Appendix I

Triennial Progress Report and Plan Update for State Ozone Standards

2013 Plan for the Revoked 1-Hour Ozone Standard
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APPENDIX I TRIENNIAL PROGRESS REPORT AND PLAN UPDATE FOR STATE OZONE STANDARDS

I.1 INTRODUCTION

The California Clean Air Act (CCAA) requires areas that have not attained state ambient air quality standards for ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide to prepare plans to attain these standards by the earliest practicable date.[1] The San Joaquin Valley Air Pollution Control District (District) has attained each of these standards with the exception of ozone for the San Joaquin Valley (Valley) air basin. The California Air Resources Board (ARB) has designated the Valley as severe nonattainment of the state 1-hour ambient air quality standard for ozone.[2]

The California Health & Safety Code (CH&SC) further requires all districts designated as nonattainment of state ambient air quality standards to prepare and submit a plan for attaining and maintaining the standard to ARB.[3] Subsequent to the approval of such plans, the CH&SC requires air districts to prepare a report every three years summarizing progress in meeting the schedules for developing, adopting, and implementing the air pollution control measures contained in each district's plan.[4] In addition to assessing the progress made in the reporting period, the CH&SC also requires air districts designated as nonattainment to submit attainment plan revisions to correct for deficiencies in meeting the air quality standard and to incorporate new data and projections into the attainment plan.[5]

This triennial assessment and plan update is included as an appendix to the *2013 Plan for the Revoked 1-Hour Ozone Standard* to satisfy requirements of the CH&SC with respect to ozone and documents progress toward attainment through requirements stipulated in the District's *1991 Air Quality Attainment Plan* (adopted by the District in January 1992). This appendix also documents that the *2013 Plan for the Revoked 1-Hour Ozone Standard* meets the requirements for the triennial plan update, thus preventing backsliding and reflecting updated emissions and attainment projections based on the District's multi-faceted control strategies.

This appendix demonstrates the District's continued compliance with state requirements for continued progress toward the state ozone standards and related triennial progress report requirements over the course of two three-year reporting periods, 2006 through 2008 and 2009 through 2011.

[1] California Health and Safety Code (CH&SC) §40911(a)
[2] The State 1-hour ozone standard is 0.09 parts per million averaged over one hour. The standard is attained when each monitor in the region has no exceedances during the previous three calendar years.
[3] CH&SC §40911
[4] CH&SC §40924(b)
[5] CH&SC §40925

Following ARB guidance,[6,7] triennial progress reports document the overall effectiveness of air quality programs, the quantity of emissions reductions achieved in the preceding three-year period, the rate of emissions growth, and projected rate of emissions growth, and air quality improvement. As such, this appendix includes air quality indicators (provided by ARB); emissions reductions of control measures adopted during the reporting period; incentive program information; mobile source control measures, including vehicle miles traveled offset thresholds; and emissions projections through 2020.

Based on the information and analysis herein, the District continues to make progress toward attainment of the state 1-hour ambient air quality standard for ozone.

I.2 OZONE AIR QUALITY INDICATORS

There are a number of ways to evaluate how ozone levels have changed over time and to assess progress in attaining the state ozone standard. ARB identified three air quality indicators for air districts to use in their triennial updates to ozone attainment plans. These indicators included *expected peak day concentration* (EPDC), *area-weighted exposure* (AWE), and *population-weighted exposure* (PWE). General descriptions of all three indicators, as well as the calculation procedures, are provided below.

I.2.1 Expected Peak Day Concentration (EPDC)

The EPDC represents the maximum ozone concentration expected to occur once per year, on average. The EPDC is based on a statistical calculation and uses ambient ozone data collected at each monitoring site in the San Joaquin Valley (Valley) air basin. The EPDC is useful for tracking air quality progress at individual monitoring locations. Because it is based on a robust statistical calculation, it is relatively stable, thereby providing a trend indicator that is not highly influenced by year-to-year changes in meteorology.

The EPDC calculation uses daily maximum 1-hour ozone observations for a three-year period (the summary year and the two prior years); however, if three years of data are not available, an EPDC can be calculated using only one or two years of data. The EPDC is computed using a statistical procedure that fits an exponential-tail model to the upper tail of the distribution of concentrations. The fitted distribution then is used to analytically determine the concentration that is expected to recur once per year, on average.

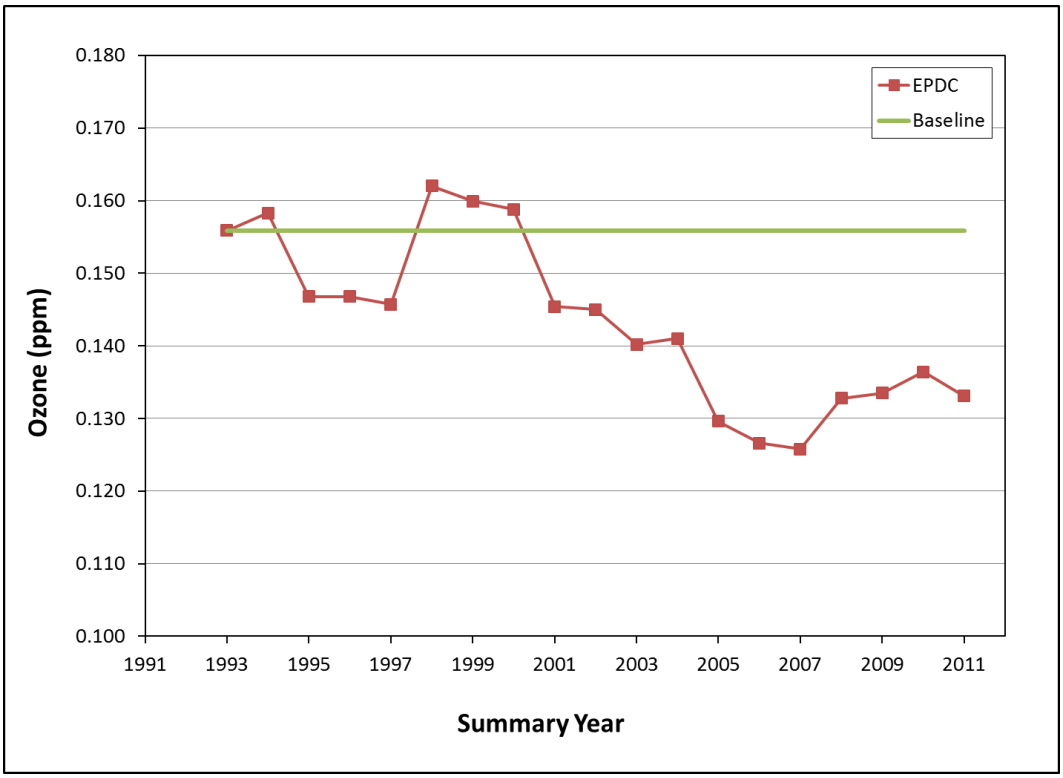
An EPDC labeled as *valid* reflects data that are both complete and representative. An EPDC labeled as *invalid* reflects data that are not complete and therefore, the calculated EPDC may be unrepresentative. While an invalid EPDC can provide useful

