Appendix I

Candidate Control Measures

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Appendix I: Candidate Control Measures

The San Joaquin Valley Unified Air Pollution Control District (District) conducted an exhaustive search for emissions reductions to use in meeting federal Clean Air Act requirements for this *2007 Ozone Plan*. Chapter 6 details the process that the District used to develop measures for reducing emissions of ozone precursors (also called control measures). This Appendix presents all of the candidate control measure ideas developed for this plan, which are referred to in Chapters 6, 7, and 8 and for some source categories, under ARB and EPA's jurisdiction, Chapter 9 of this plan. As such, it should be considered as a master list of all candidate control measures identified and evaluated by District staff for this plan.

Once District staff assembled Appendix I, they then screened the measures to identify high priority measures to be implemented in the years immediately following plan adoption, those measures that might be implemented in future years given favorable trends in technology development, and those measures that require further study to identify when they could be implemented and what reductions they could achieve. Chapter 6 compiles those measures to be implemented in the years immediately following plan adoption, and also gives a schedule for when the measures would be adopted and implemented, and an estimate of the emissions reductions. Consequently, Chapter 6 contains fewer measures than Appendix I, because it presents a subset of the master list of measures.

Each candidate control measure description in Appendix I has the following major components: Title and Number, Source Category Affected, Current Control, Future Control Options, Future Incentive Options, Discussion, Recommendations, and Projected Reductions. Not all of these components are relevant for all measures listed in Appendix I. For example, a further study measure will not have emissions reductions identified, since one of the reasons a measure is placed into the "further study" category is to determine potential emissions reductions.

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Open Burning (S-AGR-1)

(Managed Burning and Disposal)

Source Category:
This category includes the burning any material, including agricultural waste.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	4.8	4.8	4.7	4.7	4.7	4.6	4.6	4.5
VOC	5.7	5.7	5.6	5.6	5.6	5.5	5.5	5.4

- The emission inventory needs to be further refined to ensure that it fully captures the reductions achieved by existing Rule 4103.
- EICs Affected: 670-660-0262, 670-662-0262

Current Control: District Rule 4103 has limitations on the amount of material that can be burned and the types of material that can be burned, and restricts when burning can occur. The rule provides exemptions for fires that serve a ceremonial purpose, and for when the District determines there would be an imminent and substantial economic loss if burning were to be prohibited. This rule reduces both VOC and NOx emissions from between 58% to almost 100%, depending on the type of material.

Future Control Options:

- District staff is committed to working with agricultural industry stakeholders to identify feasible alternatives to burning agricultural waste.

Discussion:

- Burning is located at stationary sources for which the District has legal authority to regulate air emissions.
- On September 22, 2003, Governor Gray Davis signed California State Senate Bill 705 (SB 705). This action amended the California Health and Safety Code (CH&SC) Sections 41855.5 and 41855.6 to require the District to revise rules that regulate emissions from open burning of waste produced by agricultural operations. The bill divided the agricultural wastes as follows:
  - Phase I: Diseased Crops (June 1, 2005)
  - Phase II: Field Crops, Prunings, and Weed Abatement (June 1, 2005); and Best Management Practices for Weed Abatement (June 1, 2006)
  - Phase III: Orchard Removals (June 1, 2007)
  - Phase IV: Other Materials, Vineyard Removals, and Prunings from Surface-Harvested Crops (June 1, 2010)

Open Burning
(Continued)

- The District's Governing Board adopted rule amendments to District Rule 4103 for Phase I and Phase II in 2004 and 2005, respectively. The current rulemaking project will focus on the provisions in Phase III - the prohibition on the burning of orchard removals. The burning of rice straw, which was preliminarily addressed in Phase II, will also be considered in Phase III. A later rulemaking process for Phase IV will address the prohibition of burning of vineyard removals, surface harvested prunings and other materials.
- The District may postpone the burn prohibition commencement dates set forth in the CH&SC but cannot provide a permanent allowance for burning. Each of the following criteria must apply for the District to postpone the burn prohibition commencement dates:
  - The District determines that there is no economically feasible alternative of eliminating the waste.
  - The District determines that there is no long-term federal or state commitment for the continued operation of biomass facilities in the San Joaquin Valley or the development of alternatives to burning.
  - The District determines that the continued issuance of permits for that specific category or crop will not cause, or substantially contribute to a violation of an applicable federal ambient air quality standard.
  - The California Air Resources Board concurs with the District's determinations.

Recommendation:

- District staff recommends that the District continue to meet its legal obligation under the CH&SC (SB 705) through its rulemaking projects addressing the burning of agricultural waste.
- Currently this source category is not a candidate for incentive funding, but further analysis and study is necessary to determine if this source category may garner cost effective reductions in the future provided funding sources are available. Please see Chapter 7 for any additional information.

Projected Reductions:

Provided the technical and economic limitations of the alternatives to open burning, District staff anticipates that the recommended controls will yield the emissions reductions listed below.

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	1.1	2.4	2.4	2.4	3.5	3.5	3.4
VOC	1.3	2.8	2.8	2.8	2.8	2.8	2.7

Confined Animal Facilities (S-AGR-2)

(Dairy Operations)

Source Category:
This source category includes facilities and operations that raise fowl or animals that are corralled, penned, or otherwise caused to remain in restricted areas for commercial purposes and feeding is by means other than grazing.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC without 4570	65.4	68.7	72.5	74.0	76.9	81.4	85.9	90.4
VOC *adjusted	65	68	53	55	57	60	64	67

***Baseline adjusted to reflect recently adopted Rule 4570 reductions & current estimated control efficiencies.

- EIC Affected: 620-618-0262

The following are current efforts being considered for refining the emissions inventory for this source category:

- Research is being conducted to refine the emission factors;
- Analysis is being conducted to include emission sources, such as feed, that were not included in the inventory;
- Analysis of the impact of current BACT and Rule 4570 requirements, which may result in refining growth factors; and
- Research into the control efficiencies for the mitigation measures in Rule 4570, which may result in refining control efficiencies.

Current Control:

- District Rule 4570 requires dairy owners/operators to implement 19 VOC mitigation measures from a list of 69 measures, which is expected to achieve an overall VOC reduction of 26% from this source category.
- Dairies with less than 1,000 milk-producing cows are exempt from the rule requirements.
- The compliance date for the requirements in the current rule is December 2008.

Future Control Options:

- Increasing the required management practices listed in the rule by two (2) would result in an additional 20% facility-wide reductions at affected sources for an additional overall source category VOC reduction of 6% from this option. The exact increase in required management practices will be determined during the rule development process after considering socioeconomic, environmental, and regulation issues.

Confined Animal Facilities
(Continued)

- Dietary changes to high moisture feed or steam flaked corn instead of rolled corn; setting a maximum percent of the animal's diet that can contain silage; or enclosing silage in bags may reduce VOC emissions from feed by an overall source category VOC reduction of 10% from this option. The feasibility of this amendment will be determined during the rule development process.
- Lowering the applicability threshold for dairies and requiring management practices for these newly affected facilities may achieve an additional 9% reduction in VOCs from this source category. The feasibility of this amendment will be determined during the rule development process.
- Research is currently being done by California State University Fresno, US EPA, and ARB that may identify new additional control options or technology.

Discussion:

- This source is within the District's legal authority to regulate per to CH&SC 40724.
- Lowering the applicability level, incorporating requirements for additional mitigations measures and considering requirements for dietary changes all have a potential to achieve an overall 25% VOC reduction from this source category.
- Based on current District experience and that of other districts, it is expected that the rule project will take approximately 16 months to go from scoping meeting to public hearing.

Recommendation:

- Lower the applicability threshold to bring more sources into the rule, increase the number of mitigation measure from 19 to 21 and implement dietary feed requirements may be likely control options for future controls. Although the exact number and type of additional practices and the exact threshold will be determined during the rule development process after considering socioeconomic, environmental, and regulation issues.

Projected Reduction:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	6.8	6.7	18.9	20.4	21.5	22.9

Orchard Heaters (S-AGR-3)

(Unclassified)

Source Category:
This source category covers orchard heaters commonly known as “smudge pots”. Other types of orchard heaters, such as wind machines, are not included in this category.

Emissions Inventory:
With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004

Current Control: District Rule 4303, last amended December 16, 1993, requires that orchard heaters produce less than 1 gm/min. of solid carbonaceous material.

Control Options:
- None; only minor rewording for administrative changes.

Discussion:
- Use of orchard heaters has been decreasing over past years to the point that they are no longer used in many San Joaquin Valley counties.
- These units are not in use during the ozone season.
- Since emissions from this source occur during the cold season, it is not relevant to the control of ozone, which is a summer problem.

Recommendation:
- This control measure should be considered in a future PM2.5 plan development strategy but not recommended as an ozone control measure since these units are operated outside of the ozone season and do not contribute to summertime ozone.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Pesticides/Fertilizers (S-AGR-4)

(Post-Harvest Fumigation)

Source Category:
This source category includes fumigation operations used to control pests in post harvest products, such as fruits, vegetables, cotton, and grains.

Emissions Inventory:
With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

- EIC Affected: 530-540-3225-0000

Current Control: There is no current rule-based requirement for controlling VOCs from post-harvest fumigation operations. Post harvest fumigation using methyl bromide is a District-permitted activity.

Future Control Options:
- Capture and control with 85% overall efficiency, using adsorption systems.

Discussion:
- As a pesticide, methyl bromide is mainly used in the fumigation of agricultural fields, which is under the jurisdiction of the Department of Pesticide Regulation. Fumigation of post-harvest products occurs in stationary facilities, which is subject to District authority.
- The inventory, above, represents the portion that is used for fumigation of post harvest products, which approximately is 5% of the total methyl bromide inventory (e.g. 2.26 tons per day in the 2005 summer season).
- There are 210 permitted fumigant operations, and of these, there are 69 permitted operations using methyl bromide as fumigant.
- A source in Monterey County has successfully installed a capture and control system with 85% overall efficiency, using adsorption as the control technique.
- It is estimated that 50% of the District-permitted sources have enough throughput to take advantage of the abovementioned technology.
- The emission reduction is based on controlling emissions from 50% of the facilities using methyl bromide for fumigation, which have enough throughput to take advantage of the adsorption technology. Facilities that don't have enough throughputs may be subject to alternative compliance options, whereby equivalent VOC reductions are made elsewhere, in lieu of controlling VOCs from methyl bromide fumigation.

Post-Harvest Fumigation
(Continued)

Recommendation:

- Based on the current emissions inventory or lack thereof, control level, and existing technology, emission reductions are not quantifiable for this source category. However a future study to re-evaluate this source category is planned.

Projected Reductions:

With recommended controls

Emissions Reduction, Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Boilers, Steam Generators, and Process Heaters, >5 MMBtu/hr (S-COM-1)

(Electrical Utilities, Cogeneration, Oil & Gas Production – Combustion, Petroleum Refining – Combustion, Manufacturing & Industrial, Food & Ag Processing, Service & Commercial)

Source Category:

This source category includes a wide range of industries including but not limited to those listed above.

Emissions Inventory:

With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	7.5	4.7	4.6	4.6	4.7	4.7	5.2	5.4
VOC	0.7	0.7	0.7	0.71	0.71	0.73	0.75	0.77

- EICs Affected: 010-005-0110; 010-005-1220; 030-005-0110; 030-005-0124; 030-005-0130; 030-005-1220; 030-005-1530; 030-010-0110; 030-010-1600; 030-015-0110; 030-015-0130; 040-005-0110; 040-005-0130; 040-010-0100; 040-010-0110; 040-010-1000; 050-005-0110; 050-005-0122; 050-005-0124; 050-005-0300; 050-005-1220; 050-010-1220; 050-010-1224; 052-005-0110; 052-005-0122; 052-005-0124; 052-005-1220; 052-005-1510; 052-005-1520; 052-010-0110; 052-010-0120; 052-010-1224; 060-005-0110; 060-005-0122; 060-005-0124; 060-005-0144; 060-005-0320; 060-005-1220; 060-005-1520; 060-010-1220

Current Control:

- Rule 4306 is currently the most stringent in the state and requires the most effective controls.
- Rule 4306 sets NOx limits of 9 ppmv for units greater than 20 MMBtu/hr and 15 ppmv for units less than 20 MMBtu/hr. For large refinery units >110 MMBtu/hr the limit is 6 ppmv. The limits become effective in 2007.
- The rule has an optional enhanced NOx limit of 6 ppmv for units greater than 20 MMBtu/hr, which becomes effective in 2008.
- Low-use units with an annual heat input of 9 billion Btu or less need not comply with the limits but needs periodic tune-up or limit exhaust oxygen to 3% or less.
- The current limits in Rule 4306 achieve 45% reduction from previously controlled emissions limit of 30 ppmv required by previous Rule 4305.

Future Control Options:

- Lower NOx limits are achievable by using selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR). Both technologies reduce NOx by injecting ammonia to the exhaust gas to convert NOx to elemental nitrogen and oxygen.
- Ultra Low NOx burner technology at this time is technologically capable of achieving 9 ppmv NOx.

Boilers, Steam Generators, and Process Heaters, >5 MMBtu/hr
(Continued)

- Low temperature oxidation may be technologically feasible but its application on boilers has not yet been achieved in practice or established as BACT for this source category.

Discussion:

- The units in this source category are located at stationary sources for which the District has legal authority to regulate air emissions.
- Lowering the current limit 9 ppmv to 6 ppmv for units greater than 20 MMBtu/hr could be achieved by retrofitting existing units with SCR or SNCR. Ultra Low NOx burner alone is not technologically capable of such low limit.
- An estimated 40% reduction from current emissions level could be achieved by lowering the NOx emission limit to 6 ppmv for units greater than 20 MMBtu/hr by using SCR or SNCR.
- To date, the District has processed permit applications for nine units from operators who decided to comply with current Rule 4306 enhanced option NOx limit of 6 ppmv by 2008. All nine units will employ SCR to meet the emission limit of the rule.
- Older units nearing useful life expectancy may not be economical able to retrofit with SCR and it may be more cost effective to replace these older units with new units that incorporate SCR as a complete replacement package.
- Real property space where the units are located could impede installation of SCR especially if the existing space is limited or if a new location has to be sited.
- Other constraints not known at this time may have to be considered when deciding the implementation schedule for this control measure. Constraints such as longer lead-time to design, manufacture, deliver and install the technology could affect early implementation of lower limits.

Recommendation:

- Staff recommends this source category be controlled through regulatory method with implementation schedule not earlier than 2012 due to constraints discussed above.
- An estimated 40% reduction from current emissions level could be achieved by lowering the NOx emission limit to 6 ppmv for units greater than 20 MMBtu/hr by using SCR or SNCR.
- Consider inclusion of an alternative compliance option to improve cost effectiveness of this control measure.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	0.0	0.0	0.69	0.72	0.75	0.77	0.80
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

- The rule has no VOC reductions because this is a NOx reduction rule strategy.

Boilers, Steam Generators, and Process Heaters, 2 - 5 MMBtu/hr (S-COM-2)

(Electrical Utilities, Cogeneration, Oil & Gas Production – Combustion, Petroleum Refining – Combustion, Manufacturing & Industrial, Food & Ag Processing, Service & Commercial, Other – Fuel Combustion)

Source Category:

This source category includes a wide range of industries including but not limited to medical facilities, educational institutions, office buildings, prisons, military facilities, hotels and industrial industries.

