

## Chapter 4

# Control Strategy and Implementation

South Coast Air Quality Management District  
*Cleaning the air that we breathe...™*



## **CHAPTER 4**

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# **CONTROL STRATEGY AND IMPLEMENTATION**

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## **INTRODUCTION**

The overall control strategy in the Final 2012 AQMP provides a path to achieving emission reductions and air quality goals. Implementation of the Final 2012 AQMP will be based on a series of control measures and strategies that vary by source type (i.e., stationary or mobile) as well as by the pollutant that is being targeted. Although great strides have been made in air pollution control technologies and emission reduction programs, air quality goals cannot be achieved without significant further emission reductions. The 2012 AQMP is designed to achieve the 2006 24-hour PM<sub>2.5</sub> standard by 2014. In addition, the sheer magnitude of emission reductions needed for the attainment of the 8-hour ozone national ambient air quality standards (NAAQS) by 2023 and 2032 poses a tremendous challenge to the South Coast Air Basin. This challenge requires an aggressive control strategy and close collaboration with federal, state, and regional governments, local agencies, businesses, and the public. This chapter outlines the proposed control strategy and implementation schedule for the Final 2012 AQMP as required to achieve the air quality goals in the Basin.

## **OVERALL ATTAINMENT STRATEGY**

The overall control strategy for this Plan is designed to meet applicable federal and state requirements, including attainment of ambient air quality standards. The focus of the Final 2012 AQMP is to demonstrate attainment of the federal 2006 24-hour PM<sub>2.5</sub> ambient air quality standard by the 2014 attainment date, as well as an update to further define measures to meet the federal and state 8-hour ozone standards. The attainment demonstration for the new 8-hour ozone standard (75 ppb) will be addressed in the 2015 ozone plan.

The Final 2012 AQMP provides base year emissions and future baseline emission projections (see Chapter 3 and Appendix III). In doing so, the Final 2012 AQMP relies upon the most recent planning assumptions and the best available information including: CARB's latest emission factors (EMFAC2011) for the on-road mobile source emissions inventory; CARB's 2011 in-use fleet inventory for the off-road mobile source emission inventory; the latest point source inventory; updated area source inventories; and SCAG's forecast growth assumptions based on its recent 2012 Regional Transportation Plan. The baseline emission projections provide a snapshot of the future air quality conditions, including the effects from already adopted rules and regulations, but without a proposed control strategy.

Air quality modeling (see Chapter 5 and Appendix V) is conducted to determine the Basin’s “carrying capacity,” which is the allowable level of emissions to meet the standards. The remaining emissions above the carrying capacity are the amount of emissions that must be reduced in order to achieve the standards. To meet the targeted carrying capacity emissions level, a control strategy has been developed.

The development of the control strategy entails integrated planning to identify, to the extent feasible, co-benefit opportunities in achieving multi-pollutant reductions to meet standards with multiple deadlines. As such, control measures for attainment of one pollutant standard can assist in the attainment of another pollutant standard. For example, some control measures chosen to reduce criteria pollutants can also result in the reduction of greenhouse gases (GHG) and/or toxic emissions. In doing so, implementation of the Final 2012 AQMP control strategy could also assist in reaching the GHG target goals in the AB32 Scoping Plan or the air quality goals in CARB’s Freight Transport Plan.

The control measures were chosen based on technical and economic feasibility, as well as other factors such as promoting fair share responsibility and maximizing private/public partnerships. Table 4-1 provides an overview of the criteria used in evaluating and selecting feasible control measures, in no particular order.

**TABLE 4-1**

Criteria for Evaluating 2012 AQMP Control Measures (not ranked by priority)

<b>CRITERIA</b>	<b>DESCRIPTION</b>
Cost-Effectiveness	The cost of a control measure to reduce air pollution by one ton [cost includes purchasing, installing, operating and maintaining the control technology].
Emission Reduction Potential	The total amount of pollution that a control measure can actually reduce.
Enforceability	The ability to ensure that polluters comply with a control measure.
Legal Authority	Ability of the District or other adopting agency to implement the measure or the likelihood that local governments and agencies will cooperate to approve a control measure.
Public Acceptability	The likelihood that the public will cooperate in the implementation of a control measure that applies to members of the public.
Rate of Emission Reduction	The time it will take for a control measure to reduce a certain amount of air pollution.
Technological Feasibility	The likelihood that the technology for a control measure will be available as anticipated.

For the Final 2012 AQMP control measure development, District staff conducted an AQMP Technology Symposium in September 2011 to solicit new control concepts and innovative ideas from industry experts, professional consultants, and government specialists. Internal staff suggestions and external recommendations assisted in identifying additional control measures and assessing control measure feasibility. Since the adoption of the 2007 AQMP, the District has made significant strides in achieving further emission reductions from stationary sources. Table 1-2 in Chapter 1 provides a list of rules adopted by the District since adoption of the 2007 AQMP as well as the SIP commitment and the emission reductions achieved for each rule. The proposed control strategy in the Final 2012 AQMP includes some revised and partially implemented measures from the 2007 AQMP, and new measures deemed feasible and necessary to provide additional control opportunities to achieve the air quality standards.

The Final 2012 AQMP is proposing a control strategy that includes emission reductions from both stationary and mobile sources. The proposed stationary source control measures in the Final 2012 AQMP are based on implementation of all feasible control measures through the application of available cleaner technologies, best management practices, incentive programs, as well as development and implementation of zero- and near-zero technologies and control methods. The stationary source control measures presented in the Plan are proposed to further reduce emissions from both point sources (permitted facilities) and area sources (generally small and non-permitted) in addition to smaller permitted sources with emissions less than the reporting threshold in the District's Annual Emissions Reporting Program). The basic principles followed in developing the District's stationary source control measures include: 1) identify PM<sub>2.5</sub>, ammonia and/or NO<sub>x</sub> reduction opportunities and maximize reductions by the 2014 attainment date, and 2) initiate programs or rule making activities for VOC and further NO<sub>x</sub> control strategies aiming at maximum reductions by the 2023 timeframe to further implement the ozone plan for the 1997 8-hour ozone standard.

The mobile source strategy includes actions seeking further emission reductions from both on-road and off-road mobile sources, such as accelerated penetration of zero- and near-zero emission vehicles and early retirement of older vehicles. In addition, the mobile source strategy includes research and development of advanced control technologies from various mobile sources. Some of the proposed actions need to be implemented by several agencies that currently have the statutory authority to

implement such measures. For more details about the responsibilities of the other agencies, refer to the last section of this chapter under Implementation.

The Final 2012 AQMP relies on a comprehensive and integrated control approach aimed at achieving the 2006 24-hour PM<sub>2.5</sub> standard by the 2014 attainment date through implementation of short-term 24-hour PM<sub>2.5</sub> control measures. For each control measure, the District will seek to achieve the maximum reduction potential that is technically feasible and cost-effective. The overall control strategy provides for attainment of the 2006 24-hour PM<sub>2.5</sub> standard, with additional ozone measures to further implement the ozone plan for the 8-hour ozone standard.

The following sections provide an overview of the two-part control strategy.

### **24-Hour PM<sub>2.5</sub> Strategy**

In December 2009, the U.S. EPA designated the Basin as nonattainment for the 2006 24-hour PM<sub>2.5</sub> NAAQS, and required attainment of the standard by 2014. To develop the Plan's required control strategy for meeting state and federal requirements, an iterative process of technology/strategy review and ambient air quality modeling is utilized. The emission inventories for nonattainment areas include base year (2008) and future years' emissions through the attainment year (see Chapter 3 for detail of the inventory) which include emissions reductions achieved by already-adopted measures. The remaining emissions target is initially defined utilizing air quality modeling that will achieve the ambient air quality standards based on reductions from all sources. Control measures based on existing technologies and advancements are then evaluated to determine their effectiveness in meeting this remaining emissions target. Further modeling analyses are conducted using the actual emissions reductions achieved based on the technology forecast. Ultimately an overall emissions target (i.e., carrying capacity) is determined for achieving the ambient air quality standards and for which controls have been proposed.

### Modeling Results

In accordance with U.S. EPA guidelines, the District modeled air quality based on emission reductions achieved due to already-adopted and implemented rules at the federal, state and local levels. This analysis provided the air quality improvements that such programs are projected to offer for the nonattainment area. Future air quality projections for 24-hour PM<sub>2.5</sub> concentrations as shown in Chapter 5 show an air quality improvement over time. There are many factors (e.g., current regulations,

fleet turnover, etc.) contributing to the downward trend of 24-hour PM<sub>2.5</sub> levels, but the reductions from already adopted regulations are not enough to meet the attainment date of 2014 at all monitoring stations. The U.S. EPA does allow an area that cannot meet the standard by the attainment date, based on the severity of its nonattainment problem and feasibility of pollution control measures, to request an extension of the initial attainment date for a period of up to five years. As demonstrated in Chapter 5, the inclusion of the control strategy in combination with already adopted measures will enable the region to achieve attainment by 2014.

### Sensitivity Analysis

There are five major contributors resulting in the formation of PM<sub>2.5</sub> including NO<sub>x</sub>, SO<sub>x</sub>, VOC, directly emitted PM<sub>2.5</sub>, and ammonia. Various combinations of reductions of these pollutants could provide a path to achieve clean air standards. It is useful to weigh the value in tons per day of emissions reductions relative to ambient concentration improvements of PM<sub>2.5</sub>, since different pollutant emissions contribute differently to overall PM<sub>2.5</sub> levels. The Final 2007 AQMP established a set of factors relating regional per ton precursor emissions reductions to microgram per cubic meter improvements of ambient PM<sub>2.5</sub> for the annual average concentration. The current CMAQ model simulations provide a similar set of factors, but this time related to 24-hour average PM<sub>2.5</sub>. For 24-hour average PM<sub>2.5</sub>, the simulations determined that VOC emissions reductions have the lowest benefit in terms of micrograms per cubic meter ambient PM<sub>2.5</sub> reduced per ton of emissions reduction, a third of NO<sub>x</sub>'s effectiveness. The analysis further indicated that SO<sub>x</sub> emissions were about 7.8 times more effective than NO<sub>x</sub>, and that directly emitted PM<sub>2.5</sub> is approximately 14.8 times more effective than NO<sub>x</sub>. It is important to note that the contribution of ammonia emissions is embedded as a component of the SO<sub>x</sub> and NO<sub>x</sub> factors, since ammonium nitrate and ammonium sulfate are the resultant particulate compounds formed in the ambient chemical process.

### Basin-wide and Episodic Short-Term PM<sub>2.5</sub> Measures

The Basin-wide 24-hour PM<sub>2.5</sub> attainment strategy is primarily focused on directly-emitted PM<sub>2.5</sub> and NO<sub>x</sub> reductions which can be feasibly achieved by the attainment date of 2014. Direct PM<sub>2.5</sub> emissions can be substantially reduced by episodically curtailing residential wood burning and open burning from agricultural or prescribed (e.g., brush clearing) sources. NO<sub>x</sub> is a precursor to both PM<sub>2.5</sub> and ozone, and thus NO<sub>x</sub> reductions are preferred since they are also needed for ozone. Thus, further NO<sub>x</sub> reductions from RECLAIM facilities are being proposed as a contingency

measure if attainment of the 24-hour PM<sub>2.5</sub> standard is not achieved by 2014. The Basin-wide control strategy also includes a backstop measure for indirect sources at the ports, initiation of control technology assessments, and a measure focused on education and outreach.

### **8-hour Ozone Strategy**

Although the Basin is projected to meet the 2006 24-hour PM<sub>2.5</sub> standards by the applicable attainment deadlines with the strategy discussed above, significant challenges remain in meeting the federal ozone standards. The next AQMP in 2015 will include a more detailed analysis to demonstrate attainment of the 1997 and 2008 8-hour ozone standards, but it is prudent for both the District and stakeholders to immediately begin development of control strategies for ozone given the looming 2023 deadline. The District will pursue actions that can be implemented over the next two to three years to work towards meeting the 8-hour ozone standards. Ozone reduction strategies and programs need to be continued and accelerated to ensure that the air basin will meet the 8-hour ozone standards by 2024 and 2032. Proposed measures to reduce ozone include emission reductions from coatings, and RECLAIM facilities as well as early transitions to cleaner technologies.

To ultimately achieve the ozone ambient air quality standards, significant additional emissions reductions will be necessary from a variety of sources, including those primarily under the jurisdiction of CARB (e.g., on-road motor vehicles, off-road equipment, and consumer products) and U.S. EPA (e.g., aircraft, ships, trains, and pre-empted off-road equipment). Without an adequate and fair-share level of reductions from all sources, the emission reduction burden would unfairly be shifted to sources that have already been doing their part for clean air. Moreover, the District will continue to use its available regulatory authority to further control mobile source emissions where federal or State actions do not meet regional needs.