[6] California Air Resources Board (1993, August). *Guidance for Annual and Triennial Progress Reports under the California Clean Air Act.* Sacramento, CA.
[7] California Air Resources Board (2003, December), *2003 Triennial Assessment and Plan Revisions.* Included as an e-mail sent to air districts as staff recommendations for preparing CCAA triennial assessments and plan revisions.

information for evaluating long-term air quality trends at individual sites, it cannot be used for determining attainment status. For this progress report, *invalid* EPDC values were not used in the graphic representations of air quality trends; hence, EPDC trends (Figures I-1 through I-4) depicted for some sites are truncated relative to the time period of 1990 through 2011 (at the time of preparation, data for 2012 was not finalized and is not included in these analyses).

Figures I-3 through I-6 show EPDC trends for select sites in the Valley. Per ARB guidance[8] the selected sites include data from the two monitor sites with the highest EPDC values at the end of the reporting period, as well as other sites that have EPDC values within 10% of the highest value in 2011. Only sites with continued valid EPDC values from at least 1996 through 2011 are shown.

Figure I-1 EPDC at the Clovis-N. Villa Avenue Monitor



[8] California Air Resources Board (1993, July 8). *Guidance for using Air Quality-Related indicators in Reporting Progress in Attaining the State Ambient Air Quality Standards,* pp.22–23.