Emissions Inventory:

- The emissions inventory for medium size boilers (2-5 MMBtu/hr) is assumed to be included as part of the inventory for S-COM-1 (large boilers - from units rated at 5 MMBtu/hr or less); please refer to that control measure write-up for the baseline emissions from boilers as a whole.
- Current Rule 4307 requires registration of small units pursuant to new District Rule 2250. When registration is completed within the next 3 years and the total number of medium size units has been determined, the District will calculate the emissions and then update the emissions inventory for this source category.
- EICs Affected: 010-005-0110; 010-005-1220; 030-005-0110; 030-005-0124; 030-005-0130; 030-005-1220; 030-005-1530; 030-010-0110; 030-010-1600; 030-015-0110; 030-015-0130; 040-005-0110; 040-005-0130; 040-010-0100; 040-010-0110; 040-010-1000; 050-005-0110; 050-005-0122; 050-005-0124; 050-005-0300; 050-005-1220; 050-010-1220; 050-010-1224; 052-005-0110; 052-005-0122; 052-005-0124; 052-005-1220; 052-005-1510; 052-005-1520; 052-010-0110; 052-010-0120; 052-010-1224; 060-005-0110; 060-005-0122; 060-005-0124; 060-005-0144; 060-005-0320; 060-005-1220; 060-005-1520; 060-010-1220

Current Control:

- District Rule 4307 sets NOx limits at 30 ppmv effective in 2009. This is approximately 70% NOx control from uncontrolled levels. Units operated at schools kindergarten through 12th grade are exempt.

Future Control Options:

- The current Rule 4307 limits are achievable by retrofitting units with commercially available Low NOx Burner combustion control technology that achieves a 70% reduction from uncontrolled level.
- Ultra Low NOx Burner could achieve lower emission level but may not be available for retrofit of all units, specifically smaller, newer units.
- Replacement of older existing units with new ones that already integrate low NOx technology is possibly the more cost effective control options to that of retrofitting existing units.
- Replacing with electric heaters is also an option since almost all facilities are in areas connected to existing commercial electric grid system.

Future Incentive Options

Additional reductions can be achieved by providing incentives for replacement and retrofit of school boilers. Staff's preliminary assessment indicates at least 380 school boilers in the District with estimated uncontrolled NOx emissions of 0.8 tons/day.

Boilers, Steam Generators, and Process Heaters, 2 - 5 MMBtu/hr
(Continued)

- Electric heaters were not considered because of the increased operational costs associated with electrification

Incentive Option	# of Units	MMBtu/hr	Capacity Factor	Emissions (tons per day)	Emission Reductions (tons per day)	Total Cost	Capital Cost	Cost Effectiveness (dollars per ton)
Low NOx Retrofit (30 ppm)	380	3.5	0.5	0.798	0.511	$17,733,460	$46,667	$11,124
Low NOx Replacement (30 ppm)	380	3.5	0.5	0.798	0.511	$24,553,700	$64,615	$15,402
Ultra Low Nox Replacement (15 ppm)	380	3.5	0.5	0.798	0.694	$57,000,000	$150,000	$26,327

Discussion:

- These units are located at stationary sources for which the District has legal authority to regulate air emissions.
- Except for the school boilers exemption, current Rule 4307 is as stringent as other air district rules.
- The existing annual heat input threshold of 5 billion Btu per year needs to be evaluated to determine if there is a significant reduction to gain by lowering the threshold to 1.8 billion Btu/yr and if it is cost effective.

Recommendation:

- Schools districts need financial assistance to retrofit or replace aging equipment. Staff recommends controlling this source category through an incentive program. Explore opportunities for incentive funding to achieve additional emission reductions from this source category; see Chapter 7 of this Plan for additional information regarding incentive funding.

Incentives:

- Retrofit and replacement of school boilers to meet BARCT standards (30 ppm) are relatively cost effective incentive options
- Grant history indicates that participation is higher for programs that offer full replacement as opposed to retrofit
- Consider adopting a backstop rule to assure participation in the incentive program and improve cost effectiveness

Projected Reductions with or without Incentives:

Low NOx Replacement or Retrofit (30ppm NOx limit)
Tons per day – annual average

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	0.0	0.51	0.51	0.51	0.51	0.51	0.51
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Boilers, Steam Generators, and Process Heaters, Greater than 0.075 MMBtu/hr (S-COM-3)

(Electrical Utilities, Cogeneration, Oil & Gas Production – Combustion, Petroleum Refining – Combustion, Manufacturing & Industrial, Food & Ag Processing, Service & Commercial, Other – Fuel Combustion)

Source Category:
Facilities with boilers in this size range may include electrical utilities, crude oil production facilities, manufacturing facilities, and food processing facilities.

Emissions Inventory:
The emissions inventory for small size boilers (0.75 –to < 2.0 MMBtu/hr) is assumed to be included as part of the inventory for S-COM-1 (large boilers - from units rated at 5 MMBtu/hr or less); please refer to that control measure write-up for the baseline emissions from boilers as a whole.

- EICs affected: 010-005-1220; 010-005-0110; 030-005-0110; 030-005-0124; 030-005-0130; 030-005-1220; 030-005-1530; 030-010-0110; 030-010-1600; 030-015-0110; 030-015-0130; 040-005-0110; 040-005-0130; 040-010-0100; 040-010-0110; 040-010-1000; 050-005-0110; 050-005-0122; 050-005-0124; 050-005-0300; 050-005-1220; 050-010-1220; 050-010-1220-0000; 052-005-0110; 052-005-0122; 052-005-0124; 052-005-1220; 052-005-1510; 052-005-1520; 052-010-0110; 052-010-0120; 052-010-1224; 060-005-0110; 060-005-0122; 060-005-0124; 060-005-0144; 060-005-0320; 060-005-1220; 060-005-1520; 060-010-1220

Current Control: District Rule 4308 limits NOx emissions at 3% O_2 to the following:

0.075-0.4 MMBtu/hr	0.093 lb NOx/MMBtu
Between 0.4 and 2.0 MMBtu/hr	0.036 lb NOx/MMBtu

Future Control Options:

- Ultra Low NOx Burner could achieve lower emission level but may not be available for smaller unit.
- Replacement of older existing units with new ones that already integrate low NOx technology is possibly the more cost effective control options to that of retrofitting existing units.
- Replacing with electric heaters is also an option since almost all facilities are in areas connected to existing commercial electric grid system.

Discussion:

- These units are located at stationary sources for which the District has legal authority to regulate air emissions.
  Although current District Rule 4308 has a specific date for when new boilers must meet the emission limit, it does not specify the turnover of boilers in service prior to that date. This means that an existing boiler could be emitting outside the limits specified and yet still be in compliance with the rule since the boiler has not yet reached the end of its service life, therefore is not a “new” boiler. Mandating

Boilers, Steam Generators, and Process Heaters, 0.75 MMBtu/hr
(Continued)

a specific date that all boilers in this size range must meet the current emission limit would allow faster turnover of the existing, in-service boilers, thereby realizing the full impact of lower NOx limits already in place sooner than under natural unit attrition. At full implementation, NOx emission reductions were estimated to be 2.0 tons NOx per day, or about 60% of the estimated baseline inventory of 3.3 tons per day.

- Mandating conversion to electric boilers could be a possibility for this source category. Further study is needed to determine the most cost effective way to implement the standard for these units.

Recommendation:

- Accelerate the replacement of older units with new units meeting the Rule 4308 NOx emission rate limits by a rule-based requirement (e.g. no units operating within the District that are 10 years or older, unless a certain emission rate can be demonstrated) or by the use of incentives or a combination of both strategies.
- Explore possibilities of converting to electric boilers, and implement options that are cost effective and socioeconomically viable.
- Based on the current emissions inventory or lack thereof, control level, and existing technology, emission reductions are not quantifiable for this source category. However a future study to re-evaluate this source category is planned.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Solid Fuel Boilers, Steam Generators, and Process Heaters (S-COM-4)

(Electric Utilities, Cogeneration, Service and Commercial)

Source Category:

This source category includes facilities that operate boilers, steam generators, and process heaters (units) that are fired on solid fuel. These units are used in facilities that generate utility and industrial power (electricity and heat) by burning solid fuels including petroleum coke, coal, municipal solid wastes, tires, or biomass wastes.

Emissions Inventory:

With current controls and regulations: does not reflect reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	4.0	4.0	4.1	4.1	4.1	4.1	4.2	4.2
VOC	0.406	0.408	0.409	0.409	0.409	0.411	0.413	0.413

ARB emissions inventory needs to be validated to account for NOx reductions resulting from existing boiler permit NOx limits as well as current Rule 4352 limits.

- EICs Affected: 010-005-0214; 010-005-0240; 010-005-0243; 010-005-0254; 020-005-0214; 020-005-0218; 020-005-0220; 020-005-0230; 060-005-0250

Current Control: District Rule 4352 requires municipal solid waste units to meet a NOx limit of 200 ppmv @ 12% CO2. For all other units the NOx limits is 115 ppmv @ 3% O2.

Future Control Options:

- Current BACT is selective non-catalytic reduction (SNCR) with ammonia injection for municipal waste-fired or biomass-fired boilers. Sources subject to Rule 4352 are already operating at or below the limits by using this control technology.
- Reexamine if the NOx emission limits from Sacramento AQMD (70 ppmv) or ARB recommendations (40 ppmv) are achievable for this source category.
- There is some increased use of selective catalytic reduction SCR with ammonia injection in new coal-fired boilers in eastern states in the nation. European Best Available Technology (BAT) listed SCR for coal and lignite firing boilers.
- There are no biomass-fired or municipal waste-fired boilers that are currently using SCR in the nation or in Europe.
- Coal -fired units are not comparable to the District's biomass fired or municipal solid waste fired boilers, which are non-homogenous fuel and therefore higher emission variability.
- Further research would need to be conducted to determine if SCR could be retrofitted to the existing boilers or if they also need combustion retrofits that would require boiler rebuilds.

Discussion:

- These sources are located at stationary sources for which the District has legal authority to regulate air emissions.

Solid Fuel Boilers, Steam Generators, and Process Heaters
(Continued)

- Rule 4352 was recently amended to implement BARCT and All Feasible Control Measure as a commitment in the District's One-hour Extreme Ozone Attainment Demonstration Plan. A discussion of possible NOx emission levels and controls was included in the analysis for that rule amendment project.
- Facilities subject to Rule 4352 operate boilers that burn locally generated agricultural waste and municipal waste materials as well as waste materials imported into the Valley. Continued operation of these facilities is important to reduce emissions from open burning.

Recommendation:

- District staff recommends this source category as control measure for further study to determine if SCR could be retrofitted to existing biomass and municipal waste fired boilers.
- If SCR retrofit is feasible consider including an alternate compliance option as part of this control measure to improve cost effectiveness.
- Based on the current emissions inventory or lack thereof, control level, and existing technology, emission reductions are not quantifiable for this source category. However a future study to re-evaluate this source category is planned.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Stationary Gas Turbines (S-COM-5)

(Electric Utilities, Cogeneration, Oil & Gas Production – Combustion, Petroleum Refining – Combustion, Manufacturing & Industrial, Service & Commercial, Other – Fuel Combustion)

Source Category:
This source category includes any operations that use stationary gas turbines for the generation of electrical power.

Emissions Inventory:
With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	8.4	4.8	5.0	5.1	5.2	5.3	5.6	5.7
VOC	0.64	0.67	0.68	0.68	0.68	0.71	0.74	0.76

- EICs Affected: 010-045-0110; 020-045-0110; 030-045-0110; 030-045-1200; 040-045-1412; 050-045-1200; 060-045-0110; 060-045-1420

Current Control:
- District Rule 4703 is as stringent as other air districts for similar source category.
- Rule 4703 applies to stationary gas turbines with rated 0.3 megawatt (MW) and/or a maximum heat input greater than 3 MMBtu/hr.
- Current NOx limits are: For gas fuel-fired turbines – Standard limit is 5 ppmv to 50 ppmv, depending on turbine size, hours of operation, and control system used. Enhanced limit for >10MW combined cycle is 3 ppmv. For Liquid fuel-fired turbines – 25 ppmv to 50 ppmv, depending on turbine size, hours of operation, and control system used.
- Exemption includes laboratory turbines used exclusively in turbine technology research, turbines used exclusively for fire fighting and/or flood control, emergency turbines operated $\leq$ 200 hours per year, and turbines rated $\leq$ 4 MW and limited to operations of $\leq$ 877 hours per year.
- The current rule limits achieve about 95% NOx reduction from uncontrolled level.
- Full compliance with the current rule requirements occurred in 2002 to 2005, depending on turbine size, hours of operation, control system used, and turbine efficiency.
- Existing turbines in the SJVAB generally control NOx emissions through water or steam injection, dry low-NOx combustion technology, selective catalytic reduction, or some combination thereof.

Future Control Options:
- Currently, Rule 4703 is undergoing rule development process as a control measure in the 1-hour Extreme Ozone attainment Demonstration Plan (EOADP). The control measure would specifically examine controls for turbines rated less than 10 MW and used for distributed power generation in order to achieve additional NOx reduction.

Stationary Gas Turbines
(Continued)

- ARB recently published emission standards for turbines used in electrical power generation. Current Rule 4703 limits would be evaluated in comparison with the ARB suggested limits and determine if they are attainable by existing turbines by available control technology as well as new burner technology that may be under development.
- Adoption for this control measure is anticipated in the third quarter of 2007 with full implementation for NOx control projected for the year 2010. The emissions from sources affected by the control measure are estimated at 2.5 tons NOx/day which is estimated at 50% of the sources. Upon final implementation by 2010 of the proposed control measure, a reduction of 0.6 tons of NOx per day is anticipated.
- Future rule amendment projects should reexamine the low-use turbine emission levels to determine if they are still a valid consideration for this category of units.

Discussion:

- The District has legal authority to regulate this source category.
- As stated above, this control measure is currently undergoing rule development process to evaluate feasibility of ARB suggested NOx limits for stationary gas turbines, rated <10.0 MW and amend the rule appropriately. Turbines rated greater than 10 MW are subject to requirements similar to the ARB limits.

Recommendation:

- Continue current rule development and adopt amendments to Rule 4703 by third quarter 2007.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	0.0	0.60	0.60	0.61	0.64	0.66	0.68
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

- No VOC reduction because Rule 4703 is a NOx control rule and does not regulate VOC emissions.

Reciprocating Internal Combustion Engines (S-COM-6)

(Cogeneration, Oil & Gas Production – Combustion, Petroleum Refining – Combustion, Manufacturing & Industrial, Food & Ag Processing, Service & Commercial, Other – Fuel Combustion)

Source Category:

This source category includes all reciprocating internal combustion engines. District Rule 4702 covers engines greater than 50 brake-horsepower (50 bhp), a portion of all possible engines.

Emissions Inventory:

With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	31.80	31.58	29.77	29.12	27.72	25.52	23.18	20.69
VOC	5.29	5.25	5.19	5.17	5.15	5.15	5.17	5.21

- ARB emissions inventory for engines 50 bhp or less are not included in the emissions inventory. Survey of businesses and industries needs to be conducted to determine the total number of small engines in order to calculate their uncontrolled emissions.
- Survey of AO sources needs to be conducted to determine total AO spark-ignited engines and update the emissions inventory. Preliminary data received from a stakeholder indicates at least 1,000 AO spark-ignited engines operating within the District.
- EICs Affected: 010-040-0110; 010-040-1200; 020-040-0110; 020-040-1200; 030-040-0100; 030-040-0110; 030-040-0124; 030-040-1100; 030-040-1200; 030-040-1210; 040-040-0110; 050-040-0012; 050-040-0110; 050-040-0124; 050-040-1200; 050-040-1299; 050-040-3220; 052-040-0110; 052-040-1200; 052-042-1200; 060-040-0012; 060-040-0110; 060-040-0124; 60-040-0146; 060-040-1100; 060-040-1200; 060-040-1210

Current Control:

- District Rule 4702 regulates NOx emissions from stationary spark-ignited engines and stationary compression ignited (diesel) engines greater than 50 horsepower.
- NOx limits for spark-ignited engines used exclusively in agricultural operations (AO) are: Rich burn– 90 ppmv or 80 percent reduction; lean-burn– 150 ppmv or 70 percent reduction. The full compliance schedule for AO engines is 2008, or 2010 if an operator has an agreement to replace existing engine with electric motor.
- For non-AO spark-ignited engines: Rich-burn – 25 ppmv or 96 percent reduction; lean-burn – 65 ppmv or 90 percent reduction. The full compliance schedule for non-AO engines is 2007.
- NOx limits for compression ignited engines are: for non-EPA certified engines greater than 500 bhp and at least 1,000 annual operating hours – 80 ppmv and a full compliance schedule of 2008; 50 bhp to 750 bhp operating less than 1,000 hours

Reciprocating Internal Combustion Engines
(Continued)

per year – EPA certified Tier 3 to Tier 4 depending engine size and a compliance schedule of 2010 or 2011 based on engine size. For EPA certified compression ignited engines: EPA certified Tier I or Tier 2 must comply with Tier 4 standard by 2015 or 12 years after installation date whichever is later.