Overall, the Final 2012 AQMP includes 21 stationary and 17 mobile source measures. The following seven sections discuss the control measures, SIP commitments, overall emission reductions and implementation as outlined below:

- Proposed Short-term PM<sub>2.5</sub> Control Measures (see Appendix IV-A for detailed descriptions of the District's stationary source control measures)
- Proposed PM<sub>2.5</sub> Contingency Measures (see Chapter 6 for a detailed discussion of the contingency requirements)

- SCAG's Regional Transportation Strategy and Transportation Control Measures (see Appendix IV-C for detailed descriptions of the regional transportation strategy and control measures)
- Proposed 8-hour Ozone Measures (see Appendix IV-A for detailed descriptions of the District's stationary source control measures and Appendix IV-B for detailed descriptions of the District's mobile source measures)
- District's SIP Emission Reduction Commitment
- Overall Emission Reductions
- Implementation

## **PROPOSED PM<sub>2.5</sub> SHORT-TERM CONTROL MEASURES**

The proposed short-term PM<sub>2.5</sub> control measures include stationary source control measures, episodic controls, technology assessments, an indirect source measure and one education measure. As noted earlier in this chapter, a public process to solicit input assisted District staff in developing and proposing feasible control measures and strategies that could be adopted and implemented in the short-term. The assessment considered whether adoption and implementation of control measures could reasonably take place prior to 2014 resulting in attainment of the 2006 24-hour PM<sub>2.5</sub> standard of 35 µg/m<sup>3</sup> by the 2014 attainment year. Each short-term PM<sub>2.5</sub> control measure was evaluated to determine the potential emission reductions that could be achieved. In some cases, only a range of possible emissions reductions could be determined, and for some others, the magnitude of potential reductions cannot be determined at this time.

Table 4-2 provides a list of the District's short-term PM<sub>2.5</sub> measures along with the anticipated adoption date, implementation date and emissions reduction. 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).

**TABLE 4-2**

List of District's Adoption/Implementation Dates and Estimated Emission Reductions from Short-Term PM<sub>2.5</sub> Control Measures

NUMBER	TITLE	ADOPTION	IMPLEMENTATION PERIOD	REDUCTION (TPD)
CMB-01	Further NO <sub>x</sub> Reductions from RECLAIM [NO <sub>x</sub> ] –Phase I (Contingency)	2013	2014	2-3 <sup>a</sup>
BCM-01	Further Reductions from Residential Wood Burning Devices [PM <sub>2.5</sub> ]	2013	2013-2014	7.1 <sup>b</sup>
BCM-02	Further Reductions from Open Burning [PM <sub>2.5</sub> ]	2013	2013-2014	4.6 <sup>c</sup>
BCM-03 (formerly BCM-05)	Emission Reductions from Under-Fired Charbroilers [PM <sub>2.5</sub> ]	Phase I – 2013 (Tech Assessment) Phase II - TBD	TBD	1 <sup>d</sup>
BCM-04	Further Ammonia Reductions from Livestock Waste [NH <sub>3</sub> ]	Phase I – 2013-2014 (Tech Assessment) Phase II - TBD	TBD	TBD <sup>e</sup>
IND -01 (formerly MOB-03)	Backstop Measures for Indirect Sources of Emissions from Ports and Port-Related Facilities [NO <sub>x</sub> , SO <sub>x</sub> , PM <sub>2.5</sub> ]	2013	12 months after trigger	N/A <sup>f</sup>
EDU-01 (formerly MCS-02, MCS-03)	Further Criteria Pollutant Reductions from Education, Outreach and Incentives [All Pollutants]	Ongoing	Ongoing	N/A <sup>f</sup>
MCS-01 (formerly MCS-07)	Application of All Feasible Measures Assessment [All Pollutants]	Ongoing	Ongoing	TBD <sup>e</sup>

- a. Emission reductions are included in the SIP as a contingency measure.
- b. Winter average day reductions based on episodic conditions and 75 percent compliance rate.
- c. Reductions based on episodic day conditions.
- d. Will submit into SIP once technically feasible and cost effective options are confirmed.
- e. TBD are reductions to be determined once the technical assessment is complete, and inventory and control approach are identified.
- f. N/A are reductions that cannot be quantified due to the nature of the measure (e.g., outreach, incentive programs) or if the measure is designed to ensure reductions that have been assumed to occur will in fact occur.

Each control measure type relies on a number of control methods. Table 4-3 provides the types of proposed short-term measures and their typical corresponding control methods.

**TABLE 4-3**  
Proposed Short-Term Measure Control Methods

SOURCE CATEGORY	CONTROL METHOD
Combustion Sources	<ul style="list-style-type: none"> <li>• Add-On Controls</li> <li>• Market Incentives</li> <li>• Process Improvement</li> <li>• Improved Energy Efficiency</li> </ul>
Best Available Control Measures for Fugitive Ammonia Sources	<ul style="list-style-type: none"> <li>• Best Management Practices</li> <li>• Best Available Control Technology</li> <li>• Process Improvement</li> </ul>
Multiple Component Sources	<ul style="list-style-type: none"> <li>• Geographic Controls</li> <li>• Process Modifications and Improvements</li> <li>• Add-On Controls</li> <li>• Best Management Practices</li> <li>• Best Available Control Technology</li> <li>• Market Incentives</li> <li>• Energy Efficiency and Conservation</li> </ul>
Indirect Source	<ul style="list-style-type: none"> <li>• Emission Control Plans</li> <li>• Contractual Requirements</li> <li>• Tariffs, Incentives/Disincentives</li> </ul>
Educational Programs	<ul style="list-style-type: none"> <li>• Increased Awareness</li> <li>• Technical Assistance</li> </ul>

The following text provides a brief description of the District's short-term measures.

Combustion Sources

This category includes a control measure that further reduces NOx emissions from RECLAIM facilities.

**CMB-01 – FURTHER NOX REDUCTIONS FROM RECLAIM (PHASE I):**

This proposed control measure is a contingency measure to be automatically triggered if the 24-hour PM2.5 standard is not met by the 2014 attainment date. The control measure will seek further reductions of 2 tpd of NOx allocations if triggered. In addition, staff would seek to identify appropriate approaches during rulemaking to

implement the allocation shaving methodology. The control measure has the ability to produce co-benefits in the reduction of PM<sub>2.5</sub> and ozone.

### PM Sources

This category includes four control measures, including episodic curtailment of residential wood burning and opening burning, PM<sub>2.5</sub> emission reductions from under-fired charbroilers and ammonia emission reductions from livestock waste. The under-fired charbroiler measure has been carried over from the 2007 AQMP.

**BCM-01 - FURTHER REDUCTIONS FROM RESIDENTIAL WOOD BURNING DEVICES:** The purpose of this measure would be to seek further PM<sub>2.5</sub> emissions reductions from residential wood burning fireplaces and wood stoves whenever key areas in the South Coast Air Basin are forecast to approach the federal 24-hour PM<sub>2.5</sub> standard. A review of other California air district regulations has indicated that the most appropriate amendment to the existing AQMD wood smoke control program would be to decrease the mandatory wood burning curtailment forecast threshold from 35 µg/m<sup>3</sup> to a more conservative 30 µg/m<sup>3</sup>. In addition to the existing sub-regional curtailment program of Rule 445 (based on areas forecast to exceed the existing PM<sub>2.5</sub> standard), this measure would implement a curtailment that would apply Basin-wide whenever a PM<sub>2.5</sub> level of greater than 30 µg/m<sup>3</sup> is forecast at any monitoring station, which has recorded violations of the design value for the current PM<sub>2.5</sub> 24-hour standard of 35 µg/m<sup>3</sup> for either of the two previous three-year design value periods. Lowering the wood burning curtailment forecast threshold and applying the curtailment to the entire Basin when triggered could potentially reduce Basin-wide ambient PM<sub>2.5</sub> concentrations on these episodic no-burn days by about 7.1 tons per winter day (assuming 75% rule effectiveness).

**BCM-02 - FURTHER REDUCTIONS FROM OPEN BURNING:** Rule 444 outlines the criteria and guidelines for agricultural and prescribed burning, as well as training burns, to minimize PM emissions and smoke in a manner that is consistent with state and federal laws. Agricultural burning is open burning of vegetative materials produced from the growing and harvesting of crops. Prescribed burning is a planned open burning of vegetative materials, usually conducted by a fire protection agency and/or department of forestry, to promote a healthier habitat for plants and animals, to prevent plant disease and pests, and to reduce the risk of wild fires. Training burns are hands-on instructional events conducted by fire protection agencies on methods of preventing and/or suppressing fire. Rule 444 currently contains requirements that a no-burn day may be called under a combination of

geographical, meteorological, and air quality conditions. This control measure would potentially increase the number of no-burn days by establishing an additional criteria for no-burn during episodic days as described in control measure BCM-01 by implementing a curtailment that would apply Basin-wide whenever a PM<sub>2.5</sub> level of greater than 30 µg/m<sup>3</sup> is forecast at any monitoring station which has recorded violations of the design value for the current PM<sub>2.5</sub> 24-hour standard of 35 µg/m<sup>3</sup> for either of the two previous three-year design value periods. Enhancing the open burning restrictions with this new threshold criteria and applying a curtailment to the entire Basin could potentially reduce Basin-wide ambient PM<sub>2.5</sub> concentrations on these episodic no-burn days by about 4.6 tons per winter day. Since the burning would likely be shifted to other days, the total annual emissions would remain the same, but would not occur on days where high PM<sub>2.5</sub> levels are forecast.

**BCM-03 - EMISSION REDUCTIONS FROM UNDER-FIRED CHARBROILERS:** This proposed measure seeks emission reductions by potentially requiring new and/or existing medium to large volume restaurants with under-fired charbroilers to install control devices meeting a minimum efficiency requirement. Under-fired charbroilers are responsible for the majority of emissions from restaurant operations – 84 percent of PM and 71 percent of VOC emissions. Several control options are currently being evaluated and tested including electrostatic precipitators (ESP), high efficiency particulate arresting (HEPA) filters, wet scrubbers, and thermal oxidizers. Under-fired charbroilers are one of the largest unregulated sources of directly emitted PM. A technical assessment of potential control technologies is currently ongoing at University of California, Riverside (CE-CERT), to evaluate the efficiency and the cost-effectiveness of various control devices for the capture and control of filterable and/or condensable forms of PM from under-fired charbroilers. The Bay Area AQMD adopted a rule for commercial cooking equipment that controls both chain-driven and under-fired charbroilers. The Bay Area measure will be evaluated to meet the all feasible measures requirement. Technical and economic feasibility, as well as affordability of controls, particularly for existing restaurants relative to retrofit installation and operation/maintenance, will be considered in conjunction with any future rule development to establish requirements for under-fired charbroilers.

**BCM-04 – FURTHER AMMONIA REDUCTIONS FROM LIVESTOCK WASTE:** This measure seeks to reduce ammonia emissions from livestock operations with emphasis on dairies. Existing Rule 1127 – Emission Reductions from Livestock Waste requires best management practices for dairies and specific

requirements regarding manure removal, handling, and composting; however, the rule does not focus on fresh manure, which is one of the largest dairy sources of ammonia emissions. An assessment will be conducted to evaluate the use of sodium bisulfate (SBS) at local dairies to evaluate the technical and economic feasibility of its application, as well as potential impacts to ground water, and the health and safety of both workers and dairy stock. Reducing pH level in manure through the application of acidulant additives (acidifier), such as SBS, is one of the potential mitigations for ammonia. SBS is currently being considered for use in animal housing areas where high concentrations of fresh manure are located. Research indicates that best results occur when SBS is used on “hot spots”. SBS can also be applied to manure stock piles and at fencelines, and upon scraping manure to reduce ammonia spiking from the leftover remnants of manure and urine. SBS application may be required seasonally or episodically during times when high ambient PM<sub>2.5</sub> levels are forecast.

#### Multiple Component Sources

There is one short-term control measure for all feasible measures.

#### **MCS-01: APPLICATION OF ALL FEASIBLE MEASURES ASSESSMENT:**

This control measure is to address the state law requirement for all feasible measures for ozone. Existing rules and regulations for pollutants such as VOC, NO<sub>x</sub>, SO<sub>x</sub> and PM reflect current best available retrofit control technology (BARCT). However, BARCT continually evolves as new technology becomes available that is feasible and cost-effective. Through this proposed control measure, the District would commit to the adoption and implementation of the new retrofit control technology standards. Finally, staff will review actions taken by other air districts for applicability in our region.

#### Indirect Sources

This category includes a proposed control measure carried over from the 2007 AQMP (formerly MOB-03) that establishes a backstop measure for indirect sources of emissions at ports.