Figure I-2 EPDC at the Fresno-1st Street Monitor

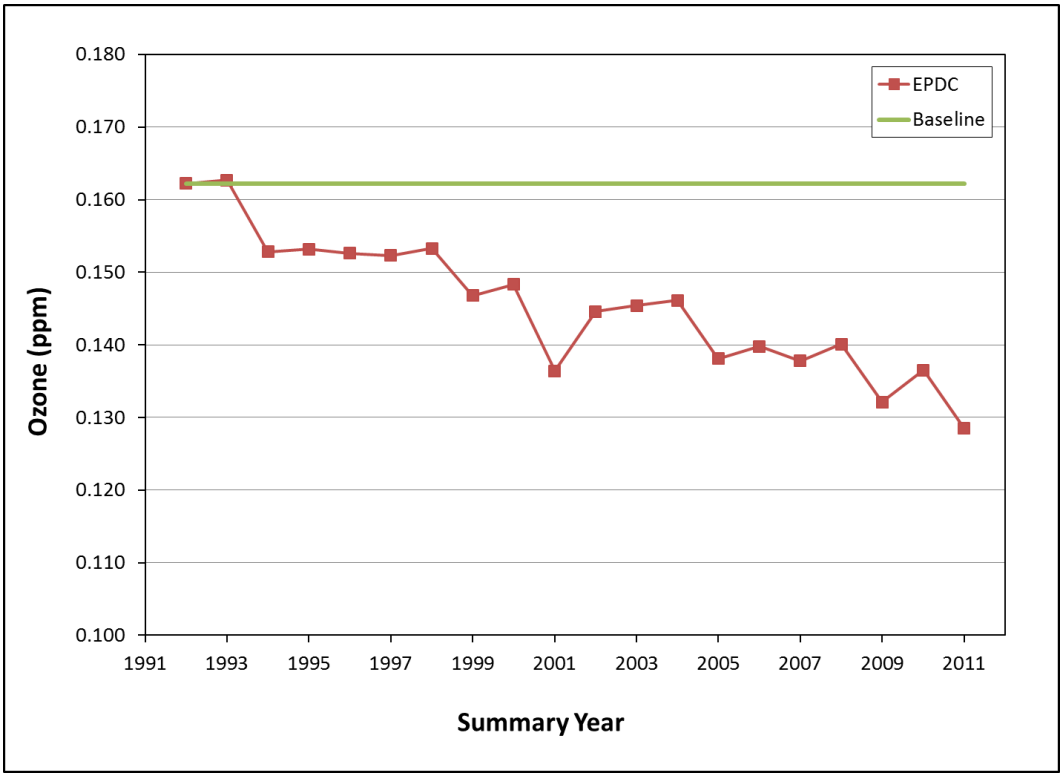


Figure I-3 EPDC at the Fresno-Sierra Skypark Monitor

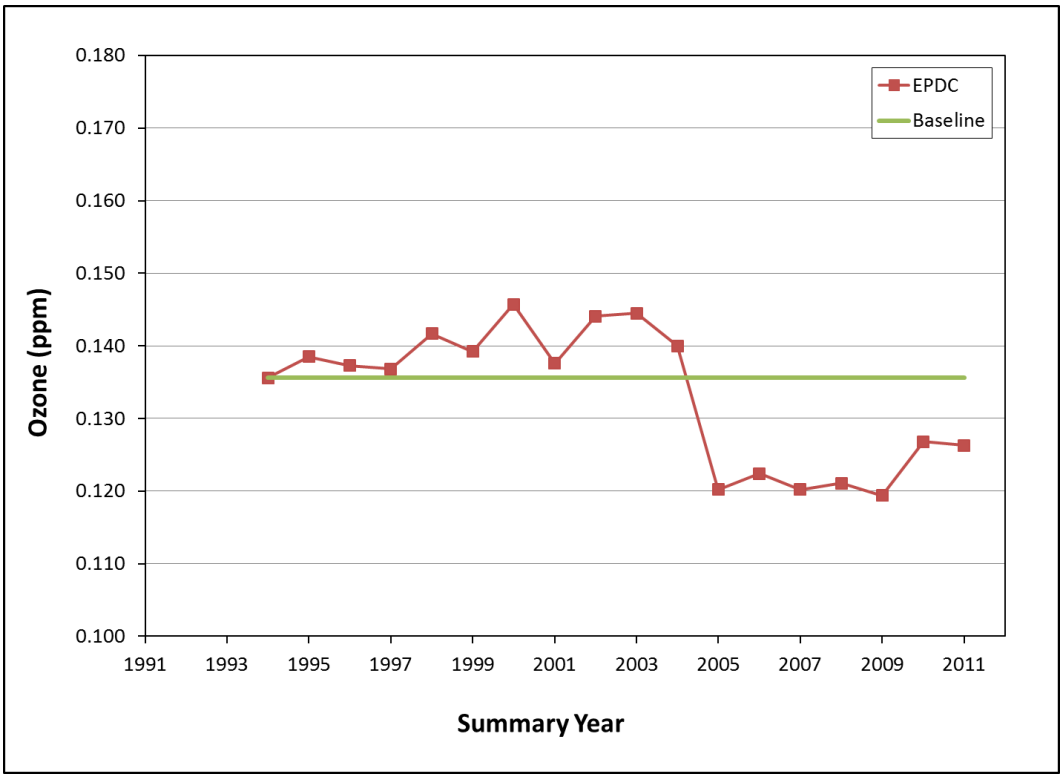


Figure I-4 EPDC at the Edison Monitor

I.2.2 Exposure Indicators

Exposure indicators identify the potential for chronic adverse health impacts, either by population, **population-weighted exposure (PWE)**, or by area, **area-weighted exposure (AWE)**. Unlike the EPDC, which tracks progress at individual locations, the PWE and AWE indicators consolidate hourly ozone measurements from all sites within the district into a single exposure value. The resulting value represents the average potential exposure within the Valley. The term *potential* is used because daily activity affects an individual's exposure. For example, being indoors during the hours of peak ozone concentration will decrease a person's exposure to outdoor concentrations.

The PWE exposure indicator characterizes the potential average annual outdoor exposure per person to concentrations above the level of the state ozone standard. The PWE exposure indicator represents a composite of exposures at individual locations that have been weighted to equally emphasize the potential exposure for each individual in the Valley. In contrast, the AWE indicator characterizes the potential average annual outdoor exposure per square kilometer. The AWE indicator also represents a composite of exposures at individual locations weighted to equally emphasize the potential exposure in all parts of the Valley.

Both exposure indicators are based solely on ambient (outdoor) ozone data. The calculation method assumes that an exposure occurs when a 1-hour ozone measurement is higher than 0.09 ppm, the level of the state 1-hour ozone standard.

The PWE and AWE consider both the level and the duration of hourly ozone concentration above the state standard. The resulting annual exposure indicator is the sum of all the hourly exposures during the year represents an average per exposed person (PWE indicator) or average per exposed square kilometer (AWE indicator).

I.2.2.1 Exposure Indicator Calculations, Generally

As stated above, the PWE and AWE indicators are calculated as an annual value for each year. Hourly ozone concentration data are used from all available sites in the Valley, regardless of whether the data are complete and representative. Because individual exposure values are interpolated from data for several monitoring sites, having complete data from all sites for all hours is not critical for meaningful results.

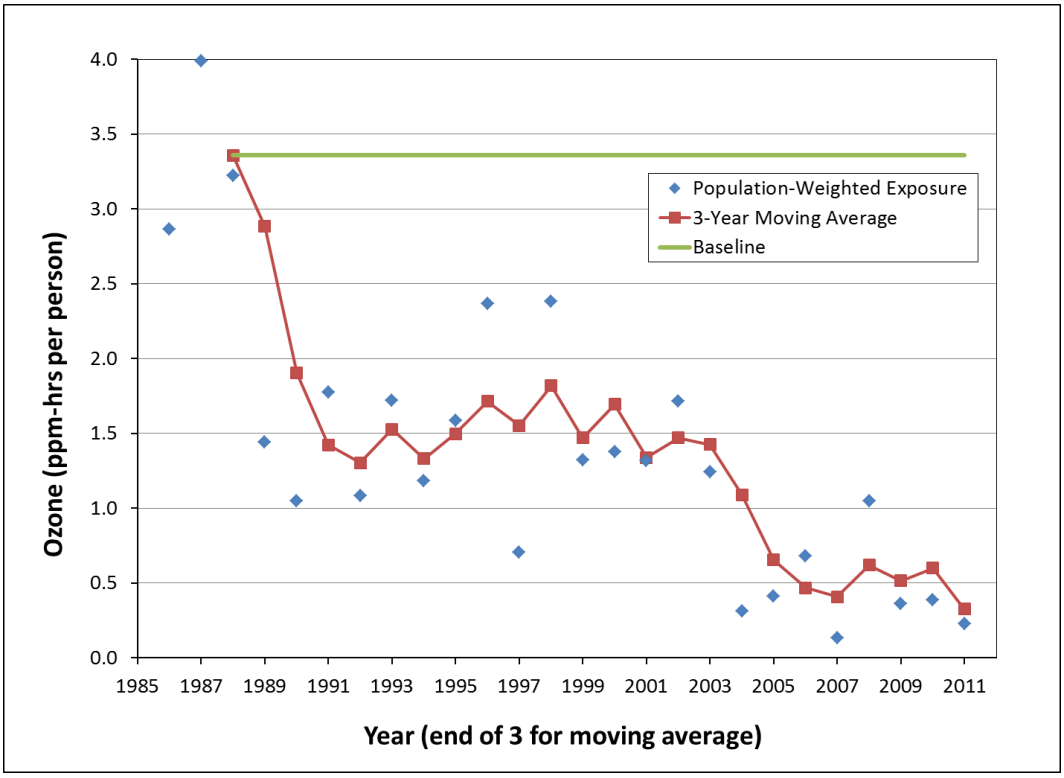
Calculation of the PWE and AWE relies on federal census data. Indicator values for 1999 and earlier reflect 1990 census data, indicator values for 2000 through 2009 reflect 2000 census data, and indicator values for 2010 and 2011 reflect 2010 census data. The federal government divides the nation into census tracts for the purpose of counting population and obtaining demographic information. Each of these census tracts has the following associate data: the centroid of the census tract, the population residing within the census tract, and the land area of the census tract. The population within each census tract is used to compute the PWE and the land area of the census tract is used to compute the AWE. The centroid of the census is used in both calculations.