Future Control Options:

- Electrification - replacing engines with electric motors - where possible.
- Lower agricultural spark-ignited engine NOx emission limits to the same level as the non-agricultural units.

Discussion:

- These units are located at operated and located at stationary sources for which the District has legal authority to regulate air emissions.
- Current Rule 4702 is as stringent as other air district rules.
- Additional NOx reductions could be achieved by expanding the rule applicability so that engines 50 bhp or less would be subject to the rule. A survey would need to be conducted to determine the number of small engines and estimate the uncontrolled emission levels for such engines.
- Electrification should also be considered as part of a strategy to reduce engine emissions. Utility companies are currently in the process of electrifying over 1,000 agricultural diesel engines.
- Technical and economic conditions may limit the application of electric motors in some locations and possible impacts to the power grid should be examined.
- Current Rule 4702 goes beyond the State Suggested Control Measure for this source category.

Recommendation:

- Accelerate the replacement of engines with electric motors, either through regulatory or incentive programs. Explore opportunities for incentive funding to achieve additional emission reductions from this source category; see Chapter 7 of this Plan for additional information regarding incentive funding.
- The reduction estimate for controlling engines 50 bhp or less would be determined after completing a survey of sources and establishment of the emission inventory for these engines. A future study to re-evaluate this source category is planned.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Glass Melting Furnaces (S-COM-7)

(Glass and Related Products)

Source Category:
This source category includes any glass-melting furnace. Within the District, there are four types of glass produced: container glass (bottles and jars), flat glass (windows and automobile windshields), wool fiberglass (building insulation), and continuous strand fiberglass (aircraft insulation and filter media for air and water).

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	9.38	8.02	8.56	8.73	9.08	9.64	10.12	10.65
VOC	0.337	0.39	0.415	0.423	0.440	0.469	0.49	0.515

- EICs Affected: 460-460-7037, 460-460-7038, 460-460-7039

Current Control: Rule 4354 regulates the glass melting category. NOx emission limits range from 4.0 to 9.2 pounds NOx per ton of glass pulled, depending on production technology, firing technology, and monitoring averaging period. VOC emission limits are 20 ppmv or range from 0.1 to 0.25 lb/ton glass pulled depending on market sector and firing technology. Operators meet current emission limits through a selection of furnace firing technology and glass raw materials.

With recent rule amendments, Rule 4354 applies to all industrial glass-melting furnaces in the District. The NOx emissions are controlled 67% to 76% compared to uncontrolled glass-melting furnaces.

Future Control Options:
- Oxy-fuel, 3R technology, Selective Catalytic Reduction, electric furnaces.

Discussion:
- Lower NOx emissions have been achieved within the District with current firing technology and glass recipes.
- Selected Catalytic Reduction (SCR) is an add-on control that may help operators meet lower NOx limits. SCR has been used by other source categories to reduce NOx emissions. Glass melting furnaces in Europe and Asia have successfully used SCR to control NOx emissions, but to date; no facility in the US has implemented this control technology.
- During the rule development process, District staff will consider:
    - NOx limits of 3 lbs/NOx per ton of container glass pulled and 5 lbs/NOx per ton of flat glass pulled.
    - Changing the averaging period for emissions to no more than 3 hours.
    - Reducing the maximum allowable start-up time to a few days.
    - Implementing a specific SOx emission limit.

Glass Melting Furnaces
(Continued)

- Operators have increased production capacity during the most recent round of rebuilds, triggering Best Available Control Technology (BACT) provisions of the District's New and Modified Stationary Source Review (NSR) Rule. The BACT provisions have resulted in NOx emission limits that meet or are less than the 3 & 5 lbs/NOx per ton of glass pulled. The emissions reductions from the most recent rebuilds will be realized starting in 2008.
- There are four furnaces with NOx limits greater than these limits that District staff expects will be rebuilt by 2012: three container glass furnaces and one flat glass furnace. The most cost-effective time to change NOx limits for glass-melting furnaces is at the time of furnace rebuild. To ensure that all glass-melting furnaces in the District meet the by 2012, it is recommended that the rule development project be completed by 2009.
- When fully implemented, District staff has estimated that actual NOx emission reductions from rule amendments would be an additional 0.4 tons per day beginning in 2012.

Recommendation:
This control measure is recommended as a candidate control measure with rule development occurring by 2009 so that rule requirements are in place by the 2012.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	1.2	1.20	1.6	1.7	1.8	1.9	2.0
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Lime Kilns (S-COM-8)

(Food & Ag Processing)

Source Category:
This source category pertains to facilities operating lime kilns in a wide variety of manufacturing and processing operations, including food and agriculture.

Emissions Inventory:
With current controls and regulations: does not reflect reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

EICs Affected: Need to assign an EIC because lime kiln is not included in the ARB emissions inventory. There is only one device operating in the District and it currently complies with the rule associated with this device.

Current Control: District Rule 4313 requires NOx: 0.12 lb/MMBTU-gaseous fuel; 0.12 lb/MMBTU-distillate fuel oil; 0.20 lb/MMBTU-residual fuel oil

Future Control Options:

- Future control option includes lowering the current NOx emission limits.
- Available retrofit combustion control technologies to achieve lower NOx limits include low NOx burner and ultra low NOx burners fired on natural gas. Add-on controls such as SCR or SCNR is technologically feasible but its cost effectiveness should be examined for this application.

Discussion:

- These sources are located at stationary sources for which the District has legal authority to regulate air emissions.
- There is only one permitted lime kiln operating in the District. The kiln is operated only during ozone season to manufacture sugar.
- The current permit allows firing on distillate fuel oil (#6 fuel oil) as primary fuel and natural gas as back-up fuel.
- Current NOx limit of 0.1 lb/MMBtu is considered uncontrolled emission limit.
- Lower the NOx limits to at least 0.036 lb/MMBtu (30 ppmv) fired on natural gas fuel and 0.052 lb/MMBtu (40 ppmv) fired on liquid fuel (residual fuel oil or distillate oil), at 3% excess oxygen.
- Require firing on natural gas as primary fuel. Distillate oil firing as a back-up fuel could be allowed during natural gas curtailment period.
- A reduction of about 64% from current emissions level could be achieved by lowering the NOx limit to at least 30 ppmv for natural gas firing.
- A reduction of about 75% from current emissions level could be achieved by lowering the NOx limit to at least 40 ppmv for distillate oil firing.

Lime Kilns
(Continued)

Recommendation:

- Staff recommends this source category be controlled through regulatory method with implementation schedule not earlier than 2012 to allow time to design, procure, and install retrofit control technology. Compliance schedule for the new emission limit should coincide during off-season when the kiln is not operating so retrofit could be completed without disrupting normal manufacturing operations.
- Amend Rule 4313 to lower the NOx limits. A reduction of between 64% to 75% from current emissions level from this source category could be achieved by combustion control retrofit technologies discussed above depending on the type of fuel (natural gas or distillate) used to fire the unit.
- Consider inclusion of an alternative compliance option to improve cost effectiveness of this control measure.
- Based on the current emissions inventory or lack thereof, control level, and existing technology, emission reductions are not quantifiable for this source category. However a future study to re-evaluate this source category maybe planned in the future.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Residential Water Heaters (S-COM-9)

(Residential Fuel Combustion)

Source Category:
Units in this source category are water heaters located in private residences.

Emissions Inventory:
With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	1.37	1.27	1.30	1.31	1.33	1.36	1.39	1.42
VOC	0.10	0.11	0.11	0.11	0.111	0.11	0.12	0.12

- EIC Affected: 610-608-0110

Current Control: District Rule 4902 currently requires natural-gas fired, new residential water heaters, which are rated at less than 75,000 BTU heat input not to exceed 93 pounds of NOx emissions per billion Btu (lb of NOx/bBtu) of heat input.

Future Control Options:
- New water heaters are designed to be more energy efficient and emit less NOx, using low-NOx combustion technology.
- Electrification – replacement with electric water heaters – could also significantly lower NOx emissions.
- Encourage early replacement of exiting units using either a specific compliance schedule or incentive funding.

Discussion:
- Lower NOx limits are currently in place in SCAQMD Rule 1121 which have been in place since September 3, 2004.
- Because of the tendency for manufacturers to supply SCAQMD-complying products for the entire state, many new water heaters in the San Joaquin Valley may already meet the new limits.
- Nonresidential water heaters and mobile home heaters are exempt from current rule requirements, although these applications generally use similar water heating devices.
- The transition from older to newer, less NOx-emitting units will take place over a 20-year period.
- Manufacturers have indicated that they need more time to develop the technology that meets the NOx limit of 23 lb of NOx/bBtu, and in a mitigation fee program, they are required to compensate the SCAQMD for units sold that don't meet these new limits.
- The reductions are mainly NOx; the VOC reductions are negligible.
- The reductions reflect controls that come by natural attrition of the units, which is projected to take 20 years.
- The reductions are based on 75% reduction of NOx (93 to 23 lb of NOx/bBtu) for the additional applicable units.

Residential Water Heaters
(Continued)

Recommendation:

- Amend Rule 4902 to lower the NOx emission limit, similar to SCAQMD Rule 1121, and also expand its applicability to nonresidential and mobile home heaters, but consider technological limitations.
- Expand the applicability by including nonresidential water heaters less than 75,000 BTU heat input, which will be subject to the new, lower limits and by removing the exemption for mobile home heaters, which can be required to meet the current limit of 93 lb of NOx/bBtu.
- Currently this source category is not a candidate for incentive funding, but further analysis and study is necessary to determine if this source category may garner cost effective reductions in the future provided funding sources are available. Please see Chapter 7 for any additional information.
- Adoption of amendments for the new requirements must be done as soon as possible, in order for the attrition of the older units to start. This early adoption will also assist in the effort to reach the PM2.5 NAAQS, since NOx is the precursor of concern that forms secondary particulates.

Projected Reductions:

With recommended controls

Emissions Reduction, Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	0.0	0.20	0.25	0.40	0.55	0.70	0.85
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Natural Gas-Fired, Fan-Type Residential Central Furnaces (S-COM-10)

(Residential Fuel Combustion)

Source Category:

This source category covers natural gas-fired, residential central heating furnaces. These units are in the size range of rated heat input capacity of less than 175,000 British thermal units per hour and, for combination heating and cooling units, a rated cooling capacity of less than 65,000 British thermal units per hour.

Emissions Inventory:

With current controls and regulations: does not reflect the reductions from the proposed control.

Tons per day – winter season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	4.214	4.121	4.032	3.999	3.934	3.807	3.666	3.5
VOC	0.208	0.204	0.199	0.198	0.194	0.188	0.181	0.173

Current Control:

- Adopted on October 20, 2005, Rule 4905 limits NOx emissions from residential central furnaces.
- The main rule requirement is written, as follows: No person shall supply, sell, offer for sale, install, or solicit the installation of any natural gas-fired fan-type residential central furnace for use within the District unless it has certified emissions of oxides of nitrogen less than or equal to 0.093 pounds of oxides of nitrogen per million BTU heat output or 55 ppm NOx at 3.00% O_2 stack gas by volume (dry).

Future Control Options:

- Low-NOx burner technology, capable of emitting half of the certified level of 0.093 pounds of NOx per million BTU heat input, has been developed, but it has not reached the commercially-available stage.
- Incentivize the use of more efficient “condensing” heating units, which have Annual Fuel Utilization Efficiency (AFUE) upwards of 90%, in contrast to “noncondensing” units that have 78% AFUE.
- State-of-the-art control systems that minimize energy use.

Discussion:

- Since emissions from this source category occur during the cold season, it is not relevant to the control of ozone, which is a summer problem and should be pursued as part of the future PM2.5 plan development.
- NOx from heating furnaces using natural gas contribute to the formation of PM2.5, which is a winter phenomenon.

Natural Gas-Fired, Fan-Type
Residential Central Furnaces
(Continued)

Recommendation: This control measure should be pursued as part of a future PM2.5 plan development strategy and not part of this ozone plan.

Projected Reductions: To be developed as part of the PM2.5 plan development strategy.

Tons per day – winter season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Dryers (S-COM-11)

(Mineral Processes, Other – Industrial Processes)

Source Category:
This source category includes any dryer, dehydrator, or oven. Some examples of units subject the this rule are onion dehydrators, dryers that convert liquid milk to dried milk, and units used to dry aggregate at asphalt plants.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	2.512	2.631	2.794	2.836	2.965	3.082	3.244	3.390
NOx adj	2.51	2.63	1.85	1.88	1.97	2.05	2.14	2.25
VOC	0.389	0.417	0.440	0.446	0.469	0.486	0.512	0.539

*The adjustment reflects the reductions achieved from the recently adopted Rule 4309

- EICs Affected: 430-422-7078, 430-424-7006, 430-995-7000, 499-995-0000, 499-995-5630

Current Control: District Rule 4309 requires dehydrators to be fired on PUC-quality natural gas; all others units have a NOx emission limit of 3.5 to 5.3 ppmv using an oxygen correction factor. Operators may meet NOx emission limit using a NOx emission control system.

Because this rule was recently adopted, no estimation has been made of the proportion of additional units that are at least 5 MMBtu/hr or larger that will be subject to this rule. At full implementation of the current rule requirements, NOx emissions from units subject to the rule are estimated at 66% of uncontrolled emissions.

Future Control Options:
- No new technologies that are not currently specified under current controls are known at this time.

Discussion:
- Low-NOx burners are already in use for sources subject to rule provisions. Some of the sources that are currently exempt from the rule are already using this technology as part of their Permit to Operate.
- The bulk of the dryers, dehydrators, and ovens operate at temperatures that are too low for efficient operation of NOx emission control systems, therefore add-on controls are not an option for this source category.
- Some currently exempt units operate for a short limited season, for example, dryers and humidifiers at cotton gins, so the amount of NOx emission reductions from these units would be small since nearly all exempted units run on PUC natural gas which is a clean burning technology.

Dryers
(Continued)

- Another option for this rule is to change the rule applicability by reducing the total heat input cut-off for units subject to the rule below the current 5.0 MMBtu/hr. As the heat input cut-off decreases, the sources that would be affected by the rule become more diverse. For example, commercial laundry dryers and ovens for pre-packaged tortillas are units that are in the range of 2 to 3 million Btu/hr. Since the industries would be varied, more analysis would be needed throughout the rule development project to adequately assess the technology available for these lower heat input units. Nearly all of the exempted units are firing on PUC-quality natural gas already, which is a very clean-burning technology.

Recommendation:

- The recent adoption of this rule has maximized the possible emission reductions from this source category. Future equipment advancements may produce additional reductions from exempt equipment. A future study to re-evaluate this source category is planned.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Alternative Energy Production Programs (S-COM-12.0)

(Landfills, Confined Animal Facilities, Agricultural Waste Products, Waste Water Treatment Plants, Industrial Coating Facilities)

Source Category:

This source category includes facilities or operations that have VOC-containing by-products that can be converted to electric energy by utilizing currently available technology or other byproducts such as biomass waste, from which energy could also be derived. The electricity produced may be used for internal facility needs or metered back and sold to utility companies.