**IND-01- BACKSTOP MEASURE FOR INDIRECT SOURCES OF EMISSIONS FROM PORTS AND PORT-RELATED FACILITIES:** The goal of this measure is to ensure that NO<sub>x</sub>, SO<sub>x</sub> and PM<sub>2.5</sub> emissions reductions from port-related sources are sufficient to attain the 24-hr federal PM<sub>2.5</sub> ambient air quality

standard. If emission levels projected to result from the current regulatory requirements and voluntary reduction strategies specified by the Ports are not realized, the 24-hr federal PM<sub>2.5</sub> ambient air quality standard may not be achieved. This control measure is designed to ensure that the necessary emission reductions from port-related sources projected in the 2012 AQMP milestone years are achieved or if it is later determined through a SIP amendment that additional region-wide reductions are needed due to the change in Basin-wide carrying capacity for PM<sub>2.5</sub> attainment. In this case, the ports will be required to further reduce their emissions on a “fair-share” basis.

#### Educational Programs

There is one proposed educational program within this category.

**EDU-01: FURTHER CRITERIA POLLUTANT REDUCTIONS FROM EDUCATION, OUTREACH AND INCENTIVES:** This proposed control measure seeks to provide educational outreach and incentives for consumers to contribute to clean air efforts. Examples include the usage of energy efficient products, new lighting technology, “super compliant” coatings, tree planting, and the use of lighter colored roofing and paving materials which reduce energy usage by lowering the ambient temperature. In addition, this proposed measure intends to increase the effectiveness of energy conservation programs through public education and awareness as to the environmental and economic benefits of conservation. Educational and incentive tools to be used include social comparison applications (comparing your personal environmental impacts with other individuals), social media, and public/private partnerships.

### **PROPOSED PM<sub>2.5</sub> CONTINGENCY MEASURES**

Pursuant to CAA section 172(c)(9), contingency measures are emission reduction measures that are to be automatically triggered and implemented if an area fails to attain the national ambient air quality standard by the applicable attainment date, or fails to make reasonable further progress (RFP) toward attainment. Further detailed descriptions of contingency requirements can be found in Chapter 6 – Clean Air Act Requirements. As discussed in Chapter 6 and consistent with U.S. EPA guidance, the District is proposing to use excess air quality improvement from the proposed control strategy, as well as potential NO<sub>x</sub> reductions from CMB-01 listed above, to demonstrate compliance with this federal requirement.

## **SCAG's REGIONAL TRANSPORTATION STRATEGY AND TRANSPORTATION CONTROL MEASURES**

The Southern California Association of Governments (SCAG), the Metropolitan Planning Organization (MPO) for Southern California, is mandated to comply with federal and state transportation and air quality regulations. Federal transportation law authorizes federal funding for highway, highway safety, transit, and other surface transportation programs. The federal CAA establishes air quality standards and planning requirements for various criteria air pollutants.

Transportation conformity is required under CAA Section 176(c) to ensure that federally supported highway and transit project activities “conform to” the purpose of the SIP. Conformity currently applies to areas that are designated non-attainment, and those re-designated to attainment after 1990 (“maintenance areas” with plans developed under CAA Section 175[A]) for the specific transportation-related criteria pollutants. Conformity to the purpose of the SIP means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS. The transportation conformity regulation is found in 40 CFR Part 93.

Pursuant to California Health and Safety Code section 40460, SCAG has the responsibility of preparing and approving the portions of the AQMP relating to regional demographic projections and integrated regional land use, housing, employment, and transportation programs, measures, and strategies. The District combines its portion of the Plan with those prepared by SCAG.

The transportation strategy and transportation control measures (TCMs), included as part of the 2012 PM<sub>2.5</sub> AQMP and SIP for the South Coast Air Basin, are based on SCAG's adopted 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) and 2011 Federal Transportation Improvement Program (FTIP). This was developed in consultation with federal, state and local transportation and air quality planning agencies and other stakeholders.

The Regional Transportation Strategy and Transportation Control Measures portion of the 2012 AQMP/SIP consists of the following three related sections.

## **Section I. Linking Regional Transportation Planning to Air Quality Planning**

As required by federal and state laws, SCAG is responsible for ensuring that the regional transportation plan, program, and projects are supportive of the goals and objectives of AQMPs/SIPs. SCAG is also required to develop demographic projections and a regional transportation strategy and control measures for the AQMPs/SIPs.

The RTP/SCS, updated every four years, is a long-range regional transportation plan that provides a vision for transportation investments throughout the SCAG Region. The 2012-2035 RTP/SCS also integrates land use and transportation planning to achieve regional greenhouse gas (GHG) reduction targets set by ARB pursuant to SB375.

SCAG also develops the biennial FTIP. The FTIP is a multimodal program of capital improvement projects to be implemented over a six year period. The FTIP implements the programs and projects in the RTP/SCS.

## **Section II. Regional Transportation Strategy and Transportation Control Measures**

The SCAG Region faces daunting mobility, air quality, and transportation funding challenges. Under the guidance of the goals and objectives adopted by SCAG's Regional Council, the 2012-2035 RTP/SCS was developed to provide a blueprint to integrate land use and transportation strategies to help achieve a coordinated and balanced regional transportation system. The 2012-2035 RTP/SCS represents the culmination of more than two years of work involving dozens of public agencies, 191 cities, hundreds of local, county, regional and state officials, the business community, environmental groups, as well as various nonprofit organizations. The 2012-2035 RTP/SCS was formally adopted by the SCAG Regional Council on April 4, 2012.

The 2012-2035 RTP/SCS contains a host of improvements to every component of the regional multimodal transportation system including:

- Active transportation (non-motorized transportation, such as biking and walking)
- Transportation demand management (TDM)
- Transportation system management (TSM)
- Transit

- Passenger and high-speed rail
- Goods movement
- Aviation and airport ground access
- Highways
- Arterials
- Operations and maintenance

Included within these transportation system improvements are TCM projects that reduce vehicle use or change traffic flow or congestion conditions. TCMs include the following three main categories of transportation improvement projects and programs:

- High occupancy vehicle (HOV) measures,
- Transit and systems management measures, and
- Information-based transportation strategies.

New to this cycle of the RTP is the inclusion of the SCS as required by SB 375. The primary goal of the SCS is to provide a vision for future growth in Southern California that will decrease per capita GHG emissions from passenger vehicles. However, the strategies contained in the 2012-2035 RTP/SCS will produce benefits for the region far beyond simply reducing GHG emissions. The SCS integrates the transportation network and related strategies with an overall land use pattern that responds to projected growth, housing needs, changing demographics, and transportation demands. The regional vision of the SCS maximizes current voluntary local efforts that support the goals of SB 375. The SCS focuses the majority of new housing and job growth in high-quality transit areas and other opportunity areas on existing main streets, in downtowns, and commercial corridors, resulting in an improved jobs-housing balance and more opportunity for transit-oriented development. In addition, SCAG is a strategic partner in a regional effort to accelerate fleet conversion to near-zero and zero-emission transportation technologies, including planning for the expansion of alternative-fuel infrastructure to accommodate the anticipated increase in alternative fueled vehicles.

### **Section III. Reasonably Available Control Measure (RACM) Analysis for Transportation Control Measures**

As required by the CAA, a RACM analysis must be included as part of the overall control strategy in the AQMP/SIP to ensure that all potential control measures are evaluated for implementation and that justification is provided for those measures

that are not implemented. Appendix IV-C contains the RACM TCM component for the Basin's 24-hour PM<sub>2.5</sub> control strategy. In accordance with U.S. EPA procedures, this analysis considers TCMs in the 2012-2035 RTP/SCS, measures identified by the CAA, and relevant measures adopted in other non-attainment areas of the country. Based on this comprehensive review, it is determined that the TCMs being implemented in the Basin are inclusive of all TCM RACM. None of the candidate measures reviewed and determined to be infeasible meets the criteria for RACM implementation.

The emission benefits associated with the RTP/SCS are reflected in the 2012 AQMP projected emissions. The transportation strategy is estimated to reduce 0.4 ton per day of NO<sub>x</sub> and 0.1 ton per day VOC in 2014. The estimated emissions benefits of future TCM projects in 2014 are reductions of 0.7 ton per day of NO<sub>x</sub>, 0.3 ton per day of VOC, and 0.1 ton per day of PM<sub>2.5</sub>.

For a detailed discussion of the regional transportation strategy, refer to Appendix IV-C: Regional Transportation Strategy and Control Measures.

## **PROPOSED 8-HOUR OZONE MEASURES (TO REDUCE EMISSIONS ASSOCIATED WITH CAA SECTION 182(e)(5) MEASURES)**

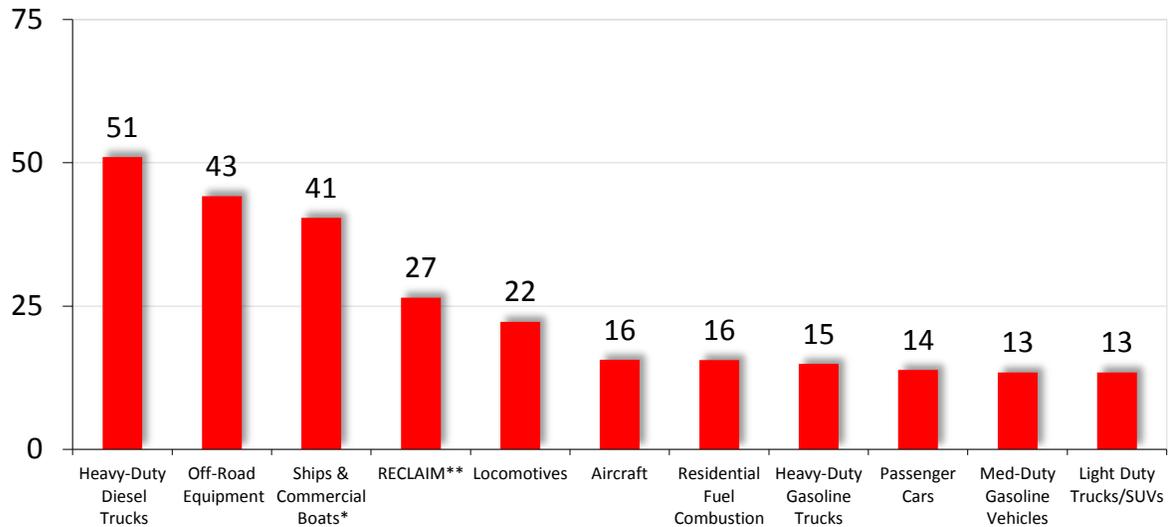
The 2007 State Implementation Plan (SIP) for the 8-hour ozone NAAQS contains commitments for emission reductions that rely on advancement of technologies, as authorized under Section 182(e)(5) of the federal Clean Air Act. These measures, which have come to be known as the “black box,” account for a substantial portion of the NO<sub>x</sub> emission reductions needed to attain the federal ozone standards – over 200 tons/day. The deadlines to reduce ozone concentrations in the region are 2023 (to attain the 80 ppb NAAQS), and 2032 (to attain 75 ppb NAAQS)<sup>1</sup>. Attaining these standards will require substantial reductions in emissions of NO<sub>x</sub> well beyond reductions resulting from current rules, programs, and commercially available technologies. Given the relatively large size of the “black box” measures, it is important to continue to reduce the reliance on Section 182(e)(5) long-term emissions reductions as ozone attainment dates approach. To this end, all feasible

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<sup>1</sup> The attainment deadline for the 75 ppb standard (adopted in 2008) for an extreme non-attainment area is December 31, 2032.

ozone control measures are included in this Final 2012 AQMP as an update to the previously approved 2007 8-hour ozone SIP.

Mobile sources emit over 80 percent of regional NOx and therefore must be the largest part of the solution. As provided in Figure 4-1, on-road truck categories are projected to comprise the single largest contributor to regional NOx in 2023. Other equipment involved in goods movement, such as marine vessels, locomotives and aircraft, are also substantial NOx sources.



