VOC controls have a much less significant impact on ambient 24-hour PM2.5 levels relative to other PM2.5 precursors.

EMISSIONS CONTRIBUTION

While similar relative contributions to PM2.5 have not been developed for ammonia, the mass contributions of ammonium sulfate and ammonium nitrate are accounted for in the SOx and NOx contributions. This essentially assumes that PM2.5 formation in the basin is not ammonia limited with sufficient ammonia in the atmosphere to combine with available nitrates and sulfates. Under these conditions, ammonia controls are much less effective at reducing ambient PM2.5 levels than other precursors.

While the 2012 AQMP ammonia emissions inventory was close to 100 ton per day (TPD), the inventory was highly variable in terms of source contributions and spatial distribution throughout the Basin. As presented in Table E-1, major sources accounted for 1.7 TPD or less than 2 percent of the Basin inventory. Furthermore, only four major source emitters were noted in the inventory with the single highest major source accounting for less than 0.50 TPD direct emissions. All four major sources are located in the western Basin.

TABLE E-1

VOC and Ammonia Emissions Contributions

POLLUTANT	ALL SOURCES *(Tons Per Day)*	MAJOR SOURCES *(Tons Per Day)*	RELATIVE CONTRIBUTION
VOC	451[1]	8.0[2]	1.8%
Ammonia	99[3]	1.7[2]	1.7%

[1] 2012 AQMP - Appendix III: Base and Future Year Emission Inventory; 2014 Annual Average Emissions by Source Category in South Coast Air Basin

[2] 2013 SCAQMD Annual Emission Reporting

[3] ARB Almanac 2013 – Appendix B: County Level Emissions and Air Quality by Air Basin; County Emission Trends

Prior to the 2003 AQMP, significant effort was undertaken to develop inter-pollutant trading ratios to meet NSR emissions reduction goals. The primary mechanism was to reduce SOx to offset PM emissions. Aerosol chemical mechanisms embedded in box and regional modeling platforms where used to estimate the formation rates of ammonium sulfate from local sulfur emissions to establish a SOx emissions to PM formation ratio. The analyses determined that the influence of ammonia emissions was spatially varying where coastal-metro zone (west Basin) trading ratios of SOX to PM valued more than 5:1 per unit SOx emissions to PM. Conversely, eastern Basin ratios valued 1:1 since ammonia emissions were abundant and all SOx emissions were likely to rapidly transform to particulate ammonium sulfate. The inter-pollutant trades made during this time were reviewed by U.S. EPA and were included by reference to the EPA sponsored Inter-Pollutant Trading Working Group[4].

As part of the controls strategy evaluation for future PM2.5 attainment, additional set of analyses were conducted to test the potential impact of the use of SCR as a NOx control mechanism for mobile sources in the Basin. The analyses assumed that light as well as heavy duty diesels would use the control equipment potentially resulting in a 78-85 percent increase in ammonia from those source categories. The results of the analysis, presented at the September 24, 2010 SCAQMD Mobile Source Committee Meeting[5], indicated that a 10 TPD increase in ammonia would result in a net 0.22 $\mu g/m^3$ increase in regional PM2.5 concentrations. The emissions mostly followed heavy traffic corridors including freeways and major arterials. Regardless, the minimal PM2.5 simulated increase from a 10 percent increase in the Basin inventory reflected the degree of saturation of ammonia in the Basin and minimal sensitivity of changes in ammonia emissions to PM2.5 production.

During the development of the 2012 AQMP, a sensitivity analysis was conducted to test the potential impact of using a feed supplement applied to dairy cows on a forecasted basis that would reduce bovine ammonia emissions by 50 percent. The analysis focused on the Mira Loma area where more than 70 percent of the Basin's dairy emissions originate. In the sensitivity analysis a total of 2.9 TPD emissions were reduced from 103 dairy sources, or an average of 0.028 TPD per source (roughly one tenth of major source threshold)[6]. Since the Mira Loma monitoring station was embedded among the dairy sources, the reduction of the ground level emissions resulted in an approximate 0.16 $\mu g/m^3$ reduction in PM2.5. As in the aforementioned analyses, the reduction in regional ammonia emissions resulted in a minimal PM2.5 impact per ton emissions reduced.

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and Forecasts 2012 Emissions. NOTE: 2012 AQMP – Appendix III provides 2014 Annual Average of 102 tpd of NH3; the relative contribution would not change (1.7/102 = 1.7%)

[4] "Preliminary Assessment of Methods for Determining Interpollutant Offsets", Correspondence with Scott Bohning U.S. EPA Region IX, May 6, 2002.

[5] "Impact of Higher On- and Off-road Ammonia Emissions on Regional PM2.5," Item 3, SCAQMD, Mobile Source Committee, September 24, 2010.

[6] "2008 24-hour PM2.5 Model Performance/Preliminary Attainment Demonstration," Item #2, Scientific Technical Modeling Peer Group Advisory Committee, June 14, 2012.