Emissions Inventory:

There is no specific inventory attributable to this source category, since it can include any application for which there is technology that can produce energy without using fossil-based materials.

Current Control:

- Landfill gas is either flared or used as fuel for electric generation systems.
- VOCs and methane from confined animal facilities are controlled by a variety of mitigation measures or used, to a limited extent, as fuel for electric generation systems.
- Agricultural waste products, such as prunings, rice stalks, and uprooted vines and trees, are handled in a variety of ways, including: chipped/shredded, composted, burned, or used, to a limited extent, as fuel for boilers or power generation units.
- Solar energy projects, such as: solar-driven water pumps, solar roof, and solar water heating.
- VOCs from oil and gas production plants and VOCs from other industrial facilities are incinerated using flares or thermal oxidizers.

Future Control Options:

- Small-scale alternative energy projects that utilize locally available biomass that can be converted to methane gas, which can be used to fuel internal combustion (IC) engines or mini-turbines that drive electricity generators or which can serve as the hydrogen source for fuel cell power generation.
- VOC emissions from industrial painting processes as a hydrogen source for fuel cell power generation.
- Biomass gasification produces flammable gas that can be used in combined-cycle power generation, which combine gas turbines and steam turbines to produce energy up to as much as 60% efficiency.
- Still in the development stage is the use of biomass in biorefineries. Biomass can be transformed to component sugars that can be converted to fuels or other products, and biomass can also be converted to synthesis gas (hydrogen and carbon monoxide), which can be used for fuel or converted to other products.
- Advances in gas-to-liquid technologies using the cobalt-based Fischer-Tropsch (FT) process has led to the production of synthetic paraffin fuel (SPF), which is a promising hydrogen source for fuel cell power generation. This fuel type is being

investigated for its potential in mobile applications of fuel cells. SPF can be derived from synthesis gas, from petroleum-based products, from methane produced by biodigesters, or from the gas currently being flared at oil production facilities. Other FT fuels are touted as future alternative replacements for diesel and aviation fuel, with the concomitant benefit to air quality, since FT fuels are cleaner burning (less NOx, PM, and CO).

Discussion:

- Technology exists to convert green waste, dairy manures, and other forms of biomass into useable energy for electricity generation. However, these projects currently require considerable subsidies to make them economically viable.

This is due mainly to the still relatively lower cost of producing electricity using fossil-based stocks.

- Biomass, if left exposed to the atmosphere, can transform to ozone precursor forms, such as VOC hydrocarbons. Another hydrocarbon formed from biomass decomposition is methane, which is not an ozone precursor, but is considered as one of the stronger chemical compounds that contribute to global warming. A molecule of methane contributes twenty times more to global warming than a molecule of carbon dioxide.
- IC engines and mini-turbines that drive electricity generators produce significant amounts of NOx and VOCs, if emission control devices are not utilized.
- In some cases, landfill gases are used to fuel IC engines that power electricity generators. However, there is still a considerable amount that is flared to control for VOCs, a method that is less pernicious than just simple off gassing, but still produce NOx.
- There are several examples of biodigester technology using animal waste as methane source, with a concomitant benefit of controlling VOCs.
- Waste Water Treatment Plants are currently not subject to District prohibitory rules for VOCs, and therefore VOC emissions are uncontrolled.
- There are currently projects that use methane as the source of hydrogen in fuel-cell power generation. One such project is being done by the city of Tulare's wastewater treatment plant. The project uses cheese-processing milk waste, which organisms break down to produce methane as a byproduct. The project was awarded a $3.38 million grant by the Southern California Edison for producing energy in a nonpolluting way. It appears that the VOCs in the methane-laden waste gas also are a source of the hydrogen that the fuel cells utilize to produce electricity. Obviously, no NOx is produced, since the byproducts of fuel-cell power generation are water and smaller amounts of carbon dioxide (relative to combustion processes of producing energy). In a Ford Motor Company research project that compared the use of fuel cell technology to the traditional use of thermal oxidizers in controlling VOCs from the painting process, the VOC and CO2 from the fuel cell technology were considerably less.

- The economic viability of alternative energy projects will be improved with the emerging greenhouse gas policy that awards equivalent carbon credits, which have a corresponding value in the carbon emissions trading markets.

Recommendation:

- Promote alternative sources of energy by assisting projects with incentive funds, provided these projects have demonstrable merits, in terms of reducing criteria pollutants that are precursors to ozone formation.
- Design and implement alternative energy programs with SIP creditability as an emerging control measure, following EPA guidelines.
- Align District programs with initiatives that reduce global warming.
- See Chapter 8, Innovative Strategies and Programs, for additional information on this source category.

Projected Reductions:

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Energy Conservation Programs (S-COM-12.1)

(All energy users)

Source Category:
This source category includes equipment, facilities or operations that are amenable to energy conservation programs, including agricultural irrigation systems, residential water-heating systems, farming practices, commercial/industrial practices, and all other operations that can reduce energy usage.

Emissions Inventory:
There is no specific inventory attributable to this source category, since it can include any application for which there are technologies and practices that can improve energy use.

Current Control:

- Utility companies have various energy conservation programs, including offering rebates for using energy-efficient appliances and weatherization of homes, and a tiered system of pricing, which encourages homeowners to stay below a certain level of energy use.
- EPA's Energy Star Program provides homeowners and businesses with tools and resources for undertaking projects that reduce energy bills and improve comfort. The Energy Star label is awarded to products and facilities that have a demonstrated quality of energy efficiency.
- California State University, Fresno's Center for Irrigation Technology conducts the Agricultural Pumping Efficiency Program, with funding from Pacific Gas and Electric Company through 2008.
- Green building practices that are geared toward energy conservation, such as: site selection, building orientation, integrated structural insulation, and use of renewable energy options (solar space heating and cooling, solar water heating, purchase of green power, etc.).

Future Control Options:

- Energy efficiency projects and practices that have a demonstrable benefit to air quality, such as: energy efficient water pumps, solar water heaters, reduced agricultural field passes, use of GPS in agricultural operations, and other conservation management practices that simultaneously reduce PM and ozone precursors.
- Green certification of energy efficient homes, offices, and commercial and industrial facilities that utilized green building practices.

Discussion:

- By reducing electric usage, the construction of more power plants can be slowed down, thereby contributing to less NOx and CO_2 emissions.
- Increasing the efficiency of agricultural irrigation pumps translates to less fuel usage, which results in fewer emissions of ozone precursors. This would complement District Rule 4702's clean engine requirements.

Energy Conservation Programs
(Continued)

- Conservation management practices, such as reduced tillage, use of GPS, reduced row passes in cultural practices (pesticide application, cultivation, row cleaning/weeding), etc. results in less fuel usage and fewer ozone precursor emissions.
- Equivalent carbon credits that result from energy conservation projects are now worth a certain amount of dollars in greenhouse gases trading schemes. This vastly improves the economic viability of such projects.

Recommendation:

- Promote energy conservation through program mechanisms, such availability of rebates and other incentives to green-certified homes and buildings.
- Provide incentive funding for irrigation pumping efficiency programs and other farming technologies/practices that have a demonstrable air quality benefit.
- Design and implement energy conservation programs with SIP creditability as an emerging control measure, following EPA guidelines.
- Align District programs with initiatives that reduce global warming.
- See Chapter 8, Innovative Strategies and Programs, for additional information on this source category.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Heat Island Mitigation Programs (S-COM-13)

(Cool or Green Roofs, Cool Pavements, Urban Forestry)

Emissions Inventory:
There is no specific inventory attributable to this source category, since it can include any application for which exist technology or other means that can lower temperatures in urban areas.

Current Control: Planting shade trees in urban areas are done, but only to a very limited extent, in contrast to what is necessary to mitigate the formation of heat islands (characterized by urban air and surface temperatures, which can be 10 ºF higher than rural areas).

Future Control Options:
- Cool roofs with a high solar reflectance, or albedo.
- Green roofs or rooftop gardens, which are "living roofs" planted over existing roof structures, including industrial and commercial facilities, residences, and offices.
- Cool pavements, a term describing light-colored or permeable pavements.
- Urban forestry, which decreases ambient temperatures through shading and evapotranspiration.

Discussion:
- Heat islands can increase air conditioning demand, power plant emissions, and ground-level ozone formation, which is heat dependent.
- EPA's Energy Star Roof Product Program specifies albedo values.
- Green roof benefits include reduced rooftop temperatures.
- The U.S. Dept. of Agriculture Forest Service estimates that mid-day temperature reductions range from 1 to 5.5 ºF for every 15% increase in the canopy cover.
- The scientific know-how for estimating the emission reduction benefit accruing from heat island mitigation programs is still at an early stage of development.
- Research should also focus on the benefits that crop production has on ozone absorption potential, including the role of orchards as buffers.

Recommendation:
- Develop a model ordinance for heat island mitigation and promote its adoption by cities and counties, including providing incentive funding to "seed" projects.
- Encourage practices conducive to heat island mitigations through informational campaigns and incentives.
- Include elements of heat island mitigation as an alternative compliance option for facilities.
- Support research that adds certainty to the emission reduction potential or benefits of heat island mitigation programs. See Chapter 8, Innovative Strategies and Programs, for additional information on this source category.

Projected Reductions:
With recommended controls

Emissions Reduction, Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	TBD	TBD	TBD	TBD	TBD	TBD	TBD
VOC	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Composting and Biosolids (S-GOV-1)

(Other – Waste Disposal)

Source Category:
This source category includes all facilities that land apply, landfill, compost, or dispose of biosolids, manure, poultry litter, or any mixture containing the aforementioned.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC* estimated baseline	9.7	9.8	9.9	10.0	10.1	10.2	10.3	10.4

*Research is being conducted to refine the emission factors, control efficiencies, and growth factors. The estimated baseline is calculated using best available data. ARB emission inventory does not have a value for this source category.

- EICs Affected: Need to assign an EIC because this category is not included in the ARB emissions inventory.

Current Control: There is no District rule that covers this source category.

Future Control Options:
- Cover waste with finished compost, soil, or a waterproof covering.
- For Land application operations, rapidly land incorporate waste; rapidly cover waste.
- Require larger operators to maintain all piles within specific parameters or use a control device to reduce VOC emissions. The current District BACT and current rule development project for Rule 4565 list these parameters.
- Require largest operators to operate a VOC emission control device.

Discussion:
- These are stationary sources subject to the District's jurisdiction (CAA 172).
- The VOC mitigation measures listed in Future Control Options above have all been utilized in composting facilities within California. Several of the mitigation measures are in the most recent District BACT, other California air district rules, or BACT determinations by air districts in other states.
- District staff will consider South Coast's rule provisions requiring enclosed facilities to demonstrate 70-80% reductions depending on whether facility is existing or new.
- The mitigation measures listed in Future Control Options above would achieve approximately 40% VOC reduction from baseline emissions.

Composting and Biosolids
(Continued)

Recommendation:

- Expeditious compliance timeline is recommended. Facilities that choose to only implement management practices shall comply with rule requirements within 12 months of rule adoption. Facilities that choose to install and utilize VOC control devices shall comply with rule requirements within 36 months of rule adoption.
- Adopt Rule 4565 in 2007 so that the VOC emissions reductions can be realized in 2010.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC* Estimated	2.0	3.4	3.4	3.9	4.0	4.1	4.1

*****This does not include reductions achieved through incentive programs. Estimated reductions are based on the estimated baseline.

Municipal Water Treatment Plants (POTWs) (S-GOV-2)

(Waste Disposal)

Source Category:
This source category includes any facility that accepts and treats municipal or industrial wastewater including, but not limited to, sewage.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

- The emissions from the flaring of off gassing for these facilities is found in CM S-IND-21, for flares and the emissions from sewage sludge biodegradation would be found in CM S-GOV-1, composting and biosolids.

- EICs Affected: Need to investigate the appropriateness of EICs for this source category as fugitive emissions and where they are included in the ARB emissions inventory.

Current Control: Currently no prohibitory rules directly apply to this source.

Future Control Options:
- Covering and venting of tanks to a VOC control device can reduce VOC emissions by 80%.
- Regulating the pH and volatile solid parameters of the tanks or setting emission limits for tanks can reduce VOC emissions by 5%.

Discussion:
- These are located at stationary sources for which the District has legal authority to regulate air emissions.
- The aforementioned options appear to be cost effective, reflect options in BACT determinations in other California air districts, and implemented by some facilities in California.

Recommendation:
- This is recommended for further study. District staff recommends reevaluation of the emission inventory; and rulemaking if the inventory is sufficiently large to warrant rule development.
- Based on the current emissions inventory or lack thereof, control level, and existing technology, emission reductions are not quantifiable for this source category. However a future study to re-evaluate this source category is planned.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Solid Waste Disposal Site (S-GOV-3)

(Landfills)

Source Category:
This source category includes all facilities that participate in the disposal of solid waste that is placed on or below the surface of the land.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	1.6	1.7	1.8	1.8	1.9	1.9	2.0	2.1

- EICs Affected: 120-120-0240; 120-122-0242

Current Control: District Rule 4642 requires that the surface VOC concentrations be no more than 1,000 ppmv; control devices have a VOC destruction efficiency of at least 98% or reduce the VOC concentration to 20 ppmv or less; and excavated waste be covered. Emissions at active landfills; hazardous waste sites; and sites with no VOC control devices are exempt from rule requirements. This accounts for 82% of the emissions.

Future Control Options:
- Rapidly covering waste at all landfills with vapor suppressant, finished compost, or soil will reduce VOC emissions by 1% to 20%.
- Controlling moisture at all landfills will reduce VOC emissions by 5% to 10%.
- Installing a VOC control device with a capture and destruction efficiency of at least 98% at all closed solid waste disposal sites is feasible.
- Explore possible VOC control options for active landfill sites, hazardous waste sites, and other sites with no existing VOC controls.
- Implement NOx and CO limits for landfill flares

Discussion:
- These are stationary sources for which the District has legal authority to regulate air emissions.
- Requiring all facilities to implement management practices to control VOC emissions, as described above, is achieved in practice.
- Requiring control devices at closed facilities is not recommended, since VOC emissions at these sites are negligible.

Recommendation:
- Amend District Rule 4642 to require all solid waste disposal sites to implement management practices that control VOC emissions.
- Expedient rule adoption and implementation in 2017 is recommended, since the controls are limited to management practices.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Cutback, Slow Cure, and Emulsified Asphalt Paving (S-GOV-4)

(Asphalt Paving/Roofing)

Source Category:

This source category includes the manufacture and use of cutback asphalt, slow cure asphalt and emulsified asphalt for paving and maintenance operations. Typically, the hot mix asphalt is heated in special heaters and stored in tanks prior to spreading roads.

Emissions Inventory:

With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.7

- EICs Affected: 540-562-0400; 540-564-0400; 540-566-0400; 540-590-0400

Current Control:

- District Rule 4641 includes manufacture & sales prohibition for rapid cure, medium cure, some types of slow cure, and some types of emulsified asphalt.
- The rule exempts manufacture of cutback or emulsified asphalt in the manufacturing of paving material where such materials are for shipment and use outside of the District. The rule also exempts the use of medium cure asphalt when the high temperature for a twenty-four (24) hour period following the application is below 50 degrees Fahrenheit.
- Over 90% of the facilities in this source category are subject to this rule.

Future Control Options:

- Limitation on the days that asphalt paving can occur, for example limit or prohibit non-essential paving on Spare the Air Days. This will not reduce emissions, but this may prevent the violation of the Ozone standard by minimizing VOC emissions on days when the District is close to violating the ozone standard.