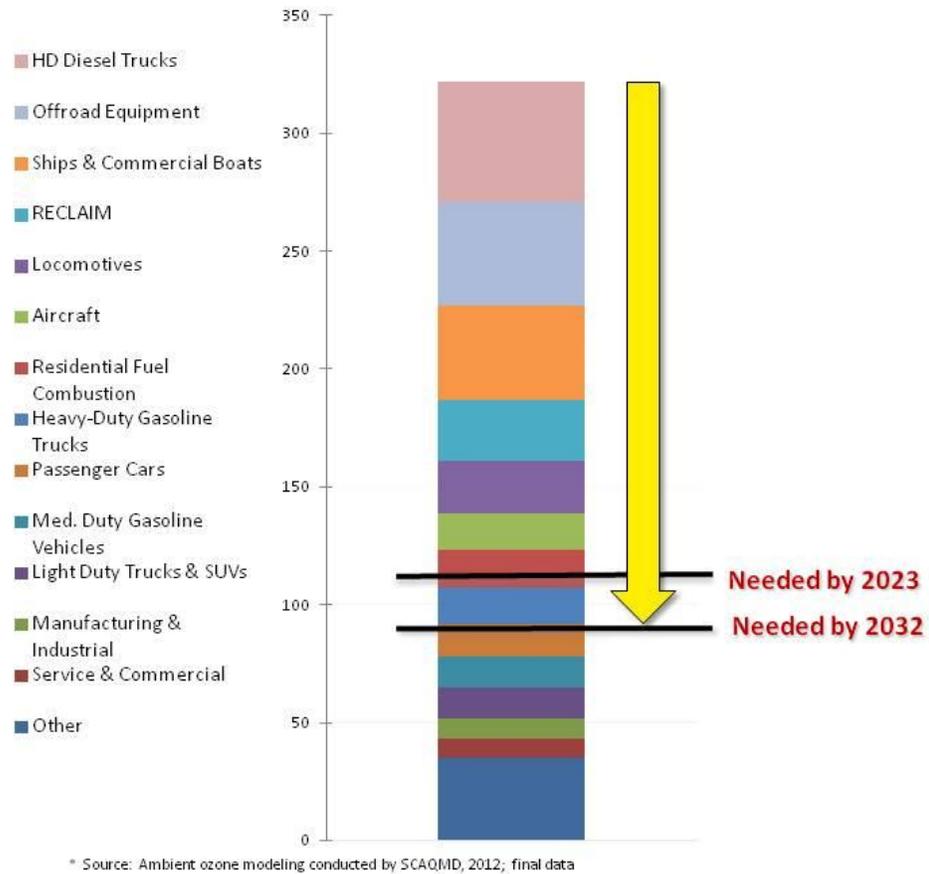
\*Oceangoing vessels = 32 tons/day

\*\*RECLAIM: 320 largest stationary sources, including all refineries and power plants

**FIGURE 4-1**

Top NOx Emissions Categories and Corresponding NOx Emissions (tons per day) in 2023 in the South Coast Air Basin, Annual Average Day

Figure 4-2 shows projections indicating that the region must reduce regional NOx emissions by about 65% by 2023, and 75% by 2032, to attain the 8-hour ozone NAAQS as required by federal law.



**FIGURE 4-2**  
 Needed NOx Emission Reductions to Achieve  
 Federal 8-Hour Ozone Ambient Air Quality Standards

Since most significant emission sources are already controlled by over 90%, attainment of the ozone standards will require broad deployment of zero- and near-zero<sup>2</sup> emission technologies in the 2023 to 2032 timeframe. On-land transportation sources such as trucks, locomotives, and cargo handling equipment have technological potential to achieve zero- and near-zero emission levels. Current and potential technologies include hybrid-electric, battery-electric, and hydrogen fuel cell

<sup>2</sup> The term “near-zero emissions” refers to emissions approaching zero and will be delineated for individual source categories through the process of developing the Air Quality Management Plan/State Implementation Plan and subsequent control measures. Based on current analyses, on-land transportation sources will need to achieve zero emissions where possible, and otherwise will need to be substantially below adopted emission standards — including standards with future effective dates. Near-zero emissions technologies can help meet this need, particularly if they support a path toward zero emissions (e.g. electric/fossil fuel hybrids with all-electric range).

on-road vehicle technologies. New types of hybrids could also serve long-term needs while providing additional fuel diversity. These could include, for example, natural gas-electric hybrid technologies for on-road and other applications, particularly if coupled with improved after-treatment technologies. Equipment powered solely by alternative fuels such as natural gas may also play a long-term role in some applications, if those applications are found to pose technological barriers to achieving zero or near-zero emissions. Even in such applications, however, substantial additional emission reductions will be needed through development of new, advanced after-treatment technologies. In addition, alternative fuels will likely play a transitional near-term role. Alternative fuels such as natural gas have historically helped the region make progress toward attaining air quality standards, and -- while not achieving zero or near-zero NO<sub>x</sub> emission levels -- they are generally cleaner than conventional fuels. Given the region's need to attain air quality standards in a few short years, alternative fueled engines will continue to play a role. Finally, we emphasize that air quality regulatory agencies have traditionally set policies and requirements that are performance based and technology and fuel neutral -- a policy that the District intends to continue. In short, all technologies and fuels should be able to compete on equal footing to meet environmental needs.

While there has been much progress in developing and deploying transportation technologies with zero- and near-zero emissions (particularly for light-duty vehicles and passenger transit), additional technology development, demonstration and commercialization will be required prior to broad deployment in freight and other applications. This section describes a path to evaluate, develop, demonstrate, fund and deploy such technologies for land-based transportation sources. It also proposes near-term measures to accelerate fleet turnover to the lowest emission units, and require deployment of zero-emission technologies where most feasible.

The District staff believes that a combination of regulatory actions and public funding is the most effective means of achieving these emission reductions. Voluntary incentive programs such as the Carl Moyer Program can help to accelerate turnover to the cleanest commercially available equipment. A majority of the on-road and off-road measures proposed are based on existing funding programs implemented by the District or the California Air Resources Board. However, several of the existing funding programs will sunset in the 2014 – 2015 timeframe. Continued funding beyond 2015 will be needed to reduce the emissions associated with the black box. Developing, demonstrating and deploying new technologies will require public/private partnerships and, in some cases, regulatory actions.

The measures described in this section are a relatively small down payment on the total emission reductions needed to attain the current NAAQS for ozone. The measures proposed in this section and further discussed in Appendix IV-A and IV-B are feasible steps that must commence in the near-term to establish a path toward a broader transition to the technologies that will be needed to attain federal air quality standards. Between now and 2015, the additional measures needed to attain both the 75 and 80 ppb ozone NAAQS will be fleshed out in greater detail as required under the federal Clean Air Act as part of the next AQMP revision (see Chapters 5 and 6 for further discussions). Given the magnitude of needed emission reductions, and the time remaining until attainment deadlines, it is important that progress and momentum to identify, develop, and deploy needed technologies be sustained and accelerated.

The District staff recognizes these are very difficult policy choices the Basin is facing. Transitioning over the next 10 to 20 years to cleaner transportation technologies will involve major costs and effects on the economy. However, adopting sufficient plan measures to attain the ozone air quality standard by 2024 is required by federal law and therefore, failing to do so is not an acceptable public policy. Such failure would also risk adverse health consequences highlighted in recent health studies, not to mention the potential adverse economic impacts on the region due to potential federal sanctions. The following sections summarize the measures to help reduce the emissions associated with the “black box” (Section 182(e)(5)) measures. More detailed discussions are provided in Appendix IV-A and IV-B.

### **Proposed Stationary Source 8-hour Ozone Measures**

The proposed stationary source ozone measures are designed to assist in the attainment of the 8-hour ozone standard. The measures target a number of source categories including Coatings and Solvents (CTS), Combustion Sources (CMB), Petroleum Operations and Fugitive VOC Emissions (FUG), Multiple Component Sources (MCS), Incentive Programs (INC) and Educational Programs (EDU). There are 15 stationary source measures with the majority anticipated to be adopted in the next 2-3 years and implemented after 2015. Table 4-4 provides a list of the District’s 8-hour ozone measures for stationary sources along with the anticipated adoption date, implementation date and emission reduction.

**TABLE 4-4**

List of the District's Adoption/Implementation Dates and Estimated Emission Reductions from Stationary Source 8-hour Ozone Measures

NUMBER	TITLE	ADOPTION	IMPLEMENTATION PERIOD	REDUCTION (TPD)
CTS-01	Further VOC Reductions from Architectural Coatings (R1113) [VOC]	2015 - 2016	2018 – 2020	2-4
CTS-02	Further Emission Reduction from Miscellaneous Coatings, Adhesives, Solvents and Lubricants [VOC]	2013 - 2016	2015 – 2018	1-2
CTS-03	Further VOC Reductions from Mold Release Products [VOC]	2014	2016	0.8 – 2
CMB-01	Further NO <sub>x</sub> Reductions from RECLAIM [NO <sub>x</sub> ] – Phase II	2015	2020	1-2 <sup>a</sup>
CMB-02	NO <sub>x</sub> Reductions from Biogas Flares [NO <sub>x</sub> ]	2015	Beginning 2017	TBD <sup>b</sup>
CMB-03	Reductions from Commercial Space Heating [NO <sub>x</sub> ]	Phase I – 2014 (Tech Assessment) Phase II - 2016	Beginning 2018	0.18 by 2023 0.6 (total)
FUG-01	VOC Reductions from Vacuum Trucks [VOC]	2014	2016	1 <sup>c</sup>
FUG-02	Emission Reduction from LPG Transfer and Dispensing [VOC] – Phase II	2015	2017	1-2
FUG-03	Further Reductions from Fugitive VOC Emissions [VOC]	2015 -2016	2017-2018	1-2
MCS-01	Application of All Feasible Measures Assessment [All Pollutants]	Ongoing	Ongoing	TBD <sup>b</sup>
MCS-02	Further Emission Reductions from Greenwaste Processing (Chipping and Grinding Operations not associated with composting) [VOC]	2015	2016	1 <sup>c</sup>
MCS-03 (formerly MCS-06)	Improved Start-up, Shutdown and Turnaround Procedures [All Pollutants]	Phase I – 2012 (Tech Assessment) Phase II - TBD	Phase I – 2013 (Tech Assessment) Phase II – TBD	TBD <sup>b</sup>

**TABLE 4-4 (concluded)**

List of the District’s Adoption/Implementation Dates and Estimated Emission Reductions from Stationary Source 8-hour Ozone Measures

NUMBER	TITLE	ADOPTION	IMPLEMENTATION PERIOD	REDUCTION (TPD)
INC-01	Economic Incentive Programs to Adopt Zero and Near-Zero Technologies [NOx]	2014	Within 12 months after funding availability	TBD <sup>b</sup>
INC-02	Expedited Permitting and CEQA Preparation Facilitating the Manufacturing of Zero and Near-Zero Technologies [All Pollutants]	2014-2015	Beginning 2015	N/A <sup>d</sup>
EDU-01 <i>(formerly MCS-02, MCS-03)</i>	Further Criteria Pollutant Reductions from Education, Outreach and Incentives [All Pollutants]	Ongoing	Ongoing	N/A <sup>d</sup>

- a. If Control Measure CMB-01, RECLAIM Phase I, contingency measure emission reductions are not triggered and implemented, Phase II will target a cumulative 3-5 TPD of NOx emission reductions.
- b. TBD are reductions to be determined once the inventory and control approach are identified.
- c. Reductions submitted in SIP once emission inventories are included in the SIP.
- d. N/A are reductions that cannot be quantified due to the nature of the measure (e.g., outreach, incentive programs) or if the measure is designed to ensure reductions that have been assumed to occur will in fact occur.

Each control measure type typically relies on a number of control methods. Table 4-5 provides the types of proposed short-term measures and their typical corresponding control methods.

**TABLE 4-5**

Proposed Short-Term Measure Control Methods

SOURCE CATEGORY	CONTROL METHOD
Coatings and Solvents	<ul style="list-style-type: none"> <li>• Reformulation</li> <li>• Higher Transfer Efficiency</li> <li>• Process Improvements</li> <li>• Add-On Controls</li> <li>• Alternative Coating and Solvent Application Methods</li> <li>• Market Incentives</li> <li>• Improved Housekeeping Practices</li> </ul>
Combustion Sources	<ul style="list-style-type: none"> <li>• Add-On Controls</li> <li>• Market Incentives</li> <li>• Process Improvement</li> <li>• Improved Energy Efficiency</li> </ul>
Petroleum Operations and Fugitive VOC Emissions	<ul style="list-style-type: none"> <li>• Process Modifications</li> <li>• Add-On Controls Systems</li> <li>• Market Incentives</li> <li>• Enhanced Inspection and Maintenance</li> <li>• Improved Vapor Recovery Systems</li> <li>• Good Management Practices</li> </ul>
Multiple Component Sources	<ul style="list-style-type: none"> <li>• Process Modifications and Improvements</li> <li>• Add-On Controls</li> <li>• Best Management Practices</li> <li>• Best Available Control Technology</li> <li>• Market Incentives</li> <li>• Energy Efficiency and Conservation</li> </ul>
Incentive Programs	<ul style="list-style-type: none"> <li>• Funding</li> <li>• Investment in Clean Technologies</li> <li>• Private/Public Partnerships</li> </ul>
Educational Programs	<ul style="list-style-type: none"> <li>• Increased Awareness</li> <li>• Technical Assistance</li> </ul>

The following text provides a brief description of the proposed stationary source 8-hour ozone measures.