I.2.2.2 Population-Weighted Exposure Calculation

Hourly ozone concentrations are interpolated to each census tract centroid. Hourly ozone exposures are then calculated for each centroid by subtracting the value of the state 1-hour ozone standard (0.09 ppm) from each interpolated hourly concentration. If negative, the result is set equal to zero and there is no exposure. The hourly exposures are multiplied by the number of people residing in the census tract. These hourly exposures are then added together and divided by the total population of all census tracts for which interpolated exposure values are available. The result represents and hourly PWE for the Valley. The hourly exposures are aggregated into daily PWE. The daily exposures are then aggregated into an annual PWE.

Figure I-5 shows that Valley residents are exposed to decreasing levels of harmful ozone, which is consistent with the previous progress report (2003–2005).

Figure I-5 Valley Population-Weighted Exposure per Person

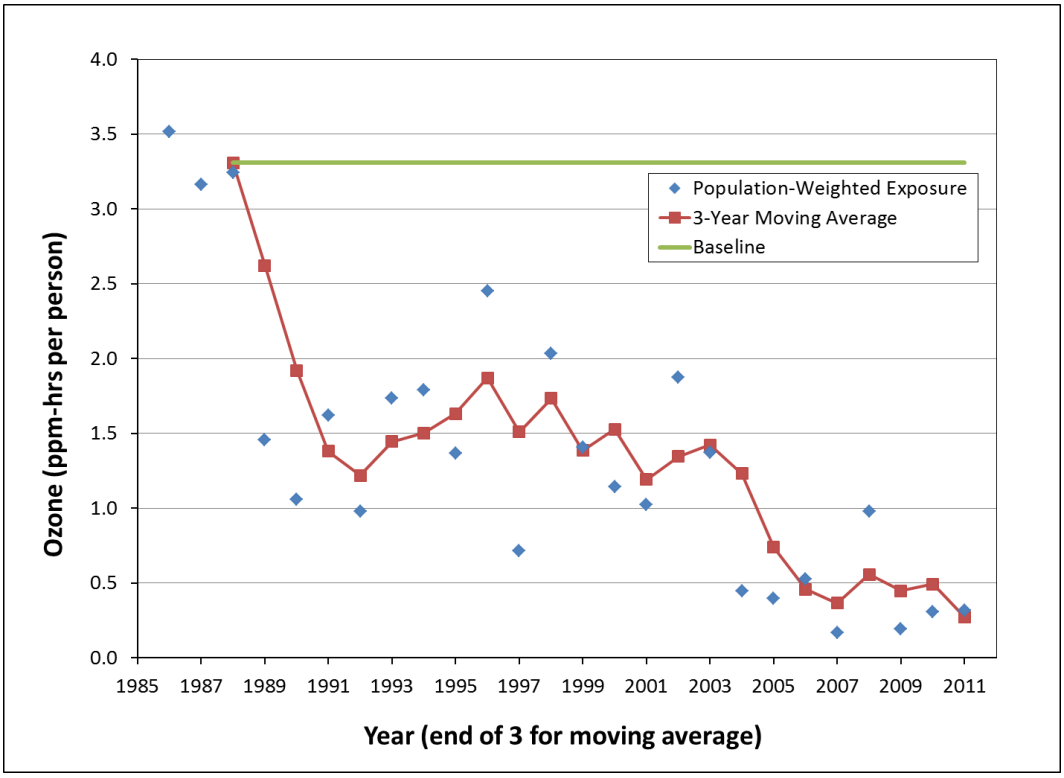


I.2.2.3 Area Weighted Exposure Calculation

The procedure for calculating the AWE is similar to the calculation for the PWE. For the AWE, the hourly exposures for each census tract are multiplied by the square kilometer land area of the census tract. Again, exposures below the level of the state 1-hour ozone standard are set to zero. The hourly exposures are added together and divided by the total land area of all census tracts for which interpolated exposure values are available. The result represents an hourly AWE for the Valley. The hourly exposures are aggregated into a daily AWE. The daily AWEs are then aggregated into an annual AWE, which is done for each year for which data are available.

Figure I-6 shows general improvement in air quality since 1996, with continued improvement in the most recent reporting periods (2006–2011).

Figure I-6 Valley Area-Weighted Exposure per Square Kilometer



I.3 DISTRICT CONTROL MEASURES

The CH&SC[9] and ARB's guidance for triennial progress reports and plan revisions directs districts to report actual emissions reductions achieved for each measure scheduled for adoption in the three-year period addressed by each progress report and plan revision. Table I-1 includes this information for the District for the 2006 through 2011 reporting period.