Discussion:

- These are stationary sources, thus subject to the District's jurisdiction (CAA 172).
- District staff estimates that removal of the low temperature exemption for medium cure asphalt would decrease VOC emissions by 2%. At least one other air district does not have a low temperature exemption for this source category.
- Several District rules have limitations on the days that certain activities can be performed. Asphalt paving is routinely delayed or scheduled around weather events; therefore, restrictions on paving during Spare the Air Days may be a possibility.

Cutback, Slow Cure, and Emulsified Asphalt Paving
(Continued)

Recommendation:

- Since this achieves VOC reductions lower than those achieved by other potential controls, full rule implementation in 2020 is recommended to allow more expedient adoption of rule with greater potential VOC reductions.
- Removal of the temperature exemption and implementation of VOC emission control systems listed above is recommended.
- Based on the current emissions inventory or lack thereof, control level, and existing technology, emission reductions are not quantifiable for this source category. However a future study to re-evaluate this source category is planned.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Composting Green Waste (S-GOV-5)

(Other – Waste Disposal)

Source Category:
This source category includes all sources that commercially compost green waste without mixing the green waste with manure, poultry litter, or biosolids.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC *Estimated Baseline	51	53	55	57	62	64	67	70

*Research is being conducted to refine the emission factors for this source category; the above estimate is based on best available data. The ARB emission inventory does not account for green waste composting.

- EICs Affected: Need to assign an EIC because this category is not included in the ARB emissions inventory.

Current Control: No prohibitory rules currently exist that address green waste composting.

Future Control Options:
- Require all facilities to implement management practices from a list of VOC control measures.
- Require facilities to install VOC emission control devices.

Discussion:
- These are stationary sources for which the District has legal authority to regulate air emissions.
- The California Integrated Waste Management Board (CIWMB) is conducting research to identify additional VOC mitigation measures for composting facilities.
- VOC emission control devices can cost over a million dollars, per site. Since most facilities have few resources, incentives may be necessary.
- The District believes that facilities can cost-effectively implement management practices that reduce VOC emissions because several facilities in the District currently use these practices.
- Air Districts have experienced significant resistance to regulation of green waste due to concern regarding the California Integrated Waste Board's (CIWMB) requirements for waste diversion; therefore time will be needed to work with the CIWMB to come to a mutually agreeable and environmentally sound method of promoting waste diversion while protecting air and water quality.
- Time is needed to allow completion of research to identify additional control measures; refine control efficiencies; and refine emission factors.

Composting Greenwaste
(Continued)

Recommendation:

- Adopt a rule requiring all facilities to implement management practices.
- Currently this source category is not a candidate for incentive funding, but further analysis and study is necessary to determine if this source category may garner cost effective reductions in the future provided funding sources are available. Please see Chapter 7 for any additional information.
- The ARB emissions inventory does not account for the emissions from this source category. Preliminary estimate by District indicates that substantial VOC emissions should be attributed to this source category possible on the order of 50 tons per day from approximately 14 existing facilities. The California Integrated Waste Management Board has contracted research to begin sometime late 2006, to refine the emission factor, activity rates, and to identify new potential control technologies from this source category.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC*	0	0	9	10	10	11	11

* Estimated reductions based on estimated baseline.

Prescribed Burning and Hazard Reduction Burning (S-GOV-6)

(Managed Burning and Disposal)

Source Category:
This source category includes activities related to prescribed burning and hazard reduction burning in wildland/urban interface areas.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	3.41	3.40	3.39	3.38	3.38	3.36	3.34	3.32
VOC	7.85	7.82	7.79	7.78	7.76	7.72	7.68	7.63

- EICs Affected: 670-666-0200, 670-667-0200, 670-668-0200, 670-670-0200

Current Control:
- District Rule 4106 has restrictions on material; burning allocations; prescribed burning requirement; permits for hazard reduction burning; smoke management plans for prescribed burning; go/no go decisions for naturally ignited Wildland Fire Use fires
- Hazard reduction burning occurs generally from late October/early November through May 1st.

Future Control Options:
- None

Discussion:
- The District has authority over this source category for emissions to the air.

- District Rule 4106 is the most stringent regulatory strategy in California for this source category.

- While the hazard reduction burning is stringently regulated, other alternatives to burning exist. Particularly for homeowners, much green waste is generated in preparing their property to meet the guidelines adopted by the California to minimize wildfire propagation. Since these properties are outside city limits, green waste collection is not usually offered as part of the county waste collection program. A few homeowners compost their own materials, but most do not. Woody materials could be chipped to make mulch, but the cost of a chipper that could process good-sized tree limbs is too costly for most residents. Therefore, the most cost-effective solution for homeowners currently is burning the dried plant materials.

Prescribed Burning and Hazard Reduction Burning
(Continued)

- This source category could be a candidate for an incentives program. Offering free or reduced cost for hauling of the green waste from private properties at the wildland/urban interface could reduce the number of hazard reduction fires at private residences. Free or reduced cost for chipping/grinding of wood-based materials should also be considered.

- Hazard reduction burning is allowed with a burn permit within the State Responsibility Area and the Federal Responsibility Area of the District. These areas are generally the foothill and mountain areas of the District. Such burning is prohibited in the Local Responsibility Area, which represents the valley floor.

- Fire Safe Councils and Resource Conservation Districts within the urban/wildland interface often receive Federal grant monies for fuel break and hazard fuel reduction programs, of which much of the accumulated materials are chipped and not burned. Examples include the Hwy 168 Fire Safe Council, the Eastern Madera Fire Safe Council, the Central Sierra Watershed Committee, the Yosemite/Sequoia Resource Conservation and Development Area, and the Coarsegold Resource Conservation District.

Recommendation:

- This source category is recommended for an incentives program without any changes in rule provisions. Explore opportunities for incentive funding to achieve additional emission reductions from this source category; see Chapter 7 of this Plan for additional information regarding incentive funding.
- The magnitude of the current emissions inventory for this source category warrants a close look at possible methods of reducing emissions. A future study to closely examine alternatives to prescribed burning is planned.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Coatings & Ink Manufacturing (S-IND-1)

(Chemical)

Source Category:
This source category includes all manufacturers of coatings and inks.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

- It is not known if the VOC emission inventory includes emissions from the manufacture of water-based coatings. The manufacture of water-based coatings is exempt from the rule requirements.
- There are no limits on the VOC content of solvents used for cleaning in the current rule – only that the cleaning procedure must be APCO-approved. It is not known whether there are solvent-cleaning VOC emissions associated with this source category. The activity associated with the cleaning portion of this source category is covered under control measure S-SOL-11.
- EICs Affected: 410-995-8400, 410-407-9000

Current Control: District Rule 4652 specifies equipment design and operational procedures for processes associated with the manufacture of coatings or inks. The rule requires that portable mixing vats be covered, and includes lid configuration requirements. Stationary mixing vats are to be covered and grinding mills must have fully enclosed screens. For cleaning portable and stationary vats, as well as for cleaning high-speed dispersion mills, grinding mills, and roller mills, APCO-approved cleaning methods are required.

Future Control Options:

- Extend portable mixing vat lid configuration requirements to stationary mixing vats.
- Require that all stationary mixing vats be under VOC emission control system.
- Include an option in the rule to allow operator to use VOC emission control system in place of equipment specifications for coating/ink manufacture or in place of solvent cleaning limitations.
- Limit VOC content and usage for solvent cleaning.

Discussion:

- Coating and ink manufacturing operations are located at stationary sources for which the District has legal authority to regulate air emissions.
- The lid configuration standard for stationary mixing vats has been adopted in other air districts. It is not clear how much in VOC emission reductions could be realized from adopting the standard into Rule 4652.

- The cost effectiveness of requiring VOC emission control systems for stationary mixing vats must be evaluated, in light of the small size of the VOC emission inventory.
- If operators are allowed flexibility in controlling VOC emissions, individuals can make the best economic decisions for their particular sources. Since this rule does not have specific VOC emission limits, determining emission reductions associated with implementing this provision is problematic.
- The removal of the water-based coating manufacture exemption is promising. The facilities that manufacture coatings and inks within the District generally manufacture water-based coatings. Further study is needed to understand if the current VOC emission inventory includes emissions from the manufacture of water-based coatings or from non-water-based coatings only.
- Limiting the VOC content of cleaning solvent may be a potential for VOC emission reductions. Further study is needed to determine how much emissions are associated with solvent cleaning for this source category and what solvents operators are currently using.
- Commentors to the plan offered the following information: Further study is needed to determine the VOC emissions reductions that can be obtained from the manufacture of coatings, inks and adhesives, especially since the total emissions are small. Since VOC levels in architectural, industrial, and maintenance products have decreased, the VOCs from manufacturing of these products have decreased as well. The exemption in the current rule for the manufacture of water-based coating is intended to provide flexibility and incentives for the manufacturer to move towards producing lower VOC products. Drastic VOC controls for water-based coatings will result in few reductions, and these measures will be costly. The District should not take this incentive away by requiring costly VOC emission control systems.

Recommendation:

- This source category is not recommended as a control measure. No appreciable additional reductions are available from this source category considering the lack of active facilities operating within the District.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Petroleum Solvent Dry Cleaning Operations (S-IND-2)

(Laundering)

Source Category:
Facilities that use solvent other than perchloroethylene to clean clothing are included in this source category.

Emissions Inventory:
With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.06	0.06	0.07	0.07	0.07	0.08	0.08	1.09

- EICs Affected: 210-200-3300; 210-200-8102; 210-200-8150

Current Control: District Rule 4672 requires the use of add-on control devices and solvent recovery dryers. Filtration wastes are limited to 1-kilogram petroleum waste solvent per 100-kilogram dry weight of articles cleaned.

Future Control Options:
- None additional control opportunities.

Discussion:
- These units are located at stationary sources for which the District has legal authority to regulate air emissions.
- The controls included in District Rule 4672 are as stringent as rules in other air districts.
- All petroleum solvent cleaning machines in use in the District are “dry-to-dry” type, meaning that “wet” articles are not transferred between a “wet” machine and a dryer, reducing the potential for fugitive emissions from items that are saturated with petroleum solvent.

Recommendation:
- This source category is not recommended as a control measure. No appreciable additional reductions are available from this source category.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Polyester Resin Operations (S-IND-3)

(Chemical)

Source Category:
This source category includes commercial and industrial polyester resin operations, and to the organic solvent cleaning, and the storage and disposal of all solvents and waste solvent materials associated with such operations. The polyester resin users typically are making composite materials, meaning mixing the resin with glass fiber to make a product. This source category covers manufacturers of boats and yachts as well as those making fiberglass shower units.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03
VOC	0.35	0.38	0.40	0.40	0.47	0.49	0.52	0.72

The emissions inventory for this source category is suspect and will be further refined.

- EICs Affected: 410-403-5018, 410-404-5016, 410-404-5028, 410-404-5030

Current Control: District Rule 4684 sets monomer content limits for resin as well as specifying application equipment and work practice standards. Except for recordkeeping requirements, operations using less than 20 gallons of polyester resin per month are exempt from the rule.

Uncontrolled VOC emissions have been controlled by about 61.5% and 66% of all possible polyester resin facilities subject to this rule. Operations that are not subject to this rule are very small, and actually use very little polyester resin.

Future Control Options:
The following control options have been identified from recent rule amendments in other air districts.

- Reduce monomer content limits for some resins.
- Add vapor suppression to rule requirements related to tub/shower open molds.
- Limit weight loss for resin systems used in closed molds. Increase overall capture and control efficiency of VOC emission control system from 85% by weight to 90% by weight.

Discussion:

- Processes that use polyester resin are located at stationary sources for which the District has legal authority to regulate air emissions.
- For the first three future control options – monomer content limits, vapor suppression, limited weight loss – operators have the option of either using compliant materials or installing and maintaining a VOC emission control system.

Polyester Resin Operations
(Continued)

Since the capital cost of a VOC emission control system can be high, District staff believes that operators would choose to use compliant materials.

- The expected emission reduction associated with the change in monomer content would depend on the average usage of each type of coating. Monomer content limits in other air districts are 2% to 20% less for certain resin categories in current Rule 4684. To be conservative, District staff assumed that VOC emissions would be reduced by 2% if new monomer content limits were implemented.
- District staff does not have technical information available at this time to determine how much VOC emission reductions would result from adding vapor suppression chemicals to resins or from limiting weight loss in closed molds. For purposes of this control measure, District staff is assuming essentially no change in VOC emissions if these control measures were implemented.
- Few facilities use VOC emission control devices to meet the current resin monomer limits of the rule, so total VOC emission reductions from this control option are assumed to be small, on the order of 1% of baseline VOC emissions. The cost effectiveness of increasing the overall capture and control efficiency of a VOC emission control system must be evaluated, in light of what appears to be minimal emission reductions.

Recommendation:

- This source category is not recommended as a control measure. No additional reductions are available from this source category.

Projected Reduction:

With recommended controls

Emission Reductions Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Rubber Tire Manufacturing (S-IND-4)

(Industrial Processes-Chemical)

Source Category:
This source category includes any facility that is involved in rubber tire and recapping treadstock manufacturing facilities.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.27	0.27	0.27	0.27	0.27	0.27	0.47	0.53
VOC* adj	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*The inventory is suspect. This source category has no active facilities. This needs to be investigated further to determine the validity of the emissions inventory.

- EICs Affected: 410-402-5062-0000

Current Control: District Rule 4681 (amended 12/16/1993) requires that the cement applicator, cement tank and tread drying conveyor shall be enclosed to capture VOC evaporation; all VOC captured shall be transported to an emission control device for removal; green tire coating hall be waterborne; an approved emission control shall be used on the bead cementing line; an approved emission control system shall be used on the tread end cementing line; containers for organic solvents and cements containing organic solvents shall be free from leaks at all times and kept covered except when in use.
Currently there are no facilities in operation in the San Joaquin Valley Air Basin that are subject to this rule.

Future Control Options:
- No future control options are necessary

Discussion:
- There are no facilities operating that are subject to this rule.
- Rule 4681 meets the requirement of EPA Control Techniques Guidelines.

Recommendation:
- District staff does not recommend pursuing this as a control measure. No additional reductions are available from this source category since there are not facilities in the District.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Asphalt Roofing (S-IND-5)

(Asphalt Paving/Roofing)

Source Category:
The operators who make up this category are roofing contractors who apply asphalt roof coatings (bitumin-containing roofing compounds) to commercial and industrial buildings.

Emissions Inventory:
With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.69	0.69	0.70	0.70	0.71	0.71	0.72	0.98

- EICs Affected: 540-590-0400

Current Control: District Rule 4601 (Architectural Coatings) limits VOC content of bituminous roof coatings.

Future Control Options:
- Reduce VOC content limit for bituminous roof coatings to match limits in other air district.
- Limit temperature in heating vessels for bituminous roof coating.

Discussion:
- This is a source category for which the District has legal authority to regulate air emissions.
- The VOC content limits for bituminous roof coatings falls under District Rule 4601 (Architectural Coatings). Another air district has amended its rule corresponding to District Rule 4601 to impose a lower VOC content limit for this coating type.
- The emission inventory cited above is for asphalt roofing operations, which would more precisely be those emissions that occur during application of the material. Other air districts have source-specific rules that limit the temperature in the heating tank prior to application of the asphalt roof coating. The temperature imposed on the coating in the heating vessel is high enough so that the coating is at a workable viscosity, but not so high as to emit unnecessary VOCs. By placing a limit on the maximum temperature, operators could still continue to use this cost-effective coating, but VOC emissions during coating application are limited, possibly less than 1% reduction. District staff is recommending that this control option be explored as part of a rule development project.
- A brief discussion with an inspector in another air district indicates that there are coatings that meet the lower VOC content limit currently in use and that a temperature limit is placed on application of roof coatings, if the heating vessel is of a certain size. Based on this, District staff recommends that the proposed future control options could be implemented either as revisions to District Rule 4601 or as a separate new rule specific for roof coatings.