### Coatings and Solvents

The category of coatings and solvents is primarily targeted at reducing VOC emissions from these VOC-containing products. This category includes three proposed control measures that are based on additional emission reductions from architectural coatings; miscellaneous coatings, solvents, adhesives and lubricants; and mold release products.

**CTS-01 – FURTHER VOC REDUCTIONS FROM ARCHITECTURAL COATINGS:** The District adopted Rule 1113 – Architectural Coatings, in 1977 and it has since undergone numerous amendments. This proposed control measure seeks to reduce the VOC emissions from large volume coating categories such as flat, non-flat and primer, sealer, undercoaters (PSU) and from phasing out the currently exempt use of high-VOC architectural coatings sold in one liter containers or smaller. Additional emission reductions could be achieved from the application of architectural coatings by use of application techniques with greater transfer efficiency. Such transfer efficiency improvements could be achieved through the use of a laser paint targeting system, which has been shown to improve transfer efficiency on average by 30% over equipment not using a targeting system, depending on the size, shape and configuration of the substrate. The proposal is anticipated to be accomplished with a multi-phase adoption and implementation schedule.

**CTS-02 – FURTHER VOC REDUCTIONS FROM MISCELLANEOUS COATINGS, ADHESIVES, SOLVENTS, AND LUBRICANTS:** This control measure seeks VOC emission reductions by focusing on select coating, adhesive, solvent and lubricant categories by further limiting the allowable VOC content in formulations. Examples of the categories to be considered include but are not limited to, coatings used in aerospace applications; adhesives used in a variety of sealing applications; solvents for graffiti abatement activities; and lubricants used as metalworking fluids to reduce heat and friction to prolong life of the tool, improve product quality and carry away debris. Reductions would be achieved by lowering the VOC content of the coatings, adhesives and lubricants. For solvents, reductions could be achieved with the use of alternative low-VOC products or non-VOC product/equipment at industrial facilities. The proposal is anticipated to be accomplished with a multi-phase adoption and implementation schedule.

**CTS-03 – FURTHER VOC REDUCTION FROM MOLD RELEASE PRODUCTS:** Metal, fiberglass, composite and plastic products are often manufactured using molds which form the product into a particular configuration. Mold release agents are used to ensure that the parts, as they are made, can be released easily and quickly from the molds. These agents often contain VOC solvent carriers and may also contain toxic components like toluene and xylene. Mold release products are also used for concrete stamping operations to keep the mold from adhering to the fresh concrete. Residential and commercial concrete stamping is a rapidly growing industry, and overall VOC emissions are estimated to be significant. This control measure seeks to reduce emissions from mold release products on metal, fiberglass, composite and plastic products, as well as concrete stamping operations, by requiring the use of low-VOC mold release products.

#### Combustion Sources

This category includes three proposed measures for stationary combustion equipment. There is one control measure that further reduces NO<sub>x</sub> emissions from RECLAIM facilities. A second proposed measure seeks a reduction from biogas flares, and a third proposed control measure seeks to reduce NO<sub>x</sub> emissions from commercial space heaters.

**CMB-01 – FURTHER NO<sub>x</sub> REDUCTIONS FROM RECLAIM (PHASE II):** This proposed control measure will seek further reductions of 1-2 tpd in NO<sub>x</sub> allocations by the year 2020. This phase of control is to implement periodic BARCT evaluation as required under the state law. If Control Measure CMB-01, RECLAIM Phase I, contingency measure emission reductions are not triggered and implemented, Phase II will target a cumulative 3-5 TPD of NO<sub>x</sub> emission reductions, which will be incorporated into the 2015 AQMP. The control measure has the ability to produce co-benefits in the reduction of PM<sub>2.5</sub> and ozone.

**CMB-02 – NO<sub>x</sub> REDUCTIONS FROM BIOGAS FLARES:** There are no source-specific rules regulating NO<sub>x</sub> emissions from biogas flares. Flare NO<sub>x</sub> emissions are regulated through new source review and BACT. This control measure proposes that, consistent with the all feasible measures measure, older biogas flares be gradually replaced with flares that meet current BACT. Strategies that minimize flaring and associated emissions can also be considered as alternative control options.

**CMB-03 – REDUCTIONS FROM COMMERCIAL SPACE HEATING:** This control measure applies to natural gas-fired commercial space heaters used for

comfort heating. SCAQMD Rule 1111 - NO<sub>x</sub> Emissions from Natural Gas-Fired Fan Type Central Furnaces, regulates space heaters with input rates less than 175,000 Btu/hr. This measure proposes to establish a NO<sub>x</sub> emission limit for new space heaters for commercial applications, which can be achieved through the use of low-NO<sub>x</sub> burners or other technologies.

#### Petroleum Operations and Fugitive VOC Emissions

This category pertains primarily to operations and materials associated with the petroleum, chemical, and other industries. Within this category, there is one proposed control measure targeting fugitive VOC emissions with improved leak detection and repair. Other proposed measures include reductions from vacuum truck venting, and propane transfer and dispensing.

**FUG-01 – VOC REDUCTIONS FROM VACUUM TRUCKS:** This control measure seeks to reduce emissions from the venting of vacuum trucks. Emissions from such operations can be further reduced through the utilization of control technologies, including but not limited to, carbon adsorption systems, internal combustion engines, thermal oxidizers, refrigerated condensers and liquid scrubbers. Additionally, implementation of a leak detection and repair (LDAR) program may further reduce fugitive emissions.

**FUG-02 - EMISSION REDUCTION FROM LPG TRANSFER AND DISPENSING:** The District recently adopted Rule 1177 - Liquefied Petroleum Gas (LPG) Transfer and Dispensing (June 2012). The rule requires use of low-emission fixed liquid level gauges or equivalent alternatives during filling of LPG-containing tanks and cylinders, use of low-emission connectors, routine leak checks and repairs of LPG transfer and dispensing equipment. The purpose of this control measure is to reduce fugitive VOC emissions associated with the transfer and dispensing of LPG by expanding rule applicability to include LPG transfer and dispensing at currently exempted facilities such as refineries, marine terminals, natural gas processing plants and pipeline transfer stations, as well as facilities that conduct fill-by-weight techniques.

**FUG-03 – FURTHER REDUCTIONS FROM FUGITIVE VOC EMISSIONS:** This control measure seeks to broaden the applicability of improved leak detection and repair (LDAR) programs to remove additional fugitive VOC emissions. Areas for further study may include, but are not limited to, Rule 1142 - Marine Vessel Tank Operations, and wastewater separators. This control measure would explore the

opportunity of incorporating a recently developed advanced optical gas imaging technology to detect leaks (Smart LDAR) to more easily identify and repair leaks in a manner that is less time consuming and labor intensive. Additionally, vapor recovery systems are currently required to be 95% control efficient. In an effort to further reduce emissions from these operations, this control measure would explore opportunities and the feasibility of further improving the collection/control efficiency of existing control systems resulting in additional VOC reductions.

#### Multiple Component Sources

There are a total of three stationary source 8-hour ozone measures proposed in this category. The first measure seeks reductions of all feasible measures after such an assessment is made. Another measure seeks further emission reductions from greenwaste processing, which is chipping and grinding not associated with composting. The third measure seeks to minimize emissions during equipment startup and shutdown and to reduce emissions by applying the state requirement of all feasible control measures.

#### **MCS-01 – APPLICATION OF ALL FEASIBLE MEASURES ASSESSMENT:**

This control measure is to address the state law requirement for all feasible measures for ozone. Existing rules and regulations for pollutants such as VOC, NO<sub>x</sub>, SO<sub>x</sub> and PM reflect current best available retrofit control technology (BARCT). However, BARCT continually evolves as new technology becomes available that is feasible and cost-effective. Through this proposed control measure, the District would commit to the adoption and implementation of the new retrofit control technology standards. Finally, staff will review actions taken by other air districts for applicability in our region.

#### **MCS-02 - FURTHER EMISSION REDUCTIONS FROM GREENWASTE PROCESSING (CHIPPING AND GRINDING NOT ASSOCIATED WITH COMPOSTING):**

Chipped or ground greenwaste and/or wood waste has a potential to emit VOCs when being stockpiled or land-applied for various purposes. Chipping and grinding is a process to mechanically reduce the size of greenwaste and wood waste. The District rules currently establish best management practices (BMPs) for greenwaste composting and related operations under Rule 1133.1 – Chipping and Grinding Activities, and Rule 1133.3 – Greenwaste Composting Operations. During rule development, stakeholders raised the need to develop a holistic approach to identifying and accounting for emissions from all greenwaste streams and reducing potential emissions from greenwaste material handling operations at chipping and

grinding facilities and other related facilities, and not just the ones associated with composting operations. This control measure would seek to establish additional Best Management Practices (BMPs) for handling processed or unprocessed greenwaste material by greenwaste processors, haulers, and operators who inappropriately stockpile material or directly apply the material to land. The implementation of the control measure would be in two phases. First, the existing database would be reviewed to refine the greenwaste material inventory, and second, staff would potentially develop a rule to incorporate technically feasible and cost-effective BMPs or controls.

**MCS-03 - IMPROVED START-UP, SHUTDOWN AND TURNAROUND PROCEDURES:** This proposed control measure seeks to reduce emissions during equipment startup, shutdown, and turnaround. Opportunities for further reducing emissions from start-up, shut-down and turnaround activities potentially may exist at refineries as well as other industries. Examples of possible areas for improvement may include best management practices, better engineering and equipment design, diverting or eliminating process streams that are vented to flares, and installation of redundant equipment to increase operational reliability. This measure will be implemented through a two-phase effort to first collect/refine emissions and related data and then, based on the data collected, assess viable controls, if appropriate.

#### Incentive Programs

There are two proposed incentive programs within this category. The first program seeks to provide incentives for new and existing facilities to install and operate clean, more-efficient combustion equipment beyond what is currently required. The second program provides expedited permitting processing and development of applicable CEQA documentation if a company manufactures zero or near-zero emission technology.

**INC-01: ECONOMIC INCENTIVE PROGRAMS TO ADOPT ZERO AND NEAR-ZERO TECHNOLOGIES:** The primary objective of this measure is to develop programs that promote and encourage adoption and installation of cleaner, more-efficient combustion equipment with a focus on zero and near-zero technologies, such as boilers, water heaters and commercial space heating, through economic incentive programs, subject to the availability of public funding. Incentives may include grants for new purchases of equipment as well as loan programs in areas where long-term cost savings from increased efficiency are achieved.

**INC-02: EXPEDITED PERMITTING AND CEQA PREPARATION FACILITATING THE MANUFACTURING OF ZERO AND NEAR-ZERO TECHNOLOGIES:** This proposed measure is aimed at providing incentives for companies to manufacture zero and near-zero emission technologies locally, thus populating the market, potentially lowering the purchase cost, and increasing demand. With availability and usage of such technologies, air quality benefits will be achieved. This proposed measure focuses on two elements: 1) process the required air permit(s) in an expedited procedure; and 2) prioritize the preparation, circulation and certification of the applicable CEQA document. A stakeholder process will be initiated to design the program and collaborate with other existing District or local programs.

#### Educational Programs

There is one proposed educational program within this category.

**EDU-01: FURTHER CRITERIA POLLUTANT REDUCTIONS FROM EDUCATION, OUTREACH AND INCENTIVES:** This proposed control measure seeks to provide educational outreach and incentives for consumers to contribute to clean air efforts. Examples include the usage of energy efficient products, new lighting technology, “super compliant” coatings, tree planting, and the use of lighter colored roofing and paving materials which reduce energy usage by lowering the ambient temperature. In addition, this proposed measure intends to increase the effectiveness of energy conservation programs through public education and awareness as to the environmental effects and benefits from conservation. Finally, educational and incentive tools to be used include comparison of energy usage and efficiency, social media, public/private partnerships.

#### **Proposed Mobile Source 8-hour Ozone Measures**

Depending on the mobile source sector and the proposed control approach, District staff analyzed the need to accelerate the penetration of cleaner engine technologies. The proposed mobile source 8-hour ozone measures are based upon a variety of control technologies that are commercially available and/or technologically feasible to implement in the next several years. The focus of these measures includes accelerated retrofits or replacement of existing vehicles or equipment, acceleration of vehicle turnover through voluntary vehicle retirement programs, and greater use of cleaner fuels in the near-term. In the longer-term, in order to attain the federal ozone ambient air quality standard, there is a need to increase the penetration and

deployment of near-zero and zero-emission vehicles such as plug-in hybrids, battery-electric, and fuel cells, even further use of cleaner fuels (either alternative fuels or new formulations of gasoline and diesel fuels), and additional emission reductions from locomotive and aircraft engines.