The CCAA, through ARB, requires upwind transport district, such as the District, to apply best available retrofit control technology (BARCT). Also, to ensure that upwind district minimize their impact on downwind district, ARB requires upwind district to adopt all feasible measures and put no-net-increase thresholds for new source review permitting programs. The District already has such provisions in place in accordance with other CH&SC requirements. The rules shown in Table I-1—as well as all District stationary source rules—meet requirements for BARCT, at a minimum.

[9] CH&SC §40924(b)(2)

Table I-1 Ozone Precursor Emissions Reductions (VOC and NOx) from District Rules (2006–2011)[10,11]

Rule #	Rule Title	Date	Pollutant	Actual Reductions (tpd)
4301	Open Burning	04/15/2010	NOx VOC	7.43 9.64
4307	Boilers, Steam Generators, and Process Heaters 2 to 5 MMBtu/hr	05/19/2011	NOx	1.2
4308	Boilers, Steam Generators, and Process Heaters 0.075 to <2 MMBtu/hr	12/17/2009	NOx	2.77
4306 4320	Boilers, Steam Generators, and Process Heaters >5 MMBtu/hr	10/16/2008	NOx	3.3
4352	Solid Fuel Fired Boilers, Steam Generators, and Process Heaters >5 MMBtu/hr	12/15/2011	NOx	0.0
4354	Glass Melting Furnaces	05/19/2011	NOx	7.47
4565	Biosolids, Animal Manure, and Poultry Litter Operations	03/15/2007	VOC	3.92
4566	Organic Material Composting Operations	08/18/2011	VOC	19.2
4570	Confined Animal Facilities	10/21/2010	VOC	58.2
4601	Architectural Coatings	12/17/2009	VOC	2.7
4603	Surface Coating of Metal Parts and Products, Plastic Parts and Products, and Pleasure Crafts	09/20/2007	VOC	0.0
4604	Can and Coil Coating Operations	09/20/2007	VOC	0.0
4605	Aerospace Assembly and Component Coating Operations	09/20/2007	VOC	0.0
4606	Wood Products and Flat Wood Paneling Products	09/20/2007	VOC	0.0
4607	Graphic Arts and Paper, Film, Foil, and Fabric Coatings	12/18/2008	VOC	0.05
4612	Motor Vehicle and Mobile Equipment Coating Operations	09/20/2007	VOC	0.0
4621	Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plants	12/20/2007	VOC	1.42
4622	Gasoline Transfer into Motor Vehicle Fuel Tanks	12/20/2007	VOC	
4624	Transfer of Organic Liquid	12/20/2007	VOC	
4653	Adhesives and Sealants	09/16/2010	VOC	0.12
4661	Organic Solvents	09/20/2007	VOC	0.91
4662	Organic Solvent Degreasing Operations	09/20/2007	VOC	0.52
4663	Organic Solvent Cleaning, Storage, and Disposal	09/20/2007	VOC	0.21
4682	Polystyrene, Polyethylene, and Polypropylene Products Manufacturing	09/20/2007	VOC	0.4
4684	Polyester Resin Operations	09/20/2007	VOC	0.0
4695	Brandy Aging and Wine Aging Operations	09/17/2009	VOC	0.13
4702	Internal Combustion Engines	08/18/2011	NOx	1.43
4703	Stationary Gas Turbines	09/20/2007	NOx	2.2
4902	Residential Water Heaters	03/19/2009	NOx	0.85
9310	School Bus Fleets	09/21/2006	NOx	0.77
9410	Employer-based Trip Reduction	12/17/2009	NOx VOC	0.6 0.6
9610	State Implementation Plan Credit for Emission Reductions Generated Through Incentive Programs	6/20/2013	NOx	varies

[10] This time period also included reductions of other pollutants (e.g. particulate matter), but are not included here.
[11] Reductions listed for informational purposes only. Data is based on varying years and inventories and should not be used for further computations.

I.4 MOBILE SOURCE CONTROL MEASURES

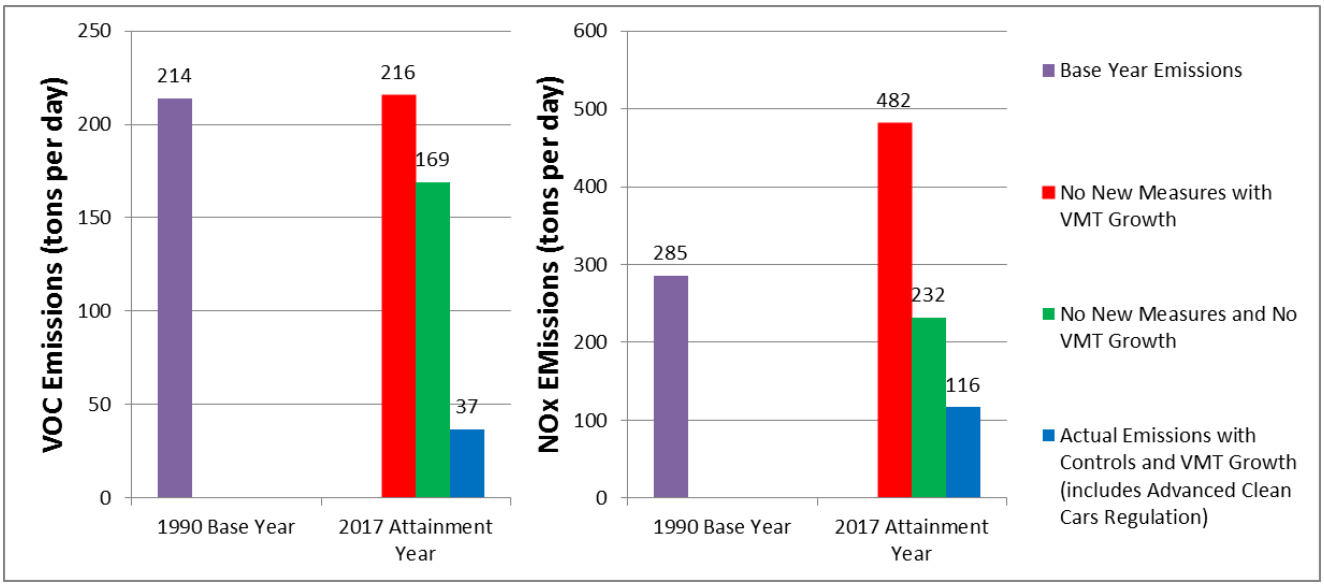
Under the CCAA's severe nonattainment classification for the state ozone standard, the District is required to include reasonably available transportation control measures sufficient to substantially reduce the rate of increase in passenger vehicle trips and miles traveled per trip in its state air quality plans. The District coordinates with the Valley Metropolitan Planning Organizations (MPOs) to ensure that such measures are in place and accounted for in each attainment plan. In addition to transportation control measures, the District effectively uses incentives and land use programs to reduce emissions from mobile sources.