Asphalt Roofing
(Continued)

Recommendation:

- District staff recommends that this source category be controlled through rule development with full implementation by 2012.
- Based on the current emissions inventory or lack thereof, control level, and existing technology, emission reductions are not quantifiable for this source category. However a future study to re-evaluate this source category is planned.

Projected Reductions:

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Polystyrene Foam, Polyethylene, and Polypropylene (S-IND-6)

(Chemical)

Source Category:
This source category includes the manufacturing of consumer foam products such as coffee cups, food containers and packing material. There are ten manufacturers of these foam products located within the District.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	0.128	0.143	0.154	0.157	0.165	0.175	0.185	0.194
VOC	0.32	0.35	0.37	0.39	0.43	0.46	0.49	1.39

- EICs Affected: 410-404-5034-0000; 410-404-5036-0000; 410-404-5038-0000; 410-404-5044-0000; 410-404-5046-0000

Current Control: District Rule 4682 requires the use of non-VOC blowing agents or a VOC emission control system consisting of a thermal oxidizer with at least 95% control efficiency and collection device(s) with 90% capture efficiency. VOC-containing blowing agent may be stored in a pressure vessel preventing VOC release or within a VOC emission control system with at least 95% by weight control efficiency.

Future Control Options:

- Lower VOC limits and control emissions from storage in-process materials and warehousing of finished product.

Discussion:

- This rule would be expanded to include VOC emission reduction or control from product curing areas and general product storage, similar to those employed by some existing sources.
- Possible controls for this category include switching to an alternative, non-VOC blowing agent or employing capture and control systems for the VOC emissions. All ten manufacturers within the District are still using VOC-containing blowing agents, either directly or in the form of beads.
- A scoping meeting to present the objectives of the rule development project was held in July 2006. The first public workshop with draft rule language is anticipated in October 2006.
- Adoption of Rule 4682 amendments is expected for the third quarter of 2007, and implementation likely in the fourth quarter in 2009.
- Upon full implementation, it is estimated that less than 0.1 tons per day of VOC emission reductions would be realized.

Polystyrene Foam, Polyethylene, and Polypropylene
(Continued)

Recommendation:

- The first workshop for this rule project is tentatively scheduled for October 2006. The public hearing to consider adopting the rule changes is expected in the third quarter of 2007.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VOC	0.0	0.00	0.10	0.10	0.11	0.12	0.35

Mastic Removers (S-IND-7)

(Other – Cleaning & Surface Coating)

Source Category:
This source category includes operations that use mastic (also called mastic texture) which is a pasty material that can be used as an adhesive for tiles. In older buildings, mastic can contain asbestos. Mastic remover is a solvent that is used to remove mastic. The affected sources are building construction/renovation contractors as well as mastic remover manufacturing companies.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ

- The emission inventory for this source category is not known. A survey of schools, "Big Box" retailers, renovation contractors, and mastic remover manufacturers would be needed to determine the size and scope of this emission inventory category.

- EICs Affected: 510-506-6515

Current Control: Prior to December 31, 2006, California Air Resources Board (ARB) did not specifically regulate adhesive removers for floor and wall coverings, of which mastic remover is a specific type. On and after December 31, 2006, ARB will limit the VOC content limit of adhesive removers for floor and wall coverings to 5% VOC by weight. This corresponds to an equivalent VOC content of 0.42 pounds per gallon or 50 grams per liter. By contrast, a typical mastic remover currently available has 6.7 pounds VOC per gallon or about 800 grams per liter. ARB Consumer Products Regulation applies to products sold at retailers like Home Depot and Lowe's as well as products sold by distributors in containers 55 gallons or less.

Future Control Options:
- None known at this time.

Discussion:
- Mastic remover is primarily used to help remove floor tile in older school buildings. This occurs during the summer break, namely June through September, which is also the peak ozone season.
- Some mastic remover is used is to remove the floor tiles from "Big Box" warehouses. The quantity of mastic remover used for this application is expected to be small compared to the amount used in school tile removals, however, the number of renovations may make this sub-category significant.

Mastic Removers
(Continued)

- In place of solvent-based mastic remover, operators can use mechanical means using a "bead-blaster/vacuum" system to remove tiles. This method is used when no asbestos is suspected in the mastic. The bead-blaster/vacuum produces the best overall results for preparing the surface for reapplication of adhesive and tiles. If there is no asbestos in the mastic, this type of operation is the most cost effective method to remove the mastic. This process does not use solvent, and is a purely mechanical/abrasive process. No VOC is lost to the atmosphere.
- The bead blaster method is not used if there is asbestos in the mastic. By federal and state regulation, the asbestos material must be kept wet during removal. A bead-blaster/vacuum system cannot be used in this instance since the wet material, containing mastic and mastic remover, can clog the vacuum. Instead, operators can use mechanical means using mastic remover "solvent" and a "buffer/scraper." For VOC control of asbestos-laden air, a carbon canister could be added on the venting hose. This would be in addition to the particle filter used to capture asbestos dust.
- VOC reductions are expected to be about 93% of baseline at full implementation of the ARB regulation. Full implementation would be no later than January 2009.
- Since ARB regulates this source category, no further work is suggested for this source category.

Recommendation:

- District staff recommends that no further work be done for this source category since it will be regulated by ARB as a consumer product starting December 31, 2006.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NA	NA	NA	NA	NA	NA	NA

Vegetable Oil Processing Operations (S-IND-11)

(Food & Agriculture)

Source Category:
This source category includes facilities that extract oil from vegetable sources like cottonseeds and corn.

Emissions Inventory:
With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.36	0.37	0.40	0.40	0.44	0.46	0.48	0.48

- EICs Affected: 420-420-6030

Current Control:
- Extractors, Desolventizer/Toasters must not emit more than 15 lbs per day of VOC, unless equipment is installed that ensures 90% overall capture and control efficiency.
- Operators must check for fugitive VOC emissions (leaks) on a monthly basis.
- Incineration devices, used to comply with rule requirements are exempt from BACT and offset requirements of Rule 2201 (New and Modified Source Review Rule).

Future Control Options:
- Increase overall capture and control efficiency.
- Change leak definition from 10,000 ppmv to 1,000 to match other District rules.

Discussion:
- Vegetable oil processing takes place at stationary sources for which the District has legal authority to regulate air emissions.
- Rule 4691 encompasses the most stringent VOC emission limits for this source category.
- For other rule projects, EPA has voiced concern over exemptions from BACT and offset requirements in any rule other than a new source review (NSR) rule, meaning that District Rule 2201 should be the only place where the BACT and offset requirements are detailed. This rule should be revised to remove automatic exemption from BACT and offset requirements. The revision will have no effect on current facilities and sources may still be exempt from BACT and/or offset requirements if the modification meets provisions in District Rule 2201.
- Since the operator must check for leaks on a monthly basis, a change in leak definition is not expected to yield any significant emission reductions.

Vegetable Oil Processing Operations
(Continued)

Recommendation:

- District staff does not recommend pursuing this as a control measure.
- District staff recommends that the rule be modified to remove the automatic exemption from BACT and offset requirements. No emission reductions are expected for this change.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Wine Fermentation and Storage Tanks (S-IND-12)

(Food & Agriculture)

Source Category:
This source category includes all tanks used for the fermentation or storage of wine.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	3.6	3.7	3.8	3.8	3.9	4.0	4.1	4.1

- EICs Affected: None are listed at this time.

Current Control: District Rule 4694 requires facilities to reduce the VOC emissions from fermentation by 35%; installation and maintenance of a pressure vacuum relief valve; wine stored at or below 75 degrees Fahrenheit. The rule exempts storage tanks constructed primarily of concrete or wood and wineries that emit less than 10 tons of VOC per year.

Future Control Options:
- Increase the current required annual emissions reduction from 35% to over 50%. This would reduce emissions by approximately 15%.
- Remove the alternative compliance provision and require operators to place controls with 86% VOC capture and control efficiency on fermentation tanks.

Discussion:
- For wine storage tanks in major source facilities, Rule 4694 established RACT as the use of pressure-vacuum relief valves.
- The RACT analysis for this source category can be found in Appendix K of this plan.
- There are significant technical uncertainties and high costs associated with increasing the required emission reduction above 35%. This would require facilities to install additional controls or purchase additional surplus reductions, which could cost in excess of $100,000 per ton of VOC reduced per year.
- Removal of the exemption for wood and concrete fermenters would achieve reductions of 0.8%. The cost of the retrofit or emissions purchases for these facilities would be similar to the costs for facilities currently subject to rule requirements.

Recommendation:
- The recent adoption of this rule has maximized the possible emission reductions from this source category. Future equipment advancements may produce additional reductions. A future study to re-evaluate this source category is planned.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Bakery Ovens (S-IND-13)

(Food & Agriculture)

Source Category:
This source category includes all bakery ovens that are used for the baking of yeast leavened products.

Emissions Inventory:
with current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.52	0.54	0.56	0.57	0.61	0.63	0.66	0.66

- EICs Affected: 420-412-6012; 420-412-6037

Current Control: District Rule 4693 requires an emission collection system with a control efficiency of at least 95%.

Future Control Options:
- Increase the control efficiency requirement to 97%. This is expected to reduce emissions by approximately 2%.
- Expand the applicability to sources with VOC emissions less than 25 tons per year. This would affect approximately 25% of the VOC emissions from this source. Therefore, it is expected to reduce VOC emissions by 24% (95% reduction x 25% VOC emissions = 24%).

Discussion:
- Based on District source test data, some bakeries subject to Rule 4693 are achieving VOC control efficiencies of greater than 95%. This requirement would likely require retrofits or rebuilds of existing equipment at facilities not already achieving VOC control efficiencies greater than 95%.
- There are sources with VOC emissions below 25 tons per year that use catalytic thermal oxidizer to achieve VOC control efficiencies of greater than 95%.

Recommendation:
- The current rule has maximized the possible emission reductions from the affected units in this source category. Future equipment advancements may produce additional reductions from exempt equipment. A future study to re-evaluate this source category is planned.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Aging of Brandy and Wine (S-IND-14)

(Food and Agriculture)

Source Category:
This source category includes operations in the production of brandy to include distillation, aging and bottling.

Emissions Inventory:
With current controls and regulations: does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	6.42	6.60	6.80	6.86	7.00	7.21	7.43	7.67
VOC adjusted *	6.42	2.10	2.30	2.30	2.50	2.70	2.90	3.10

***** The adjusted VOC takes into account the reductions from facilities that are part of alternative compliance options, totaling 4.5 tons per day, which are SIP creditable to previous 1-Hour Ozone Plan commitments.

- EIC Affected: 420-410-6090

- There are conflicting emission inventory estimates for brandy and wine aging: District survey data shows 719 tons per year in 2004, and a consultant estimates 7,196 tons per year based on Alcohol, Tobacco, and Trade data.
- The discrepancies are due to differences in the production amounts and the emission factors.
- These discrepancies will be resolved as a more thorough and effective survey of facilities and their production figures is completed and as issues regarding interpretation of emission factors are resolved.

Current Control:
- There are no current rule-based requirements for controlling VOC emissions from the aging of brandy and wine.
- In lieu of installing VOC control devices for wine fermentation to fulfill District Rule 4694 (Wine Fermentation and Storage Tanks) requirements, operators are controlling surplus emissions from the brandy production source category to obtain equivalent reductions which are creditable to the wine fermentation rule. It is expected that all SJV brandy facilities will be controlled to the maximum extent currently feasible.

Future Control Options:
- Vent the off-gasses to a VOC destruction device, such as a biofilter, or, for facilities with boilers, route the VOCs to the burners for destruction.

Discussion:
- The RACT analysis for this source category is included in Appendix K of this plan.

Aging of Brandy and Wine
(Continued)

- Major sources of VOC from the aging of brandy and wine are being controlled at RACT levels and beyond through an alternative compliance option in District Rule 4694 (Wine Fermentation and Storage Tanks).
- Brandy production facilities that have applied for permits to install VOC control devices ~~and~~ have chosen regenerative thermal oxidizers, which are cost effective if the VOC emissions throughput is large enough.
- Other smaller facilities could be controlled for VOCs with biofilters, which are cheaper to install and operate, yet can still yield approximately 80% VOC reduction from some of the facilities if technology can be proven to apply to the source without affecting product quality and stability.

Recommendation:

- Control VOCs from brandy and wine aging through alternative compliance options available to facilities applicable to Rule 4694.
- Assure that the permitting process for facilities using the alternative compliance option meet all criteria for taking SIP credits for the emission reductions.
- This source is considered to be controlled to the maximum level possible with known controls through the alternative compliance option.
- Explore the viability of alternative control technologies, such as biofilters, for the control of VOCs in facilities which are too small to use regenerative thermal oxidizers. If necessary, use incentives for demonstration projects.
- A new rule will be developed as a backstop measure to codify control requirements.

Projected Reductions:

With recommended controls

Emissions Reduction, Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Flares (S-IND-21)

(Oil & Gas Production – Combustion, Sewage Treatment, Landfills, Incinerators, Oil & Gas Production, Petroleum Refining)

Source Category:
This source category includes any operation involving the use of flares.

Emissions Inventory:
With current controls and regulations: does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	0.070	0.082	0.083	0.083	0.084	0.091	0.093	0.090
VOC	0.045	0.049	0.050	0.050	0.051	0.053	0.054	0.055

- EICs Affected: 110-132-0130; 120-132-0136; 130-132-0136; 310-320-0110; 310-320-0120; 310-320-0130

- The current emissions inventory will be validated if it accounts for the emissions generated during emergency flaring events. Current NOx emissions appears to be low and may have only accounted for the emissions generated by the gas fuel used to keep the flare pilot flame on at all times.
- Usage records will be used to determine the total amount of gases sent to the flare during normal operation and process equipment upset or breakdown periods. Thereafter, the emissions will be calculated and the emissions inventory will be updated.

Current Control:
- Operations involving the use of flares are subject to District Rule 4311.
- District Rule 4311 specifies requirements for the following: pilot flame devices, automatic ignition systems, heat-sensing devices, use of purge gases, applicable provisions of 40CFR60.18, and emission standards for ground-level enclosed flares.

Future Control Options:
- Flare Minimization Plan (FMP), including strategies, such as: (1) Installing vapor recovery systems, (2) Increasing the vapor recovery system capacity, (3) Increasing the fuel gas treating capacity, (4) Implementing routine inspection and monitoring to detect leaking valves, (5) More rigorous monitoring and reporting requirements, and (6) Improving operational and maintenance procedures to more effectively prevent upset conditions.
- Continuous monitoring of the pressure and height within the water seal.

Discussion:
- The experience of BAAQMD and SCAQMD in incorporating FMPs have resulted in data being gathered, which can be used to evaluate the effectiveness of FMPs in reducing flaring events.

Flares
(Continued)

- The provisions in the South Coast rule regarding explicit prohibition of flaring in some instances and a reporting requirement for flare emissions that spread over 100,000 cubic feet will have to be evaluated, as to its efficacy in reducing flaring.
- During the last amendment of Rule 4311, an FMP was deemed as unproven in its ability to provide reductions, which was apparent since other districts that incorporated these were unable to state the expected emission potential of this strategy.

Recommendation:

- Evaluate the effect of FMPs and other provisions that other district rules have implemented.
- If found appropriate and applicable, amend District Rule 4311 to incorporate requirements that will result in reduced flaring events.

Projected Reductions:

With recommended controls

Emissions Reduction, Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	0	0	0	0	0	0	0
VOC	0	0	0	0	0	0	0

Incinerator Burning (S-IND-22)

(Incinerators)

Source Category:
This source category includes facilities operating certain types of ovens called "burn-out ovens" as well as crematoriums and other units traditionally associated with incinerators.

Emissions Inventory:
With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- EICs Affected: 130-130-0110, 130-130-0266

Current Control: District Rule 4302 requires the use of multiple-chamber incinerator or APCO-approved equipment that is equally effective for the purpose of air pollution control.