Ten measures are proposed as actions to reduce mobile source emissions and seven additional measures are proposed to accelerate the development and deployment of near-zero and zero-emission technologies for goods movement related sources and off-road equipment. The measures call for greater emission reductions through accelerated turnover of older vehicles to the cleanest vehicles currently available and increased penetration of commercially-available near-zero and zero-emission technologies through existing incentives programs.

Drawing upon the recent draft “Vision for Clean Air: A Framework for Air Quality and Climate Planning” (or Vision), a document produced jointly between the District staff, the California Air Resources Board, and the San Joaquin Valley Air Pollution Control District, seven measures are proposed to further the development of zero- and near-zero emission technologies for on-road and off-road mobile sources. The draft Vision document discusses the need to accelerate deployment of the cleanest combustion technologies and zero- and near-zero emission technologies earlier to meet federal ambient air quality standards and long-term climate goals. The document provides actions for several key transportation sectors and off-road equipment.

Partial-zero and zero-emission technologies are rapidly being introduced into the on-road light- and medium-duty vehicle categories in large part due to the CARB Low Emission Vehicle (LEV) and the Zero-Emission Vehicle (ZEV) Regulations. In addition, next-generation electric hybrid trucks are being commercialized for light-heavy and medium-heavy heavy-duty on-road vehicles. However, additional research and demonstration are needed to commercialize zero- and near-zero emission technologies for the heavier heavy-duty vehicles (with gross vehicle weight ratings greater than 26,000 lbs.).

For many of the off-road mobile sources such as locomotives, cargo handling equipment, commercial harbor craft, and off-road equipment, some form of “all zero-emission range” is feasible to demonstrate and implement beginning in the latter part of this decade. For other sectors such as marine vessels and aircraft, the development of cleaner combustion technologies beyond existing emission standards will be needed. The Vision document provides a broad discussion of the potential zero- and

near-zero technologies or cleaner combustion technologies that could be demonstrated in the near-term. The potential technologies are discussed further in each of the “ADV” measures. A summary of the 17 measures is provided in Table 4-6.

**TABLE 4-6**

List of Adoption/Implementation Dates and Estimated Emission Reductions from Mobile Source 8-hour Ozone Measures

<b>ON-ROAD MOBILE SOURCES</b>					
<b>Number</b>	<b>Title</b>	<b>Adoption</b>	<b>Implementation Period</b>	<b>Implementing Agency</b>	<b>Reduction (tpd) by 2023</b>
ONRD-01	Accelerated Penetration of Partial Zero-Emission and Zero-Emission Vehicles [VOC, NOx, PM]	N/A	Ongoing	CARB, SCAQMD	TBD <sup>a</sup>
ONRD-02	Accelerated Retirement of Older Light- and Medium-Duty Vehicles [VOC, NOx, PM]	N/A	Ongoing	CARB, Bureau of Automotive Repair, SCAQMD	TBD <sup>a</sup>
ONRD-03	Accelerated Penetration of Partial Zero-Emission and Zero-Emission Light-Heavy- and Medium-Heavy-Duty Vehicles [NOx, PM]	N/A	Ongoing	CARB, SCAQMD	TBD <sup>a</sup>
ONRD-04	Accelerated Retirement of Older On-Road Heavy-Duty Vehicles [NOx, PM]	2014	2015-2023	CARB, SCAQMD	TBD <sup>a,b</sup>
ONRD-05	Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards [NOx, PM]	2014	2015-2020	CARB	0.75 [NOx] 0.025 [PM2.5]

**TABLE 4-6 (continued)**

List of Adoption/Implementation Dates and Estimated Emission Reductions  
from Mobile Source 8-hour Ozone Measures

<b>OFF-ROAD MOBILE SOURCES</b>					
<b>Number</b>	<b>Title</b>	<b>Adoption</b>	<b>Implementation Period</b>	<b>Implementing Agency</b>	<b>Reduction (tpd) by 2023</b>
OFFRD-01	Extension of the SOON Provision for Construction/Industrial Equipment [NOx]	N/A	Ongoing	SCAQMD	7.5
OFFRD-02	Further Emission Reductions from Freight Locomotives [NOx, PM]	Ongoing	2015 – 2023	CARB, U.S. EPA, San Pedro Bay Ports	12.7 [NOx] <sup>c</sup> 0.32 [PM2.5] <sup>c</sup>
OFFRD-03	Further Emission Reductions from Passenger Locomotives [NOx, PM]	Ongoing	Beginning 2014-2023	SoCal Regional Rail Authority	3.0 [NOx] <sup>d</sup> 0.06 [PM2.5] <sup>d</sup>
OFFRD-04	Further Emission Reductions from Ocean-Going Marine Vessels While at Berth [NOx, SOx, PM]	2014	Ongoing	San Pedro Bay Ports, CARB, SCAQMD	TBD <sup>a</sup>
OFFRD-05	Emission Reductions from Ocean-Going Marine Vessels [NOx]	N/A	Ongoing	San Pedro Bay Ports, CARB, U.S. EPA	TBD <sup>a</sup>
<b>ADVANCED CONTROL TECHNOLOGIES</b>					
ADV-01	Actions for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles [NOx]	N/A	2012 and on	SCAQMD, San Pedro Bay Ports, CARB, U.S. EPA	TBD <sup>e</sup>
ADV-02	Actions for the Deployment of Zero- and Near-Zero Emission Locomotives [NOx]	N/A	2012 and on	SCAQMD, San Pedro Bay Ports, CARB, U.S. EPA	TBD <sup>e</sup>
ADV-03	Actions for the Deployment of Zero- and Near-Zero Emission Cargo Handling Equipment [NOx]	N/A	2012 and on	SCAQMD, San Pedro Bay Ports, CARB, U.S. EPA	TBD <sup>e</sup>
ADV-04	Actions for the Deployment of Cleaner Commercial Harborcraft [NOx]	N/A	2012 and on	SCAQMD, San Pedro Bay Ports, CARB, U.S. EPA	TBD <sup>e</sup>

**TABLE 4-6 (concluded)**

List of Adoption/Implementation Dates and Estimated Emission Reductions  
from Mobile Source 8-hour Ozone Measures

<b>ADVANCED CONTROL TECHNOLOGIES</b>					
<b>Number</b>	<b>Title</b>	<b>Adoption</b>	<b>Implementation Period</b>	<b>Implementing Agency</b>	<b>Reduction (tpd) by 2023</b>
ADV-05	Actions for the Deployment of Cleaner Ocean-Going Marine Vessels [NO <sub>x</sub> ]	N/A	2012 and on	SCAQMD, San Pedro Bay Ports, CARB, U.S. EPA	TBD <sup>e</sup>
ADV-06	Actions for the Deployment of Cleaner Off-Road Equipment [NO <sub>x</sub> ]	N/A	2012 and on	SCAQMD, CARB, U.S. EPA	TBD <sup>e</sup>
ADV-07	Actions for the Deployment of Cleaner Aircraft Engines [NO <sub>x</sub> ]	N/A	2012 and on	SCAQMD, CARB, FAA, U.S. EPA	TBD <sup>e</sup>

- Emission reductions will be determined after projects are identified and implemented.
- Reductions achieved locally in Mira Loma region.
- Emission reductions provided are updated from the 2007 SIP values reflecting a revised future year base emission levels. The reductions are not included in the 2012 AQMP SIP submittal
- Submitted into the SIP once technically feasible and cost effective options are confirmed.
- Emission reduction will be quantified after projects are demonstrated.

### On-Road Mobile Source Measures

Five on-road mobile source control measures are proposed. The first two measures focus on on-road light- and medium-duty vehicles operating in the South Coast Air Basin. By 2023, it is estimated that about 12 million vehicles will be operating in the Basin. The first measure would implement programs to accelerate the penetration and deployment of partial zero-emission and zero-emission vehicles in the light- and medium-duty vehicles categories. The second control measure would seek to accelerate retirement of older gasoline and diesel powered vehicles up to 8,500 gross vehicle weight (GVW). These vehicles include passenger cars, sports utility vehicles, vans, and light duty pick-up trucks.

The remaining three measures focus on heavy-duty vehicles. The first of these measures seeks additional emission reductions from the early deployment of partial zero-emission and zero-emission light- and medium-heavy-duty vehicles with gross vehicle weights between 8,501 pounds to 26,000 pounds. The second control

measure for heavy-duty vehicles seeks additional emissions reductions from older, pre-2010 heavy-duty vehicles beyond the emission reductions targeted in CARB's Truck and Bus Regulation. Additional emission reductions could be achieved if an additional percentage of the oldest, pre-2010 heavy duty vehicles not subject to the Truck and Bus Regulation are targeted. The fifth on-road measure seeks emission reductions at near-dock railyards through the deployment of zero-emission heavy-duty vehicles. District staff is recommending a minimum funding level of \$85 million per year for incentives to implement on-road mobile source measures.

#### Off-Road Mobile Source Measures

Five control measures that seek further emission reductions from off-road mobile sources and industrial equipment are proposed. Transportation sources such as aircraft, locomotives, and marine vessels are associated with anticipated economic growth not only in the Basin, but also nationwide. These sources are principally regulated by federal and state agencies. In addition, certain local actions can result in emission reductions beyond the emissions standard setting authority of the state and U.S. EPA. The first measure calls for the continuation of the Surplus Off-Road Opt-In for NO<sub>x</sub> (SOON) provision of the statewide In-Use Off-Road Diesel Fleet Regulation beyond 2014. The SOON provision implemented to-date has realized additional NO<sub>x</sub> reductions beyond the statewide regulation. The second and third measures call for additional emission reductions from freight and passenger locomotives. The fourth measure seeks additional emission reductions from ocean-going vessels while at berth. The fifth measure recognizes the efforts that the Ports of Los Angeles and Long Beach are implementing to incentivize Tier 2 and Tier 3 ocean-going vessels to call at the ports. District staff is recommending a minimum funding level of \$30 million per year for incentives to implement off-road mobile source measures.

#### Actions to Deploy Advanced Control Technologies

Seven additional measures are proposed to deploy the cleanest control technologies as early as possible and to foster the development and deployment of near-zero and zero-emission technologies. Many of these actions have already begun. However, additional research and development will be needed that will lead to commercial deployment of control technologies that achieve emission levels below current adopted emission standards. Other near-zero and zero-emission technologies that are

commercially available will require infrastructure development to facilitate their deployment.

The term “near-zero” technology is not defined in these actions. The term’s specific meaning could depend on the source category and feasible technologies. The actions needed to deploy zero-emission technologies, “near-zero” emission technologies, and the next generation of cleaner combustion engines will be discussed in the development of the proposed measures and future AQMPs. To initiate the development of cleaner engines (either through in-cylinder or after-treatment controls or in combination with hybrid systems that lead to further criteria pollutant emission reductions), District staff is proposing that optional NO<sub>x</sub> standards be adopted. Having such optional standards will facilitate the early development of cleaner technologies and assist to deploy these technologies as soon as possible. They would be set by the level of emission reductions commercially achievable in the near-term. Several of the technologies to achieve emission levels lower than current standards, or zero-emission levels, are currently available and are potentially transferrable to various vehicle vocations and in-use applications. However, further research and demonstration are needed for many of these technologies to evaluate their performance prior to commercialization. Each measure contains a timeline for actions to bring about the zero-emission or cleaner technologies.

The District staff, U.S. Department of Energy, U.S. Environmental Protection Agency, Federal Aviation Administration, California Air Resources Board, California Energy Commission, engine manufacturers, advanced engine control developers, and electric hybrid systems developers have been discussing potential technologies to further reduce engine exhaust emissions or eliminate exhaust emissions entirely. Public forums such as technology symposiums will be used to solicit public input on technology development as part of the proposed actions.

The following text provides a brief description of the District staff’s proposed mobile source measures:

**ONRD-01 – ACCELERATED PENETRATION OF PARTIAL ZERO-EMISSION AND ZERO EMISSION VEHICLES:** This measure proposes to continue incentives for the purchase of zero-emission vehicles and hybrid vehicles with a portion of their operation in an “all electric range” mode. The state Clean Vehicle Rebate Pilot (CVRP) program is proposed to continue from 2015 to 2023 with a proposed funding for up to \$5,000 per vehicle. The proposed measure seeks

to provide funding assistance for up to 1,000 zero-emission or partial-zero emission vehicles per year.

**ONRD-02 – ACCELERATED RETIREMENT OF OLDER LIGHT- AND MEDIUM-DUTY VEHICLES:** This proposed measure calls for promoting the permanent retirement of older eligible vehicles through financial incentives currently offered through local funding incentive programs and the AB 118 Enhanced Fleet Modernization Program (EFMP). The proposed measure seeks to retire up to 2,000 older light- and medium-duty vehicles (up to 8,500 lbs gross vehicle weight) per year. Funding incentives of up to \$2,500 per vehicle are proposed for the scrapping of the vehicle, which may include a replacement voucher for a newer or new vehicle.