Thus, ammonia controls also have a much less significant impact on 24-hour PM2.5 exceedances than other precursors. Note however, that the effect on annual PM2.5 levels will be further evaluated in the 2016 AQMP.

SECTION 189(E)

Clean Air Act (CAA), Title I, Part D, Subpart 4, Section 189(e) states that control requirements applicable to plans in effect for major stationary PM sources shall also apply to major stationary sources of PM precursors, except where such sources does not contribute significantly to PM levels which exceed the standard in the area. According to the U.S. EPA, a major source in a nonattainment area is a source with emission of any one air pollutant greater than or equal to the major source thresholds in a nonattainment area. This threshold is generally 100 tons per year (tpy) or lower depending on the nonattainment severity for all sources. Emissions are based on "potential to emit" and include the effect of add-on emission control technology, if enforceable (*must be able to show continual compliance with the limitation or requirement*).

Major stationary sources of NOx and SOx are already subject to emission offsets (e.g., Regulation XX (RECLAIM) and Regulation XII (New Source Review)). Thus, to demonstrate compliance with CAA Subpart 4, Section 189(e), an analysis was conducted of the emissions of VOC and ammonia from major stationary sources during rule development of amended Rule 1325 (*Federal PM2.5 New Source Review Program*) approved by the SCAQMD Governing Board on December 5, 2014 (http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2014/2014-dec5-038.pdf?sfvrsn=2). That analysis concluded that VOC and ammonia from major sources (emitting 100 tpy or greater) contribute less than 2% of the overall Basin-wide VOC and ammonia emissions (Table E-1), and by extension, do not contribute significantly to PM levels. Furthermore, both VOC and ammonia are subject to requirements for Best Available Control Technology (BACT) under existing New Source Review (NSR) at a zero threshold, so those emission will still be minimized. This analysis was also included in the final approved staff report for PAR 1325.

NEW SOURCE REVIEW

Because ammonia from major stationary sources does not significantly contribute to PM levels (see Table E-1), ammonia emission sources have not historically been subject to NSR offset requirements. However, for permitted ammonia sources, SCAQMD Rule 1303 (*NSR Requirements)* requires denial of "the Permit to Construct for any relocation, or for any new or modified source which results in an emission increase of any nonattainment air contaminant, any ozone depleting compound, or ammonia, unless BACT is employed for the new or relocated source or for the actual modification to an existing source." No new major stationary source of ammonia is expected to be introduced to the region given that these new sources would be

subject to BACT requirements (under SCAQMD Rule 1303 (*NSR Requirements*), BACT shall be at least as stringent as Lowest Achievable Emissions Rate (LAER) as defined in the federal Clean Air Act Section 171(3) [42 U.S.C. Section 7501(3)]). As mentioned above, there are currently only four major sources of ammonia (emitting more than 100 tons per year) in the South Coast Air Basin. If these sources were new to the region, they would be subject to BACT as stringent as LAER and not expected to reach 100 tons per year so as to be classified as a major source, thus not subject to NSR offset requirements.

However unlikely, even if new or modified major sources of ammonia increase ammonia emissions in the Basin, the ammonia contribution from major sources in the South Coast Air Basin will still not be a significant contributor to PM2.5 levels given that all current major sources of ammonia account for less than two percent of the overall ammonia emissions inventory. For instance, in the extremely unlikely event that ammonia emissions from major sources double, they would still contribute less than five percent of the overall ammonia inventory.

ATTACHMENT F

UPDATED LIST OF CONTROL STRATEGY COMMITMENTS

UPDATE OF COMMITMENTS

The short-term PM2.5 control measures in the 2012 AQMP included stationary source control measures, technology assessments, an indirect source measure and one education and outreach measure. The development of the control measures considered the emissions reductions and the adoption and implementation dates that would result in attainment of the 2006 24-hour PM2.5 standard of 35 $\mu g/m^3$. In some cases, only a range of possible emissions reductions could be determined, and for some others, the magnitude of potential reductions could not be determined at that time. The short-term PM2.5 control measures were presented in Table 4-2 (Chapter 4) of the 2012 AQMP, and the following table, Table F-1 updates that information, thus replacing Table 4-2 in the 2012 AQMP for inclusion in the 24-hour PM2.5 SIP. Note that these changes do not affect the magnitude or timing of emission reductions commitments supporting the attainment demonstration in the 2012 AQMP and this Supplement. The emission reduction commitment for CMB-01 (Further NOx Reductions from RECLAIM) was as a contingency measure only for PM2.5, and thus does not affect the attainment demonstrations.

The measures target a variety of source categories: Combustion Sources (CMB), PM Sources (BCM), Indirect Sources (IND), Educational Programs (EDU) and Multiple Component Sources (MCS).