Future Control Options:
- None

Discussion:
- These units are located at stationary sources for which the District has legal authority to regulate air emissions.
- This source category has a very small NOx and VOC emissions inventory. Even if advanced emission control technology were available, it is doubtful whether it would be cost effective, since emission reductions would be minimal.
- This rule could be improved through administrative change to clarify provisions for controlled burning facilities.

Recommendation:
- This source category is not recommended as a control measure. No additional reductions are available from this source category.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Reduction Of Animal Matter (S-IND-23)

(Other Miscellaneous Processes)

Source Category:

This source category includes facilities engaged in the reduction of animal matter. Reduction is defined as any heated process, including rendering, cooking, drying, dehydration, digesting, evaporating, and protein concentrating.

Emissions Inventory:

With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ

The inventory for this source category appears as zero, which reflects the activity of five facilities that are controlled at very stringent levels. However, it may not reflect all the applicable equipment used in rendering facilities, which may be accounted for in other source categories, such as fuel combustion. Additional analysis is needed to accurately account for emissions from this source category.

- EICs Affected: 699-995-0000

Current Control:

- District Rule 4104 requires incineration at 1200° F for a minimum of 0.3 seconds.
- District Rule 2201 (New and Modified Stationary Source Review Rule or NSR) mandates permit conditions on the five facilities that are also subject to Rule 4104 requirements.

Future Control Options:

- None. Development and implementation of Best Available Control Technology (BACT) is always an option, as these become available.

Discussion:

- The required incineration conditions are similar to other district requirements.
- Permit conditions require thermal oxidizers, scrubber condensers, and packed-bed odor scrubbers, all of which reflect use of the most effective pollution control technologies, as a result of NSR guidelines that involve BACT assessments.

Recommendation:

- This source category is not recommended as a control measure. No additional reductions are currently projected from this source category.
- Based on the current emissions inventory or lack thereof, control level, and existing technology, emission reductions are not quantifiable for this source category. However a future study to re-evaluate this source category is planned.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

VOC Emissions from Decontamination of Soil (S-IND-24)

(Soil Remediation, Petroleum Marketing)

Source Category:
This source category includes all activities involving the remediation of contaminated soils. Soil contamination from organic material occurs due to leaking storage and handling systems, operating losses, and accidental spills.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.11	0.11	0.12	0.12	0.14	0.14	0.15	0.75

- EICs Affected: 140-995-0010; 140-995-0240; 330-995-0010

Current Control: District Rule 4651 requires management practices for excavation; sets limits on aeration; and requires VOC collection and control systems for treatment of contaminated soil.

Control Options:
- Eliminate allowances for aeration and increase the overall capture and control efficiency requirements for VOC collection and control systems.

Discussion:
- Soil remediation projects are short-lived. Over 99% of the projects are subject to District best available control technology (BACT) requirements, which is more stringent than any existing air district regulation. Therefore, despite the fact other air districts have more stringent rules, no reductions are achievable.
- A rule development project is being concluded to amend Rule 4651 to ensure it is as stringent as other district rules in order to minimize reliance on BACT. No reductions are expected from this project.

Recommendation:
- Not recommended as a control measure, no additional reductions are available from this source category but a rulemaking will be completed to satisfy the one hour ozone plan commitment.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plants and Organic Liquid Loading (S-PET-1)

(Petroleum Marketing, Chemical)

Source Category:
This source category includes the transfer of gasoline between delivery vessels and storage containers and loading racks that are used to load organic liquids with a TVP of 1.5 psia or greater.

Emissions Inventory:
Does not reflect reductions from proposed controls

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	0.019	0.021	0.023	0.023	0.024	0.027	0.028	0.03
VOC	3.4	3.6	3.7	3.8	4.1	4.2	4.4	4.5

The emissions inventory does not account for emissions of VOC or NOx from mobile fuelers.

- EICs Affected: 330-382-1100, 330-382-1110, 330-382-1120, 330-382-1130, 330-384-1100, 330-384-1120, 330-384-1130, 330-374-1100, 330-376-1100, 330-390-0010, 330-390-1100, 330-390-1200, 330-392-1100, 330-395-1100, 330-396-1100, 330-397-1100

Current Control: District Rule 4621 requires permanent submerged fill pipe & ARB certified Phase I vapor recovery system; pressure relief valve; delivery vessel requirements. Rule 4624 sets allowable VOC emission limits based on loading rack throughput.

Future Control Options:
District Rules 4621 and 4624 are control measures under the Extreme Ozone Attainment Demonstration Plan and are a current rule development project. No further control options are available.

Discussion:
Rule 4621 is currently undergoing rule development process along with Rule 4624 as part of the Extreme Ozone Attainment Demonstration Plan control measures. Possible amendments to Rules 4621 and 4624 include:

- Removal of exemptions
- Increase inspection frequency
- ARB recently required certified Phase I systems to achieve 98 percent control efficiency. Change Rule 4621 language to require this increased efficiency.
- Widen applicability to include mobile fuelers and require that they have ARB certified vapor recovery. Other districts have incorporated this requirement into their equivalent rules.
- Reduce allowable limit of vapor leak from
- Expand applicability to include a third loading category.

Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plants and Organic Liquid Loading (Continued)

Adoption for this control measure is expected in the fourth quarter of 2007 with implementation of VOC control in 2010. Upon final implementation of this measure, with the related S-PET-2 control measure, 2010 reductions are estimated to achieve at least 0.9 tons per day.

Recommendation:

- Continue current rule development and adopt proposed amendments to Rule 4621 in the fourth quarter of 2007.
- Currently this source category is not a candidate for incentive funding, but further analysis and study is necessary to determine if this source category may garner cost effective reductions in the future provided funding sources are available. Please see Chapter 7 for any additional information.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VOC	0.0	0.90	0.92	0.99	1.03	1.07	1.08

No NOx reductions are expected Rule 4621 is a VOC rule and does not address NOx.

Gasoline Transfer into Motor Vehicle Fuel Tanks (S-PET-2)

(Petroleum Marketing, Other – Petroleum Production and Marketing)

Source Category:
This source category applies to all locations storing and dispensing gasoline into motor vehicle fuel tanks.

Emissions Inventory:
Does not reflect reductions from proposed controls

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	2.7	2.8	2.9	3.0	3.3	3.4	3.6	3.6

The emission inventory does not take into account emissions from mobile fuelers.

- EICs Affected: 330-374-1100, 330-376-1100, 330-378-1100, 330-378-1210, 330-380-1100

Current Control: District Rule 4622 currently requires an ARB certified Phase II vapor recovery system, a periodic self-maintenance inspection program based on facility throughput, and period inspections and repairs within a certain time frame.

This rule currently exempts facilities that are exempt from the vapor recovery requirements of Rule 4621 and facilities with a throughput of less than 24,000 gallons per calendar year or 10,000 gallons or less per consecutive 30-day period.

Control Options:
District Rule 4622 is a rule development project that is currently under development by district staff.

Discussion:

Rule 4622 is currently part of the rule development process with possible amendments including:

- Improved effectiveness of compliance with ARB vapor recovery testing and certification standards.
- Expand controls to include mobile fuelers as other districts have done.
- Require self-maintenance frequency for vapor path to match frequency for other self-maintenance items.
- Increase inspection frequency for vapor leaks.
- Lower the allowable vapor leak threshold.
- Require mandatory replacement of breakaways once they have been engaged.

Adoption of this control measure is expected for 2007 with implementation of VOC controls by 2010. Upon final implementation of this measure, with the related S-PET-1 control measure, 2010 reductions are estimated to achieve at least 0.9 tons per day.

Gasoline Transfer into Motor Vehicle Fuel Tanks
(Continued)

Recommendation:

Continue current rule development and adopt proposed amendments to Rule 4622 by fourth quarter 2007. Please see S-PET-1 for the corresponding emission reduction estimates.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Aviation Fuel Transfer (S-PET-3)

(Other - Petroleum Production and Marketing)

Source Category:
This measure would affect operations with bulk aviation fuel storage, including military, civilian, and private airports or air fleet services. These tanks typically hold either aviation gasoline or a variety of kerosene-based jet fuel. There are 43 airports in the SJVAB that sell one or both types of these fuels.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20

ARB emission inventory does not include an emission category for aviation fuel for the SJVAB. Sonoma Technology, Inc. (STI), an outside consultant, has done work that will be used to update this source category.

- EICs Affected: 330-321-1000-0000; 330-321-1410; 330-322-1410; 330-322-1420; 330-326-1410; 330-326-1420; 330-328-1410; 330-330-1140; 330-330-1410; 330-392-1400

Current Control: There is no current District rule that covers this source category. District Rule 4621 (Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plant) addresses Phase 1 requirements for tanks holding motor vehicle fuel, but not aviation fuel. Phase 1 operations at facilities using aviation fuel include filling aviation fuel bulk storage tanks using primary fuel delivery trucks as well as the filling of airport fuel delivery trucks from the bulk storage tanks. It does not include filling an aircraft's on-board fuel tanks. While District Rule 4622 (Gasoline Transfer into Motor Vehicle Fuel Tanks) addresses fueling motor vehicles, it does not apply to fueling aircraft since aircraft do not have uniform fueling points and the Phase 2 equipment for gasoline is not certified for aviation fuel use.

Future Control Options:

- Fugitive emissions can be controlled with pressure-vacuum relief valves on storage tanks, submerged fill tubes to reduce splashing, and vapor recovery or destruction systems similar to those used for Phase I motor vehicle fueling operations.
- VOC reduction equipment may be feasible for aviation fuel storage vessels.

Discussion:

- This category is a Post-2003 Control Measure in the *Ozone ROP Plan*.
- Fugitive VOC emissions are released from these tanks due to spillage and vapor displacement during Phase 1 operations and from venting through relief valves to prevent excessive pressure from diurnal heating. The new rule would reduce fugitive VOC emissions created during Phase 1 aircraft refueling operations.

Aviation Fuel Transfer
(Continued)

Recommendation:

- Adoption for this control measure is anticipated in the fourth quarter of 2007 with implementation projected for the year 2010.

- Based on previous emission inventory information from the One-hour Ozone Attainment Plan, the emissions from sources affected by the control measure are estimated at 0.2 tons VOC per day in 2008. Upon final implementation of the proposed control measure, a reduction of less than 0.05 tons of VOC per day is anticipated.

- Further refinement of the emission inventory is needed to incorporate recent findings of STI, Inc, as appropriate.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.05	0.05	0.05	0.05	0.05	0.05

Steam Enhanced Crude Oil Production Well Vents (S-PET-11)

(Oil & Gas Production)

Source Category:
This source category includes all steam enhance crude oil production well vents and associated vapor control or collection equipment.

Emissions Inventory:
With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	13.5	13.2	12.6	12.5	11.7	11.3	11.0	12.1

- EICs Affected: 310-342-1600; 310-344-1600

Current Control: District Rule 4401 requires total uncontrolled VOC to be reduced by 99%; set maximum time limits for leak repair; and sets limits on the number of allowable leaks.

Future Control Options:
- Reduce the leak threshold from 10,000 ppm to 1,000 ppm and the number of allowable leaks to achieve VOC emission reductions of approximately 1.16 tons per day.
- Reduce the time period for facilities to repair to achieve VOC emission reductions of at least 0.001 tons per day.

Discussion:
- District staff does not believe that facilities could control VOC emissions by more than 99%.
- The control options discussed above have been achieved at facilities, and are included in the proposed amendments to Rule 4401. The proposed amendments to Rule 4401 are scheduled for adoption hearing on December 14, 2006.
- ~~A~~dopt the currently proposed amendments to Rule 4401 that incorporates all of the control options by December 14, 2006.

Recommendation:
- This is not a recommended control measure as it was recently adopted in December 2006. Please see the recently adopted rules and the associated emission reductions in Appendix B of this plan.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Components Used in Oil/Gas Production & Processing (S-PET-12)

(Oil & Gas Production)

Source Category:

This source category pertains to components carrying VOC-containing fluids that are used in crude oil production, natural gas production, and natural gas processing facilities. Components are devices such as flanges, connectors, valves, pumps, compressors, well head polished stuffing boxes, pressure relief devices (PRDs), etc.

Emissions Inventory:

With current controls and regulations: does not reflect reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05
VOC	5.0	4.9	4.8	4.7	4.5	4.3	4.3	11.6
VOC* adj	9.943	3.94	3.80	3.76	3.68	3.57	3.47	3.40

* Emissions inventory does not reflect reductions resulting from recently adopted Rule 4409. This adjustment to the baseline inventory accounts for the 60% reduction from previously controlled emissions level resulting from Rule 4409 implementation effective April 2006.

- EICs Affected: 310-302-0110; 310-302-1600; 310-304-1600; 310-306-1600; 310-308-1600; 310-308-0110; 310-310-0110; 310-310-1600; 310-316-1600; 310-352-0100

Current Control:

- Previous Rule 4403 regulates VOC emissions from components used in crude oil production, natural gas production, and natural gas processing facilities. Rule 4403 has been superseded by more stringent leak detection and repair (LDAR) requirements of recently adopted Rule 4409 effective April 2006.
- Leak thresholds: Major gas leak: >10,000 ppmv
  Minor gas leak: 200 – 10,000 ppmv (depending on component type and whether components are in liquid or gas service). Major liquid leak: visible mist or continuous flow. Minor liquid leak: not a major liquid leak and >3 drops/minute.
- Major provisions of the rule:
  - Daily audio-visual inspections of accessible pumps, compressors, and PRDs located in manned facilities, and weekly for such components located in unmanned facilities.
  - Physical identification (affixing tag or label) of major components and critical components to facilitate inspection and repair of leaks.
  - Quarterly inspection of components using a portable hydrocarbon analyzer to detect leaks, except for inaccessible components and pipes which must be inspected annually. Critical components and unsafe-to-monitor must be inspected during each process equipment turnaround period.
    Minimizing leaks to the maximum extent possible within 1 hr of leak detection, and then repairing them within 2 to 7 days, depending on the leak concentration level (i.e., larger leaks must be repaired within a shorter period than allowed for smaller leaks).
  - Re-inspection of components within 15 days after being repaired or replaced.

Components Used in Oil/Gas Production & Processing
(Continued)

- Frequently leaking components must be replaced with BACT type equipment, vent the components to a closed vent system, remove components from operation.
- Limit on allowable number of leaking components, and includes provisions on conditions that constitute a violation of rule.
- Initial inspection within 24 hours and re-inspection within 15 days after the date of each PRD that releases into the atmosphere.
- Maintaining records of inspection results and leak repair action taken.
- Submission of a comprehensive and detailed Operator Management Plan, including information on the number of components and location, inspection schedule, leak detection training, etc.

Future Control Options:

- Rule 4409 implements the most stringent requirements that are technologically feasible.

Discussion:

- These sources are located at stationary sources for which the District has legal authority to regulate air emissions.
- Rule 4409 implements BARCT and All Feasible Control Measure and establishes the most effective LDAR standards to date.
- The rule is effective in 2006 and is expected to achieve 60% (approximately 6 tons/day) reduction from calculated emissions of 10 tons per day of VOC from this source category.
- The rule currently exempts components serving light oil wells and natural gas wells with streams containing less than 10% VOC. Further study is needed to characterize production wells between 1% and 10% VOC content.
- The rule currently defines light oil as greater than 30 API gravity. Within the industry, oil that is 20 API gravity or more is considered light oil. Further study is needed to classify the number of wells and the baseline emissions for the wells with API gravity between 20 and 30.