**ONRD-03 – ACCELERATED PENETRATION OF PARTIAL ZERO-EMISSION AND ZERO-EMISSION LIGHT-HEAVY- AND MEDIUM-HEAVY-DUTY VEHICLES:** The objective of the proposed action is to accelerate the introduction of advanced hybrid and zero-emission technologies for Class 4 through 6 heavy-duty vehicles. The state is currently implementing a Hybrid Vehicle Incentives Project (HVIP) program to promote zero-emission and hybrid heavy-duty vehicles. The proposed measure seeks to continue the program from 2015 to 2023 to deploy up to 1,000 zero- and partial-zero emission vehicles per year with up to \$25,000 funding assistance per vehicle. Zero-emission vehicles and hybrid vehicles with a portion of their operation in an “all electric range” mode would be given the highest priority.

**ONRD-04 – ACCELERATED RETIREMENT OF OLDER ON-ROAD HEAVY-DUTY VEHICLES:** This proposed measure seeks to replace up to 1,000 heavy-duty vehicles per year with newer or new vehicles that at a minimum, meet the 2010 on-road heavy-duty NO<sub>x</sub> exhaust emissions standard of 0.2 g/bhp-hr. Given that exceedances of the 24-hour PM<sub>2.5</sub> air quality standard occur in the Mira Loma region, priority will be placed on replacing older diesel trucks that operate primarily at the warehouse and distribution centers located in the Mira Loma area. Funding assistance of up to \$35,000 per vehicle is proposed and the level of funding will depend upon the NO<sub>x</sub> emissions certification level of the replacement vehicle. In addition, a provision similar to the Surplus Off-Road Option for NO<sub>x</sub> (SOON) provision of the statewide In-Use Off-Road Fleet Vehicle Regulation will be sought to ensure that additional NO<sub>x</sub> emission reduction benefits are achieved.

**ONRD-05 – FURTHER EMISSION REDUCTIONS FROM HEAVY-DUTY VEHICLES SERVING NEAR-DOCK RAILYARDS:** This proposed control measure calls for a requirement that any cargo container moved between the Ports of Los Angeles and Long Beach to the nearby railyards (the Intermodal Container Transfer Facility and the proposed Southern California International Gateway) be with zero-emission technologies. The measure would be fully implemented by 2020 through the deployment of zero-emission trucks or any alternative zero-emission container movement system such as a fixed guideway system. The measure calls for CARB to either adopt a new regulation or amend an existing regulation to require such deployment by 2020. To the extent the measure can feasibly be extended beyond near-dock railyards, this would be considered for adoption by CARB.

**OFFRD-01 – EXTENSION OF THE SOON PROVISION FOR CONSTRUCTION/INDUSTRIAL EQUIPMENT:** This measure seeks to continue the Surplus Off-Road Option for NOx (SOON) provision of the statewide In-Use Off-Road Fleet Vehicle Regulation beyond 2014 through the 2023 timeframe. In order to implement the SOON program in this timeframe, funding of up to \$30 million per year would be sought to help fund the repower or replacement of older Tier 0 and Tier 1 equipment, with reductions that are considered surplus to the statewide regulation with Tier 4 or cleaner engines.

**OFFRD-02 – FURTHER EMISSION REDUCTIONS FROM FREIGHT LOCOMOTIVES:** The proposed control measure is to meet the commitment in the 2007 SIP for the accelerated use of Tier 4 locomotives in the South Coast Air Basin. The measure calls for CARB to seek further emission reductions from freight locomotives through enforceable mechanisms within its authority to achieve 95 percent or greater introduction of Tier 4 locomotives by 2023.

**OFFRD-03 – FURTHER EMISSION REDUCTIONS FROM PASSENGER LOCOMOTIVES:** This measure recognizes the recent actions by the Southern California Regional Rail Authority (SCRRA or Metrolink) to consider replacement of their existing Tier 0 passenger locomotives with Tier 4 locomotives. The SCRRA adopted a plan that contains a schedule to replace their older existing passenger locomotives with Tier 4 locomotives by 2017. More recently, SCRRA released a Request for Quotes on the cost of new or newly manufactured passenger locomotives with locomotive engines that meet Tier 4 emission levels.

**OFFRD-04 – FURTHER EMISSION REDUCTIONS FROM OCEAN-GOING MARINE VESSELS WHILE AT BERTH:** This measure seeks additional emission reductions from ocean-going marine vessels while at berth. The actions would affect ocean-going vessels that are not subject to the statewide Shorepower Regulation or vessel calls that are considered surplus to the statewide regulation. The measure seeks at a minimum to have an additional 25 percent of vessel calls beyond the statewide regulation to deploy shorepower technologies or alternative forms of emissions reduction as early as possible. Such actions could be implemented through additional incentives programs or through the San Pedro Bay Ports as part of the implementation of the Ports Clean Air Action Plan.

**OFFRD-05 – EMISSION REDUCTIONS FROM OCEAN-GOING MARINE VESSELS:** This measure recognizes the recent actions at the Ports of Los Angeles and Long Beach to initiate an incentives program for cleaner ocean-going vessels to call at the ports. The program has been initiated as part of the San Pedro Bay Ports Clean Air Action Plan. The program will provide financial incentives for cleaner Tier 2 and Tier 3 ocean-going vessels to call at the ports. This measure also recognizes the need to monitor progress under such programs and augment them as necessary to ensure sufficient results. The program will be monitored on annual basis and, if necessary, any adjustments to the program will be made.

**ADV-01 –ACTIONS FOR THE DEPLOYMENT OF ZERO- AND NEAR-ZERO EMISSION ON-ROAD HEAVY-DUTY VEHICLES:** This measure would continue the efforts underway to develop zero-emission and near-zero emission technologies for on-road heavy-duty vehicle applications. Such technologies include, but not limited to, fuel cell, battery-electric, hybrid-electric with all electric range, and overhead catenary systems. Hybrid-electric systems incorporate an engine powered by conventional fuels or alternative fuels such as natural gas. The actions provided in the proposed measure are based on the SCAG 2012 Regional Transportation Plan.

**ADV-02 –ACTIONS FOR THE DEPLOYMENT OF ZERO- AND NEAR-ZERO EMISSION LOCOMOTIVES:** This measure calls for the development and deployment of zero-emission and near-zero emission technologies for locomotives. Such technologies include overhead catenary systems, hybrid locomotives that have some portion of their operation in an “all electric range” mode, and alternative forms of external power such as a battery tender car. The actions provided in the proposed measure are based on the SCAG 2012 Regional

Transportation Plan. The zero-emission technologies could apply to freight and passenger locomotives.

**ADV-03 –ACTIONS FOR THE DEPLOYMENT OF ZERO- AND NEAR-ZERO EMISSION CARGO HANDLING EQUIPMENT:** This measure recognizes the actions underway to develop and deploy zero- and near-zero emission technologies for various cargo handling equipment. The San Pedro Bay Ports are currently demonstrating battery-electric yard tractors. In addition, battery-electric, fuel cell, and hybridized systems could be deployed on smaller cargo handling equipment. In addition, the use of alternative fuels for conventional combustion engines could potentially result in greater emissions benefits.

**ADV-04 –ACTIONS FOR THE DEPLOYMENT OF CLEANER COMMERCIAL HARBORCRAFT:** Several commercial harbor craft operators have begun deployment of hybrid systems in their harbor craft to further reduce criteria pollutant emissions and improve fuel efficiency. Other cleaner technologies include the use of alternative fuels, retrofit of existing older marine engines with selective catalytic converters, and diesel particulate filters. This measure recognizes several efforts between the District and the Ports of Los Angeles and Long Beach to further demonstrate control technologies that could be deployed on commercial harbor craft that could go beyond the statewide Harbor Craft Regulation.

**ADV-05 –ACTIONS FOR THE DEPLOYMENT OF CLEANER OCEAN-GOING MARINE VESSELS:** The Ports of Los Angeles and Long Beach, CARB, and the District have sponsored research and demonstration of various control technologies to further reduce emissions from ocean-going vessels. In addition, the San Pedro Bay Ports Clean Air Action Plan contains a measure to further demonstrate such technologies on ocean-going vessels. This measure recognizes many of these efforts and the need to further demonstrate retrofit technologies on existing ocean-going vessels.

**ADV-06 –ACTIONS FOR THE DEPLOYMENT OF CLEANER OFF-ROAD EQUIPMENT:** The District, Mobile Source Air Pollution Reduction Review Committee (MSRC), and CARB have been conducting an off-road “showcase” program for retrofit technologies to further reduce emissions from older off-road equipment. In addition, several major off-road engine manufacturers are investigating the potential use of hybrid systems to further reduce criteria pollutant and greenhouse gas emissions. Potential advanced technologies include hybrid systems that utilize batteries, fuel cells, or plug-in capabilities, which could result in

lower emissions compared to Tier 4 emission levels when combined with future Tier 4 compliant engines. The measure is implemented by the District, CARB and U.S. EPA.

**ADV-07 –ACTIONS FOR THE DEPLOYMENT OF CLEANER AIRCRAFT ENGINES:** This measure recognizes the efforts of the Federal Aviation Administration’s Continuous Lower Energy, Emissions and Noise (CLEEN) Program. The goal of the CLEEN Program is the development of new aircraft engines that potentially can be up to 60 percent cleaner in NOx emissions than current aircraft engines. The actions under this measure are to continue the development of cleaner aircraft engines and work with the airlines and local airport authorities to develop mechanisms to route the cleanest aircraft to serve the South Coast Air Basin.

## **DISTRICT’S SIP EMISSION REDUCTION COMMITMENT**

The SIP commitment of the Final 2012 AQMP is structured into two components. Reductions from adopted rules and reductions from the 2012 AQMP control measures are divided into commitments for the 24-hr PM2.5 SIP and the 8-hour ozone SIP. Taken together, these reductions are relied upon to demonstrate expeditious progress and attainment of the federal 24-hr PM2.5 standard, and implemented to reduce the black box commitment for the 8-hour ozone standard. The following sections first describe the methodology for SIP emission reduction calculations and the creditable SIP reductions, then describe what procedures will be followed to ensure fulfillment of the commitment.

### **SIP Emission Reduction Tracking**

For purposes of tracking progress in emission reductions, the baseline emissions for the year 2014 (annual average) and 2023 (planning inventory) in the Final 2012 AQMP will be used, regardless of any subsequent new inventory information that reflects more recent knowledge. This is to ensure that the same “currency” is used in measuring progress as was used in designing the Plan. This will provide a fair and equitable measurement of progress. Therefore, it makes no difference whether progress is measured by emission reductions or remaining emissions for a source category. However, the most recent emission inventory information at the time of rule development will continue to be used for calculating reductions, and assessing cost-effectiveness and socioeconomic impacts of the proposed rule. Therefore, for

future rulemaking activity, both the most recent and AQMP inventories will be reported.

Any non-mandatory emissions reductions achieved beyond the existing District regulations are creditable only if they are also SIP-enforceable. Therefore, in certain instances, the District may have to adopt regulations to reflect the existing industry practices in order to claim SIP reduction credit, with the understanding that there may not be additional reductions beyond what has already occurred. Exceptions can be made where reductions are real, quantifiable, surplus to the Final 2012 AQMP baseline inventories, and enforceable through other State and/or federal regulations. Also, any emissions inventory revisions, which have gone through a peer review and public review process, can also be SIP creditable.

### **Reductions from Adopted Rules**

A number of control measures contained in the 2007 AQMP have been adopted as rules. These adopted rules and their projected emission reductions become assumptions in developing AQMP's future year inventories. Although they are not part of the control strategy in the Final 2012 AQMP, continued implementation of those rules is essential in achieving clean air goals and maintaining the attainment demonstration. Table 1-2 of Chapter 1 lists the rules adopted by the District since the adoption of the 2007 AQMP and their expected emission reductions.

### Reductions from District's Stationary Source Control Measures

For purposes of implementing an approved SIP, the District is committed to adopt and implement control measures that will achieve, in aggregate, emission reductions specified in Tables 4-7 and 4-8 to demonstrate expeditious implementation of measures toward meeting the federal 2006 24-hr PM<sub>2.5</sub> standard and the 1997 8-hour ozone standard, respectively. Emission reductions achieved in excess of the amount committed to in a given year can be applied to the emission reduction commitments of subsequent years. The District is committed to adopt the control measures in Tables 4-2 and 4-4 unless these measures or a portion thereof are found infeasible and other substitute measures that can achieve equivalent reductions in the same adoption or implementation timeframes are adopted. Findings of infeasibility will be made at a regularly scheduled meeting of the District Governing Board with proper public notification. For purposes of the SIP commitment, infeasibility means that the proposed control technology is not reasonably likely to be available by the

implementation date in question, or achievement of the emission reductions by that date is not cost-effective. It should be noted that the reductions in Tables 4-7 and 4-8 are committed only to the extent needed to achieve attainment by 2014 and if any substitution is needed, the alternative measures will need to achieve the same emission reductions or air quality benefit. The District acknowledges that this commitment is enforceable under Section 304(f) of the federal Clean Air Act. U.S. EPA will not credit SIP reductions unless the control measures are adopted and approved into the SIP at the time of their action on the plan.