I.4.1 District Transportation Strategies

The District continues to work with MPOs to implement previously committed measures and develop new measures for State Implementation Plan (SIP) submittals. District and MPO staffs are working on specific actions and programs to reduce vehicle miles traveled (VMT) or to reduce emissions through other activities.

Appendix D to the *2013 Plan for the Revoked 1-Hour Ozone Standard* demonstrates that attainment year emissions for both VOC and NOx emissions, accounting for controls and VMT growth (tied to population growth), are less than hypothetical future-year emissions that do not include new controls or VMT growth. Therefore, the identified transportation control strategies and measures are sufficient to offset the growth in emissions attributable to VMT growth. The summary of that analysis is shown graphically in Figure I-7.

Figure I-7 VOC & NOx Emissions using Valley "2013 FTIP" VMT for 1-Hour Ozone Planning



I.4.2 District Incentive Programs

The District continued to implement successful voluntary mobile source emissions reductions programs in the 2006–2011 reporting period, including incentive programs for on-road heavy-duty trucks, agricultural equipment, school buses, and public and private vehicles.

The District administers several incentive programs that target on-road heavy-duty trucks, which are one of the biggest sources of NOx emissions in the Valley. Through the Proposition 1B Goods Movement Emission Reduction Program, the Carl Moyer Voucher Incentive Program (VIP) and other District-operated voucher incentive programs the District has replaced hundreds of older, high-polluting trucks with cleaner trucks certified to meet the latest ARB emissions standards.

Off-road agricultural equipment replacements and repowers play a crucial role in reducing emissions. These equipment units, including tractors, backhoes, wheel loaders, and other off-road farming vehicles are widely used in the Valley, and are essentially uncontrolled and unregulated. Eligible projects are funded with local, state, and federal sources, including but not limited to ISR, Carl Moyer funding, AB923 funding, federal designated funding, and federal Diesel Air-Shed Grant funding. The District has funded the repower or replacement of over 1,017 off-road agricultural vehicles, with more projects in the queue.

The District's School Bus Replacement and Retrofit programs provide grant funding for new, safer school buses and air pollution control equipment for existing buses. California public school districts that own their own buses are eligible to receive funding using local, state, and federal funds, including the Lower-Emission School Bus Program (Proposition 1B), DERA funding, and the American Reinvestment and Recovery Act. The District has provided funding to retrofit 1,879 school buses and replace 432 school buses.

The District also provides incentive programs that allow the general public the opportunity to contribute to the Valley's clean air goals. The Polluting Automobile Scrap and Salvage (PASS) program offers a cash incentive for participants to retire or repair their older vehicle. This program has replaced 202 high-emitting vehicles, retired 504 additional vehicle through a cash incentive, screened nearly 5,000 vehicles for high emissions, and provided nearly 3,000 vouchers for emissions-related repairs. The Drive Clean! Rebate Program provides incentives to Valley residents who want to purchase an electric or other alternative-fuel vehicle. The REduce MOtor Vehicle Emissions (REMOVE) program provides incentives for specific projects to reduce vehicle emissions including e-mobility, bicycle infrastructure, alternative-fuel-vehicle mechanic training, and public transportation and commuter vanpool subsides. The latest addition to the District's community incentives program is the Public Benefit Grants Program. This program provides funding to Valley cities, counties, and other public agencies for a variety of clean-air, public-benefit programs.

I.4.3 District Land Use Programs

In addition to transportation strategies and innovative incentive programs that achieve emissions reductions, the District gains further emissions reductions through its land use programs.

The District reviews city, county, and other agency California Environmental Quality Act (CEQA) and development proposals. During review, the District evaluates potential sources of emissions, including traffic-generating sources. The District developed two resource documents to help other agencies evaluate potential air quality impacts. The *Air Quality Guidelines for General Plan* document, which was revised in 2005, encourages cities and counties to include air quality elements or air quality goals and policies in their general plans to reduce mobile- and area-source emissions and help attain state and federal air quality standards. The *Guide for Assessing and Mitigating Air Quality Impacts* is an advisory document that provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents.

In addition to providing guidance to local and regional agencies, the District developed a first-of-its-kind rule to reduce projected emissions from new development in the Valley. The Indirect Source Rule (ISR), adopted by the District Governing Board in December 2005, requires proponents of new development to reduce NOx and PM emissions to mitigate a portion of the expected emissions with onsite mitigation or by contributing to a mitigation fund, which would be used to pay for cost-effective emissions reductions off site. As reported in the 2011-2012 ISR annual report, ISR achieved 898.8 tons of projected NOx emission reductions for ISR projects approved between July 1, 2011 and June 30, 2012.[12]

I.5 POLLUTANT TRANSPORT MITIGATION

Primary and secondary pollutants are transported across jurisdictional boundaries through normal atmospheric processes. Under the CCAA, ARB, in cooperation with local air districts, is required to evaluate intrastate transport and suggest mitigation for such transport.