Two PM2.5 control measures, BCM-01 (Further Reductions from Residential Wood Burning Devices) and BCM-02 (Further Reductions from Open Burning), were adopted in 2013 in the form of amendments to Rules 445 (Wood Burning Devices) and 444 (Open Burning), respectively. Together, these amendments generated a total of 11.7 tons of PM2.5 per day reductions on an episodic basis. Control measure CMB-01 (Further NOx Reductions from RECLAIM), which was submitted as a contingency measure, is anticipated to be considered by the SCAQMD Governing Board in the first half of 2015. The rulemaking process for control measure IND-01 (Backstop Measure for Indirect Sources of Emissions from Ports and Port-Related Facilities) is underway, with anticipated SCAQMD Governing Board consideration in 2015 and the technology assessment for control measure BCM-04 (Further Ammonia Reductions from Livestock Waste) will now be adopted in the 2015 to 2016 timeframe with rulemaking to follow, if technically feasible and cost-effective. The BCM-03 (Emission Reductions from Under-Fired Charbroilers) technology assessment is ongoing and is expected to be completed by 2015 with rule development to follow by 2017.

Pursuant to CAA Section 172(c)(9), SIPs are required to include contingency measures to be undertaken if the area fails to make reasonable further progress or attain the NAAQS by the attainment date. The contingency measures "should provide for emission reductions equivalent to about one year of reductions needed for reasonable further progress (RFP)" (79 FR 20642-20645) The 2012 AQMP relied on excess air quality improvement from the control strategy as well as potential NOx reductions from control measure CMB-01 (Further NOx Reductions from

RECLAIM) to demonstrate compliance with the federal requirement. No additional contingency measure commitment is being proposed in this Supplement.

TABLE F-1

Updated 2012 SIP Emission Reduction Commitments to Attain 24-hour PM2.5 NAAQS *(35 µg/m^3)*

Control Measure #	CONTROL MEASURE TITLE	2012 AQMP			PROPOSED in SUPPLEMENT		
		Adoption Date	COMMITMENT	ACHIEVED	Adoption Date	COMMITMENT	ACHIEVED
			2014	2014		2015	2015
PM2.5 EMISSIONS							
IND-01	Backstop Measures for Indirect Sources of Emissions from Ports and Port-Related Facilities [R4001]	2013	N/A[1]	N/A[1]	**2015**	N/A[1]	N/A[1]
BCM-01	Further Reductions from Residential Wood Burning Devices [R445]	2013	7.1	7.1	2013	7.1	7.1
BCM-02	Further Reductions from Open Burning [R444]	2013	4.6	4.6	2013	4.6	4.6
MCS-01	Application of All Feasible Measures Assessment	Ongoing	TBD[2]	TBD	Ongoing	TBD[2]	TBD
BCM-03	Emission Reductions from Under-Fired Charbroilers [R1138]	2015	TBD[3]	TBD	**2017**	TBD[3]	TBD
EDU-01	Further Criteria Pollutant Reductions from Education, Outreach and Incentives	Ongoing	N/A[4]	N/A	Ongoing	N/A[4]	N/A
TOTAL PM2.5 EMISSION REDUCTIONS (TPD)			**11.7**	**11.7**	**--**	**11.7**	**11.7**
NOx EMISSIONS							
CMB-01	Further NOx Reductions from RECLAIM [Reg XX]	2013	2.0[5]	--	**2015**	2.0[5]	--
IND-01	Backstop Measures for Indirect Sources of Emissions from Ports and Port-Related Facilities [R4001]	2013	N/A[1]	N/A[1]	**2015**	N/A[1]	N/A[1]
TOTAL NOx EMISSION REDUCTIONS (TPD)			**2.0**	**--**	**--**	**2.0**	**--**
SOx EMISSIONS							
IND-01	Backstop Measures for Indirect Sources of Emissions from Ports and Port-Related Facilities [R4001]	2013	N/A[1]	N/A[1]	**2015**	N/A[1]	N/A[1]
TOTAL SOx EMISSION REDUCTIONS (TPD)			**--**	**N/A[1]**	**--**	**--**	**N/A[1]**
NH3 EMISSIONS							
BCM-04	Further Ammonia Reductions from Livestock Waste [R1127] - Phase I (*Tech Assessment*)	2013-2014	TBD[2]	TBD	**2015 - 2016**	TBD[2]	TBD
	-Phase II (*Rule Amendment*)	TBD	TBD[2]	TBD	TBD	TBD[2]	TBD
TOTAL NH3 EMISSION REDUCTIONS (TPD)			TBD	TBD	--	--	--

[1] Measure is designed to ensure reductions assumed to occur will in fact occur
[2] Reductions to be determined once the technical assessment is complete, and inventory and control approach are identified
[3] Will submit into SIP once technically feasible and cost effective options are identified
[4] Reductions cannot be quantified due to the nature of the measure (e.g., outreach, incentive programs)
[5] Emission reductions are included in the SIP as a contingency measure, if triggered