#### *Adoption and Implementation of District's Stationary Source Control Measures*

As a partial response to concerns raised by the regulated community that costly controls may be required to meet the SIP obligations, the District proposes to establish a threshold of \$16,500 per ton of VOC and \$22,500 per ton of NOx reduction for tiered levels of analysis. Specifically, proposed rules with an average cost-effectiveness above the threshold will trigger a more rigorous average cost-effectiveness, incremental cost-effectiveness, and socioeconomic impact analysis. A public review and decision process will be instituted to seek lower cost alternatives. In addition, the District staff, with input from stakeholders, will attempt to develop viable control alternatives within the industry source categories that a rule is intended to regulate. If it is determined that control alternatives within the industry source category are not feasible, staff will perform an evaluation of the control measure as described in the next paragraph. Viable alternatives shall be reviewed by the District Governing Board at a public meeting no less than 90 days prior to rule adoption and any needed direction will be given back to staff for further analysis. During this review process, incremental cost-effectiveness scenarios and methodology will be specified, and industry-specific affordability issues will be identified as well as possible alternative control measures. The District Governing Board may adopt the original or an alternative that is consistent with state and federal law. In addition, staff shall include in all set hearing items a notification that proposed rules do or do not exceed the cost threshold.

#### *Adoption and Implementation of Alternative/Substitute Measures*

Under the Final 2012 AQMP, the District will be allowed to substitute District stationary source measures in Tables 4-2 and 4-4 with other measures, provided the overall equivalent emission reductions by the adoption and implementation dates in Tables 4-2 and 4-4 are maintained and the applicable measure in Tables 4-2 and 4-4 is deemed infeasible. In order to provide meaningful public participation, when new

control concepts are introduced for rule development, the District is committed to provide advanced public notification beyond its regulatory requirements (i.e., through its Rule Forecast Report). The District will also report quantitatively on the AQMP's implementation progress annually at its regularly scheduled Governing Board meetings. Included in the reports will be any new control measures being proposed or measures, or portions thereof, that have been found to be infeasible and the basis of such finding. In addition, at the beginning of the year, any significant emission reduction related rules to be considered would be listed in the Board's Rule Forecast Report. Upon any finding of a new feasible control measure to substitute for a measure deemed infeasible, rule development will be completed no later than 12 months from the adoption date of the control measure substituted, and implementation of the new measure will occur no later than two years from the final implementation date of the measure substituted. The existing rule development outreach efforts such as public workshops, stakeholder working group meetings or public consultation meetings will continue to solicit public input. In addition, if additional technical analysis, including source testing, indicates that actual emissions are less than previously estimated, the reductions would then be creditable toward SIP commitments. In order for reductions from improved emission calculation methodologies to be SIP creditable, a public review process will also be instituted to solicit comments and make appropriate revisions, if necessary.

**TABLE 4-7**  
 24-Hr PM<sub>2.5</sub> SIP Basin-wide Emission Reductions Commitment  
 to be Achieved through the District’s Regulatory Programs  
 (2014, Average Annual Day, tons per day)

YEAR	VOC		PM <sub>2.5</sub>		NO <sub>x</sub>		SO <sub>x</sub>	
	Based on Adoption Date	Based on Imple. Date <sup>a</sup>	Based on Adoption Date	Based on Imple. Date <sup>a</sup>	Based on Adoption Date	Based on Imple. Date <sup>a</sup>	Based on Adoption Date	Based on Imple. Date <sup>a</sup>
2013	---	---	11.7 <sup>b</sup>	---	---	---	---	---
2014	---	---	---	11.7 <sup>b</sup>	---	---	---	---
<b>TOTAL</b>			<b>11.7<sup>b</sup></b>	<b>11.7<sup>b</sup></b>				

<sup>a</sup> Represents the final, full implementation date; typically a rule contains multiple implementation dates.

<sup>b</sup> Represents winter episodic emissions.

**TABLE 4-8**  
 2007 Ozone SIP Emission Reductions Commitment to be Achieved Through the District’s  
 Stationary and Mobile Source Regulatory Programs  
 (2023, Planning Inventory, tons per day)

YEAR	VOC		NO <sub>x</sub>	
	Based on Adoption Date	Based on Implementation Date <sup>a</sup>	Based on Adoption Date	Based on Implementation Date <sup>a</sup>
2013	---	---	7.5	---
2014	0.80	---	---	---
2015	1	---	3	---
2016	4	0.8	0.2	---
2017	---	1	---	---
2018	---	2	---	0.2
2019	---	---	---	---
2020	---	2	---	3
2021	---	---	---	---
2022	---	---	---	---
2023	---	---	---	7.5
<b>TOTAL</b>	<b>5.8</b>	<b>5.8</b>	<b>10.7</b>	<b>10.7</b>

<sup>a</sup> Represents the final, full implementation date; typically a rule contains multiple implementation dates.

**TABLE 4-9**

Emission Reductions Commitment to be Achieved Through CARB's Regulatory Programs  
(2023, Planning Inventory, tons per day)

YEAR	NOx	
	Based on Adoption Date	Based on Implementation Date <sup>a</sup>
2013		---
2014	0.75	---
2015	---	---
2016	---	---
2017	---	---
2018	---	---
2019	---	---
2020	---	0.75
2021	---	---
2022	---	---
2023	---	
<b>TOTAL</b>	<b>0.75</b>	<b>0.75</b>

<sup>a</sup> Represents the final, full implementation date; typically a rule contains multiple implementation dates.

## OVERALL EMISSION REDUCTIONS

A summary of emission reductions for the proposed control measures for the years 2014 and 2023 is provided in Tables 4-10 through 4-11. These reductions reflect the emission reductions associated with implementation of control measures under local, State, and federal jurisdiction. Emission reductions represent the difference between the projected baseline and the remaining emissions. Table 4-10 identifies projected reductions based on the annual average inventory for directly emitted PM<sub>2.5</sub> and its precursors (NO<sub>x</sub>, and SO<sub>x</sub>), and VOC for basin-wide stationary and mobile control measures. It represents the level of control needed to achieve the federal 2006 24-hr PM<sub>2.5</sub> standard by 2014. For attainment of the 1997 ozone standard by 2023, Table 4-11 identifies projected reductions based on the summer planning inventory for VOC and NO<sub>x</sub> emissions as an ongoing effort to reduce reliance on the Section 182(e)(5) measures in the 2007 AQMP.

**TABLE 4-10**

Emission Reductions for 2014 Based on Average Annual Emissions Inventory  
(tons per day)

SOURCES	VOC	NOx	SOx	PM2.5
Year 2014 Baseline <sup>1</sup>	451	506	18	70
Adjustments to Baseline <sup>2</sup>	0.28	16	---	0.46
Emission Reductions:				
Stationary Sources	---	---	---	12 <sup>3</sup>
Mobile Sources	---	---	---	---
TOTAL Reductions (all measures)	---	---	---	12 <sup>3</sup>
2014 Remaining Emissions	<b>451</b>	<b>490</b>	<b>18</b>	<b>58</b>

<sup>1</sup>Emission assumptions from SCAG's 2012 Regional Transportation Plan are already reflected in the AQMP baseline, including TCMs.

<sup>2</sup>Emissions reductions from executed contracts under mobile source incentive programs (Proposition 1B, Carl Moyer, AB1493)

<sup>3</sup>Based on episodic winter day.

**TABLE 4-11**

Emission Reductions for 2023 Based on  
Summer Planning Inventory (tons per day)

SOURCES	VOC	NOx
Year 2023 Baseline <sup>1</sup>	438	319
Emission Reductions:		
Stationary Sources	6	3
Mobile Sources	---	8
TOTAL Reductions (all measures)	6	11
2023 Remaining Emissions	<b>432</b>	<b>308</b>

<sup>1</sup>Emission assumptions from SCAG's 2012 Regional Transportation Plan are already reflected in the AQMP baseline, including TCMs.

## IMPLEMENTATION

Achieving clean air objectives requires the effective and timely implementation of the control measures. Similar to approaches taken by previous AQMPs, the SIP commitment is to bring each control measure for regulatory consideration in a specified time frame. The time frame is based on the ability to implement certain

control strategies that will result in the reductions necessary to demonstrate attainment by the required attainment date. There is a commitment to achieve a total emission reduction target, with the ability to substitute for control measures deemed infeasible, so long as equivalent reductions are met by other means. These measures are also designed to satisfy the federal Clean Air Act requirement of Reasonably Available Control Technologies [Section 172(c)], and the California Clean Air Act requirement of Best Available Retrofit Control Technologies (BARCT) [Health and Safety Code Section 40440(b)(1)].

The adoption and implementation schedule of the control measures proposed in the Final 2012 AQMP can be found in Tables 4-2, 4-4 and 4-6. Multiple agencies are necessary for implementation of the mobile source ozone measures in Table 4-6. This section describes each agency's area of responsibility.

### **Responsible Agencies**

Implementation of the control strategies requires a cooperative partnership of governmental agencies at the federal, state, regional and local level. These agencies form the four cornerstones from which implementation programs will evolve.

At the federal level, the U.S. EPA and sometimes other agencies are charged with reducing emissions from federally controlled sources such as commercial aircraft, trains, marine vessels, and other sources. At the state level, CARB is primarily responsible for reducing emissions from motor vehicles and consumer products.

At the regional level, the District is responsible for the overall development and implementation of the AQMP. The District is specifically authorized to reduce the emissions from stationary, point, and some area sources such as coatings and industrial solvents. Emission reductions are also sought through funding programs designed to accelerate vehicle turnover and the purchase of cleaner vehicles. In addition, the District regulates indirect sources under Health and Safety Code Sections 40716 (a)(1) and 40440(b)(3). As a means of achieving further emission reductions, the District may seek additional authority to regulate sources that have not been completely under the District's jurisdiction in the past such as marine vessels, consumer products, and other on-road and off-road sources. The District implements its responsibilities with participation from the regulated community through an extensive rule development and implementation program. This approach maximizes the input of those parties affected by the proposed rule through consultation meetings, public workshops, and ongoing working groups.

At the regional level, the Southern California Association of Governments (SCAG) assists sub-regional and local governments in playing a formative role in the air quality elements of transportation planning. In addition, local governments serve an important role in developing and implementing the transportation control measures that are included in the Final 2012 AQMP. SCAG is responsible for providing the socioeconomic forecast (e.g., population and growth forecasts) upon which the Plan is based. SCAG also provides assessments for conformity of regionally significant transportation projects with the overall Plan and is responsible for the adoption of the Regional Transportation Plan (RTP) and the Regional Transportation Improvement Program (RTIP) which include growth assumptions and transportation improvement projects that could have significant air quality impacts, and transportation control measures as required by the CAA.

Table 4-12 list the responsibilities of the key agencies involved in the implementation of the 2012 AQMP.

**TABLE 4-12**

Agencies Responsible for Implementation  
of the 2012 AQMP for the South Coast Air Basin

AGENCY	PRINCIPAL RESPONSIBILITIES
U.S. EPA	<ul style="list-style-type: none"> <li>• Mobile vehicle emission standards;</li> <li>• Airplanes, trains, and ships;</li> <li>• New off-road construction &amp; farm equipment below 175 hp</li> </ul>
CARB	<ul style="list-style-type: none"> <li>• On-road/Off-road vehicles (emission standards and in-use fleets as authorized under Section 209(e) of the Clean Air Act)</li> <li>• Motor vehicle fuels;</li> <li>• Consumer products</li> </ul>
SCAQMD	<ul style="list-style-type: none"> <li>• Stationary (e.g., industrial/commercial) and area sources;</li> <li>• Indirect sources;</li> <li>• Certain mobile sources (e.g., in-use fleet regulations, incentives for accelerated vehicle turnover, reduction in average vehicle ridership, etc.)</li> </ul>
SCAG	<ul style="list-style-type: none"> <li>• Conformity assessments for Regional Transportation Plan and other transportation projects;</li> <li>• Regional Transportation Improvement Program;</li> <li>• Transportation Control Measures</li> </ul>
Local Government	<ul style="list-style-type: none"> <li>• Transportation and local government actions (i.e., land use approvals &amp; ports);</li> <li>• Transportation facilities</li> </ul>