ARB issued an assessment of ozone transport in California in April 2001 and concluded that transport from the San Francisco Bay Area Air Basin and the broader Sacramento area contributes to some exceedances of the state 1-hour ozone standard in the Valley. The degree of contribution ranges from overwhelming to inconsequential, depending on weather conditions and time of year. ARB also found that the Valley contributes overwhelmingly to ozone exceedances in the Mojave Desert, Mountain Counties, and Great Basin Valley air basins; significantly to the North Central Coast; and significantly to inconsequentially to the broader Sacramento area and South Central Coast.

[12] San Joaquin Valley APCD. *2012 Annual Report: Indirect Source Review Program,* p. 7. Available at http://www.valleyair.org/ISR/Documents/ISRAnnualReport2011-2012.pdf.

ARB, as required by the CCAA, established mitigation requirements in 1990, which are contained in title 17, California Code of Regulations, sections 70600 and 70601. These regulations were amended in 1993 and 2003, the latest of which became effective on January 3, 2004. The 2003 amendments added two new requirements for upwind districts, requiring them to consult with their downwind neighbors and adopt "all feasible measures" for ozone precursors and amend their "no net increase" thresholds for permitting sot that they are equivalent to those of their downwind neighbors no later than December 31, 2004.

As demonstrated in the past, the District is committed to reviewing feasible measures adopted across California to obtain future emissions reductions. ARB in conjunction with the California Air Pollution Control Officer Association (CAPCOA) has published documents that include feasible control measures for certain sources addressing pollutants of concern. The District continually reviews these documents, as well as state and federal clearing houses, to determine if additional control measures are achievable. Decisions regarding all feasible measures are based on meeting any shortfall identified in rule commitments, the economic impact of measures recommended, and the District's progress toward meeting attainment goals.

The District has taken a proactive role in characterizing transport of pollutants within the Valley and across District boundaries through strong support of and participation in the Central California Ozone Study (CCOS). ARB and the District continue to analyze data from the Central California Ozone Study (CCOS) to better understand transport and to develop improved techniques for quantifying mitigation needs.

The District is also coordinating with other agencies (National Oceanic and Atmospheric Administration and University of California at Davis) to investigate and document trans-boundary ozone flow from Asia. The District awarded UC Davis $130,000 for the installation of a trans-boundary ozone and PM2.5 monitoring station on Chews Ridge, east of Big Sur, California. Data from this research will contribute to the overall understanding and mitigation needs throughout California.

I.6 PLAN REVISION

The CCAA requires the District to establish a strategy that will achieve an annual average 5% reduction in ozone precursor emissions, or alternatively, to commit to taking all feasible measures to reduce emissions within its boundaries as expeditiously as possible. The District's adopted strategy is based on the latter alternative. In fact, in December 2010, ARB determined that, based on the District's SIP and the evaluation of control feasibility in all rulemaking actions, the District has undertaken *all feasible measures* to reduce nonattainment air pollutants from sources within the District's jurisdiction and regulatory control.[13]

During the 2006–2011 reporting period, the District continued to implement its original control strategy of adopting rules to fulfill the District's SIP commitments and then to

[13] ARB Executive Order G-10-126. (2010, December 10), required under California Health and Safety Code §40612.

address additional measures needed for attainment of the federal and state ozone standards. The District met all its federally required emission reduction rates (3% per year) for 8-hour ozone precursors for the 2006–2011 reporting period addressed in this progress report.

In future reporting periods, the District will continue its efforts to improve its emissions inventory with in-house efforts, joint efforts with ARB, and with outside contractors when evaluating specific sources. The District continues to participate with ARB and other districts in the evaluation of CCOS data and development of modeling tools to improve ozone standard attainment planning.

I.6.1 Control Strategy

The District's strategy for reducing ozone pollution to attain the state ozone standard and the revoked 1979 1-hour ozone standard includes adopted strategies from previous District plans (*2007 Ozone Plan, 2008 PM2.5 Plan, 2012 PM2.5 Plan*) and strategies implemented by ARB. The District's multi-faceted strategy uses a combination of conventional and innovative control strategies. This comprehensive strategy includes regulatory actions; incentive programs; technology advancement programs; policy and legislative activities; public outreach, participation, and communication; and other innovative strategies.

The District's thorough evaluation of potential control measure emissions reductions for the *2012 PM2.5 Plan* resulted in several commitments for future regulatory actions. The measures identified in Table I-2 reduce ozone precursors, so were also included in the *2013 Plan for the Revoked 1-Hour Ozone Standard*.

Table I-2 Regulatory Control Measure Commitments

Rule		Amendment Date	Compliance Date	Emissions Reductions*
4308	Boilers, Steam Generators, and Process Heaters 0.075 to <2 MMBtu/hr	2013	2015	TBD
4905	Natural Gas-Fired, Fan-Type Residential Central Furnaces	2014	2015	TBD
* Based on full implementation and best available information as of this plan. A more thorough evaluation of control techniques and feasibility will be conducted at the time of rule development.				

Similarly, the District's review of potential control measure opportunities that required additional information and study regarding current emissions inventories, the effectiveness of current controls, and future technologies. The District identified these commitments as *further study measures* in the *2012 PM2.5 Plan,* and continued that commitment of applicable measures in the *2013 Plan for the Revoked 1-Hour Ozone Standard* (Table I-3).

Table I-3 Further Study Measures

Control Measure		Description	Completion Date
Rule 4103*	Open Burning	Evaluate the feasibility of postponed burning activities every 5 years, as outlined in the current rule.	2015
Rule 4106*	Prescribed Burning	Examine the feasibility of implementing a biomass removal program similar to one in Placer County.	2013
Rule 4311*	Flares	Review of flare minimization plans and annual reports for further emission reduction opportunities.	2013
Rule 4601	Architectural Coatings	Further evaluate potential opportunities for future emission reductions as adopted in the SCAQMD rule during the development of the next ozone plan.	2014
Rule 4623	Storage of Organic Liquids	Evaluate the potential of lowering the leak detection limit to be consistent with the NSPS and SCAQMD Rule 463 (amended November 2011) limits during the development of the next ozone plan.	2014
Rule 4624	Transfer of Organic Liquids	Evaluate the opportunity to lower the VOC limit in the rule to match the BAAQMD Regulation 8 Rule 33 limit of 0.04 lb VOC/1,000 gallons.	2014
Rule 4693	Bakery Ovens	Evaluate the feasibility and potential for emission reductions from implementing a 30 ppmv @3% O_2 NOx emission limit.	2014
Lawn Care Equipment*		Evaluate emissions inventory and technology demonstration efforts to identify potential emission reduction opportunities.	2013
Asphalt & Concrete Operations*		Examine feasibility of warm-mix asphalt as a potential emission reduction opportunity.	2013
Ongoing Study & Research		Conduct and support ongoing research that continues to enhance the District's understanding of ozone concentrations and formation, including further health research.	Ongoing
* Also included in *2012 PM2.5 Plan*			

I.6.2 Cost-Effectiveness Ranking

The CCAA requires that each plan revision includes an assessment of the cost-effectiveness of available and proposed control measures. Table I-4 provides a list of stationary source control measures for ozone precursors ranked by cost-effectiveness. In developing an adoption and implementation schedule for a specific control measure, the District considers the relative cost-effectiveness of the measure as well as other factors including, but not limited to, technological feasibility, total emission reduction potential, the rate of reduction, public acceptability, and enforceability, per CH&SC §40922.

Table I-4 Control Measure Cost-Effectiveness Rankings

Rule Number	Rule Name	Amendment Date	Compliance Date	Reduction Start	Cost Effectiveness Ranking
4308†	Boilers, Steam Generators, and Process Heaters 0.075 to <2 MMBtu/hr	2013	2015	2015	Low
4905†	Natural Gas-Fired, Fan-Type Residential Central Furnaces	2014	2015	2015	Low

Cost-Effectiveness Key:
High: Require capital investment to purchase & Install controls. May also be reflective the lack of surplus reductions available
Medium: Control measure requires capital investment, but measure has potential for significant emission reductions
Low: Control measure is a management practice or low cost control option

I.6.3 Emissions Trends

The emissions inventory is an estimate of ozone precursor pollutants (ROG and NOx) emitted into the air by sources. Emissions inventory trends can be used to assess progress a region is making toward attaining the California ambient ozone standard—reducing precursor emissions lowers ambient ozone levels.

The emissions inventory represents estimates of actual emissions calculated using reported or estimated process rates and emission factors. To derive future-year emissions inventories, emissions from a base year are projected forward in time based on expected growth rates of population, travel, employment, industrial and commercial activity, energy use, as well as reductions from control measures in effect. Appendix B of the *2013 Plan for the Revoked 1-Hour Ozone Standard* details the emissions inventory for each source category within each primary source sector. Tables I-5 and I-6 summarize the primary source sector totals for 5-year increments beginning in 2000 for ROG and NOx.

Table I-5 ROG Emissions Trend (average summer tons per day)

Source Category	2000		2005		2010		2015		2020	
	tpd	%	tpd	%	tpd	%	tpd	%	tpd	%
Stationary Sources	114.0	22	102.1	22	100.1	23	98.01	27	100.7	28
Area-Wide Sources	220.0	43	223.3	48	220.2	51	188.0	51	196.8	54
On-Road Motor Vehicles	105.4	21	76.8	16	62.4	14	37.2	10	29.0	8
Other Mobile Sources	70.6	14	67.0	14	52.8	12	42.8	12	38.3	10
Total	**510.0**	100	**469.2**	100	**435.5**	100	**366.0**	100	**364.8**	100

Table I-6 NOx Emissions Trend (average summer tons per day)

Source Category	2000		2005		2010		2015		2020	
	tpd	%	tpd	%	tpd	%	tpd	%	tpd	%
Stationary Sources	84.0	15	66.3	13	46.4	13	32.4	13	29.1	15
Area-Wide Sources	11.8	2	12.8	2	11.0	3	11.0	4	11.0	5
On-Road Motor Vehicles	305.6	55	293.5	57	194.0	55	130.6	50	87.9	45
Other Mobile Sources	156.6	28	143.4	28	101.8	29	84.0	33	68.6	35
Total	**558.0**	100	**516.0**	100	**353.2**	100	**258.0**	100	**196.6**	100

I.6.4 Meeting State Requirements for Plan Revisions

The *2013 Plan for the Revoked 1-Hour Ozone Standard*, including appendices, meets the requirements of CCAA §40925 for plan revisions required to show continued progress in attainment of state 1-hour ambient standard for ozone. Table I-7 identifies each of the CCAA requirements and the chapter or appendix in which the information or analyses are located.

Table I-7 CCAA §40925 Requirements for Triennial Plan Revisions

Mandate for Severe Areas	Source of Requirement (CH&SC Sections)	Submittal in *2013 Plan for the Revoked 1-Hour Ozone Standard*
Emissions Inventory	40913(a)(4-5)	Appendix B
Air Quality Analysis, including population exposure	40913(a)(1-2)	Chapter 2, Appendix A, and Appendix I
Control Measures, including Reasonably Available Control Technology (RACT), Best Available Retrofit Control Technology (BARCT), area and indirect source controls	40913(a)(6-7), 40920(a)(1), 40918(3-4)	Chapters 3 and 4, Appendix C Appendix I
Emission Reductions/All Feasible Measures	40913(a)(6-7), 40914(b)(2)	Chapters 3 and 4 Appendix C Appendix I
Cost-Effectiveness, including a list which ranks the control measures from least to most cost-effective	40922(a-b)	Appendix I
Reasonably available transportation control measures, reducing passenger vehicle trips and miles traveled	40918(3)	Appendix D
Transport	40912 40913(a)(3)	Chapter 2 and Appendix I
Contingency Measures	40915	Chapter 4
Public Education	40918(6)	Chapter 3