Recommendation:

- Rule 4409 implements the most stringent requirements that are technologically and economically feasible. Further study is needed to determine if changing the exemptions could bring in new sources, what baseline inventory is associated with the new sources and how much in emission reductions could be expected by instituting a stringent LDAR program.
- This source category is not recommended as a control measure. No additional reductions are available from this source category.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Crude Oil Production Sumps (S-PET-13)

(Oil & Gas Production)

Emissions Inventory:

With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.42	0.41	0.40	0.39	0.37	0.36	0.35	0.39

- Based on District consultant's emission inventory reports on sumps operating within the District, the VOC emissions are about 3 tons/day. Another District consultant estimated the VOC emissions of about 60 tons/day. The difference between the two estimated emission levels is due to the uncertainty in the total number of active sumps and respective surface areas.
    - A survey will be conducted to verify the inventory.

- EIC Affected: 310-300-1600

Current Control:

- Current District Rule 4402 is as stringent as other air districts for similar source category.
- Rule 4402 requires sumps to have a flexible floating cover, rigid floating cover, or fixed roof cover. The flexible floating cover has to be equipped between the sump wall and the cover edge, and the gap between the wall and at every point around the perimeter must not exceed 1 inch. The fixed-roof cover must have a PV and meet certain specific requirements.
- If sumps are replaced with above-ground fixed roof tanks, the tanks must comply with the provisions of Rule 4623.
- Exemptions include certain sumps of small producers and those located at petroleum refineries.

Future Control Options:

- Replace sumps with fixed roof tanks equipped with a VOC control device that has a control efficiency of 99%. Replacing sumps with controlled fixed roof tank could achieve about 80% reduction from current controlled level.
- Retrofit existing rigid or flexible cover of sumps with a closure device similar to the dual-seal system (primary seal and secondary seal) used on external floating roof tanks roofs with design specifications and gap thresholds similar to Rule 4623. The control efficiency of dual-seal system with minimal seal gap requirements could achieve about 90% reduction in emissions.
- Instead of a floating cover, a vapor tight fixed roof or dome cover over the sump could be installed and the collected vapors would be sent to a VOC control system. The VOC emission reduction efficiency associated with these types of cover is at least 90 percent according to information published in California Air Resources Board document "Suggested Control Measure for the Control of Organic Compound Emissions from Sumps Used in Oil Production Operations".

Crude Oil Production Sumps
(Continued)

Discussion:

- This is a source category for which the District has legal authority to regulate air emissions.
- Best control option is to replace sumps with fixed roof tanks equipped with a VOC control device that has control efficiency of 99%. A reduction of about 80% from current controlled emissions level could be achieved by this control option. Another option to reduce emissions is to retrofit existing rigid or flexible cover of sumps with a dual-seal system closure device. This retrofit method costs less than replacing sumps with controlled fixed roof tanks, and it could achieve about 10% reduction from current controlled emission level. The cost effectiveness of the two options must be determined and compared to each other. The viability of the control options should be the subject of a socioeconomic analysis.
- Evaluate appropriateness of existing exemptions and determine likely emissions reduction that could be achieved by removal of some exemptions and associated cost effectiveness and economic impacts.
- The control options discussed above would need longer implementation schedule. Staff recommends implementation of this control measure by 2012.

Recommendation:

- Based on the current emissions inventory or lack thereof, control level, and existing technology, emission reductions are not quantifiable for this source category. However a future study to re-evaluate this source category is planned.

Projected Reductions:

With recommended replacement of sumps with controlled fixed roof tanks

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Crude Oil Production Wells Using In-Situ Combustion (S-PET-14)

(Oil & Gas Production)

Emissions Inventory:

With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

- ARB emissions inventory database does not currently account the emissions from in-situ-combustion crude oil production wells and associated fugitive VOC emissions from component leaks.
- Currently, there are no permitted in-situ combustion wells operating in the District. A review of the most recent August 2006 DOGGR crude oil wells database showed there were only 28 in-situ-combustion wells in the District but they were all shut-in. Wells that are shut-in do not emit air pollutants, therefore, there are no emissions from this source category

- **EIC Affected:** 310-436-1600

Current Control:

- District Rule 4407 requires emissions from in-situ combustion crude oil production wells be controlled with a VOC control device that achieves a control efficiency of 85%, or by using a fuel burning equipment or a flare.
- Current rule achieves 85% control from uncontrolled emission level through the use of VOC control device.
- The leak detection and repair (LDAR) provisions for components requires quarterly inspection, a VOC leak standard of 10,000 ppmv, 15 days to repair leaking components, and an allowable leak of no more than two percent of the total number of components per quarterly inspection period.
- Exempts in-situ combustion crude oil production wells that are not producing or undergoing repair and maintenance.

Future Control Options:

- Best control option is to use of a VOC collection and control system consisting of a closed system with high capture efficiency and a control device that reduces or destroys the captured VOC at high control efficiency.
- The captured VOC emissions could be incinerated by using a regenerative thermal oxidizer, used as fuel for available continuously operating combustion device such as a boiler, a steam generator or a flare, send to a field gas gathering pipeline to a gas processing plant, or injected into a DOGGR approved injection well.
- Upgrade the existing LDAR to the degree similar to Rule 4409 provisions by lowering the current leak threshold of 10,000 ppmv, instituting leak minimization requirements, shortening the time frame to repair leaking components, and submission of Operator Management Plan.

Crude Oil Production Wells Using In-Situ Combustion
(Continued)

Discussion:

- There are no in-situ combustion wells currently operating in the District. Therefore, the emission from this source category is zero.
- In the event new in-situ combustion wells are placed into operation in the District, these wells would require operating permits, and would be subject to BACT and offset requirements of Rule 2201 (New and Modified Stationary Source Rule. BACT would require control of VOC emissions from the wells by at least 99 percent. In other words, VOC reductions from new wells are achieved through the District permitting process by requiring BACT and offset.
- The District has the legal authority to regulate this source category. Other air districts that have crude oil production fields currently do not have an equivalent prohibitory rule as Rule 4407.

Recommendation:

- Since there are no in-situ combustion oil wells operating in the District and no emissions reduction could be achieved, District staff is not recommending this source category as a control measure.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Glycol Dehydration Systems (S-PET-15)

(Oil & Gas Production)

Source Category:

This source category includes facilities that have glycol dehydration systems with glycol dehydration vents. Glycol dehydration is employed in the natural gas production industry to remove water vapor from the produced gas.

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

- The emission inventory for this source category is not available. Further research into the particular source category emissions inventory is needed.
- District Rule 4408 was adopted December 19, 2002 and applied to 29 permitted natural gas dehydration units in the SJVAB. Currently there are 13 permitted units in the SJVAB.

- EIC Affected: 310-356-0110-0000

Current Control:

- District Rule 4408 requires gas dehydration facilities to control VOC emissions from glycol regenerator vents by using one of the following methods:
  - Vapor collection and disposal systems
  - Venting of collected vapors to a combustion source
  - Any control that reduces the VOC emissions by 95% averaged over 1 hour, or that controls glycol dehydration vent VOC emissions to a level no higher than 1.7 pounds of VOC per million dry standard cubic feet of gas dehydrated, averaged over 24 hours
- Sources within the District must meet the federal Maximum Achievable Control Technology (MACT) requirements for Hazardous Air Pollutants (HAPS). The federal MACT for glycol dehydration is currently covered under District Rule 4002, which incorporates the requirements in 40 CFR Part 63, subpart HH, the *National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities*. The MACT standard requires controls of the HAPs, which in general, are also VOCs.

Future Control Options:

- None. The current rules and requirements fulfill MACT standards.

Discussion:

- Gas production facilities are stationary sources for which the District has legal authority to regulate air emissions.
- The District rule is as stringent as any existing rule. It also requires more advanced testing methods. There are no Best Available Retrofit Control Technologies (BARCT) or requirements that are more effective than the current rule requirements. Current controls meet MACT standards.

Glycol Dehydration Systems
(Continued)

Recommendation:

- District staff does not recommend pursuing this as a control measure. No additional reductions are available from this source category.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Heavy Crude Oil Components (S-PET-16)

(Oil and Gas Production; Petroleum Refining)

Emissions Inventory:

With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ

- ARB emissions inventory database does not account for VOC emissions from heavy crude oil components.
- A District consultant's recent report indicated that the uncontrolled emissions from heavy crude oil components is about 0.6 tons per day based on extrapolation of the average number of components per light crude oil well used by District staff during the development of Rule 4409. A better method of estimating emissions is to determine the actual total number of components used in heavy crude oil production and oil refining facilities and calculate the emissions based on CAPCOA or EPA methodology.
- A thorough survey of all heavy crude oil producers within the District should be conducted to determine the total number of heavy crude oil components. Upon completion of the survey, the emissions will be calculated and the ARB emissions inventory database will be updated.
- EICs Affected: 310-302-0110; 310-302-1600; 310-304-1600; 310-306-1600; 310-308-1600; 310-308-0110; 310-310-0110; 310-310-1600; 310-316-1600; 310-352-0100; 320-302-0010; 320-304-0010; 320-306-0010; 320-316-0010

Current Control:

- The District has no existing prohibitory rule for controlling VOC emissions from heavy crude oil components.
- Existing District Rule 4401 regulates VOC emissions from steam enhanced crude oil production well vents. However, the component leak provisions of Rule 4401 only applies to components that carry gaseous streams and are associated with the VOC control system used in controlling casing gas emissions from well vents. Components that carry liquid streams are exempt from Rule 4401.

Future Control Options:

- Implement a leak detection and repair (LDAR) program to control VOC emissions from leaking heavy crude oil components.

Discussion:

- The sources are located at stationary sources for which the District has legal authority to regulate air emissions.
- Implement a leak detection and repair program (LDAR) similar to existing Rule 4409 and Rule 4455. LDAR would include leak thresholds, periodic inspection to identify leaking components, repair of leaking components within a specified period of time. An effective LDAR program may achieve at least 90% reduction from current uncontrolled emission level for specific components.

Heavy Crude Oil Components
(Continued)

- Other air districts have implemented rules that regulate fugitive VOC emissions from leaking components from light crude oil production as well as heavy crude oil production facilities.
- Establish prohibitory rule requirements that regulate VOC emissions from heavy crude oil components. The rule should apply to heavy crude oil production facilities and crude oil and crude oil refineries.

Recommendation:

- Due to the lack of emissions inventory for heavy crude oil components, staff recommends this source category as a control measure for further study.
- Based on the current emissions inventory or lack thereof, control level, and existing technology, emission reductions are not quantifiable for this source category. However a future study to re-evaluate this source category is planned.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Storage of Organic Liquids (S-PET-17)

(Oil & Gas Production, Petroleum Refining, Petroleum Marketing, Chemical, Mineral Processes)

Source Category:

Rule 4623 (Storage of Organic Liquids) controls volatile organic compound (VOC) emissions from organic liquids in storage tanks. These businesses are engaged in the general activities of petroleum production, petroleum pipelines, petroleum refining, petroleum bulk stations and terminals, and petroleum and petroleum products wholesalers; and chemical and mineral processes.

Emissions Inventory:

With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.107	0.109	0.109	0.109	0.11	0.12	0.12	0.107

- There are at least 3,000 chemical tanks less than 1,100 gallons capacity located in crude oil production facilities within the District.
- Emissions these chemical tanks are not accounted in the current ARB emissions inventory. Emissions inventory will be upgraded after conducting a survey of oil producers or providers of chemicals tanks.
- EICs Affected: 310-326-1600; 310-326-1610; 310-328-1130; 310-328-1600 310-995-1600; 320-324-1224; 320-326-1000; 320-326-1214; 320-326-1410; 320-326-1610; 320-328-1000; 320-328-1110; 320-328-1214; 320-328-1410; 320-328-1610; 330-322-1214; 330-322-1224; 330-322-1600; 330-322-1610; 330-324-1224; 330-324-1600; 330-326-1110; 330-326-1210; 330-326-1420; 330-326-1610; 330-328-1000; 330-328-1110; 330-328-1130; 330-328-1222; 330-328-1600; 330-328-1610; 410-400-2036; 410-400-2038; 410-400-2054; 410-400-2058; 410-400-2062; 410-400-3286; 410-400-5700; 410-400-5800; 410-995-3000; 410-995-4999; 410-995-5800; 430-328-7006

Current Control:

- District Rule 4623 regulates VOC emissions from tanks that store organic liquids if the tank capacity is 1,100 or greater and the true vapor pressure (TVP) of the stored liquid is 0.5 psia or greater.
- Current VOC controls require pressure-vacuum relief valves, internal floating roof tanks, external floating roof tanks, fixed roof tanks with vapor recovery system of at least 95% control efficiency, or pressure vessels. Specific control requirements vary depending on the tank capacity and TVP of the stored liquid.
- Different tank control requirements are specified for tanks operated by small producers or by non-small producers.
- Leak detection and repair (LDAR) provisions include periodic inspection and repair of leaking components within a specified time frame. The component leak standard is 10,000 ppmv.

Storage of Organic Liquids
(Continued)

Future Control Options:

- Control of VOC emissions from tanks could be achieved by operating a VOC capture and control system on fixed roof tanks with a control efficiency of 99%. This option may require retrofit of existing tanks.
- External floating roof tanks and internal floating roof tanks could be retrofitted with state-of-the-art dual-seal (primary seal and secondary seal) and by minimizing the gaps between the seal system and the tank wall. This option would require replacement of existing seal systems. A reduction of at least 20% may be achieved by replacing with BACT type seals.
- Pressure vessels designed to handle high pressure vapors that prevents venting to the atmosphere could be used for high TVP organic liquids. Control efficiency of pressure vessels is about 99%.

Discussion:

- These operations are located at stationary sources for which the District has legal authority to regulate air emissions.
- Current Rule 4623 is the most stringent rule in the state and the nation.
- Best control option is to replace all floating roof tanks with fixed roof tanks that have a VOC control system with at least 99% control efficiency.
- Upgrading seal systems of floating roof tanks to BACT type seals cost less than replacing such tanks with controlled fixed roof tanks. Upgrading to BACT type seals could achieve about 20% emissions reduction from current controlled emissions from existing floating roof tanks.
- Lowering the current TVP threshold from 0.5 psia to 0.1 psia could reduce current emissions by as much 80% from current controlled emission level.
- Changing the tank size applicability from 1,100 gallons to 251 gallons to realign the rule to current permitting threshold for tanks pursuant Rule 2020 could also achieve some emission reduction. Emissions reduction could be calculated after conducting a survey as stated above.
- Lowering the current component leak threshold of 10,000 ppmv similar to the standards of Rule 4409 and Rule 4455 could achieve about 90% reduction in fugitive VOC emissions from leaking components. Actual number of tank components would need to be determined to evaluate reductions from lowering the leak threshold.

Recommendation:

- This is not recommended as a control measure since no appreciable additional reductions are available from this source category, which is very well controlled.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Heavy Oil Test Stations and Gauge Tanks (S-PET-18)

(Oil & Gas Production)

Source Category:
This source category pertains to heavy oil test station (HOTS) and gauge tanks that are used in crude oil production facilities.

Emissions Inventory:
With current controls and regulations: does not reflect reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.26	0.25	0.24	0.24	0.22	0.22	0.21	0.23

- ARB emissions inventory only includes emissions from HOTS. Emissions from uncontrolled gauge tanks subject to Rule 4401 are not accounted in the current inventory.
- EIC Affected: 310-350-1600

Current Control:
- District Rule 4404 regulates VOC emissions from HOTS used in heavy crude oil production facilities by prohibiting operation of HOTS unless the emissions are controlled to at least 99% by weight.
- Rule 4404 also requires tank roof openings be equipped with a cover, seal, or lid that must be closed at all times, with no visible gaps, maintained in gas-tight condition except when the device or appurtenance is in use. Pressure-vacuum valves on the tanks must be set within 10% of the maximum allowable operating pressure of the tank.
- District Rule 4401 regulates VOC emissions from steam enhanced crude oil production well vents (casing gas) by requiring 99% reduction of uncontrolled emissions.

Future Control Options:
- For Rule 4404, there is no future control option for HOTS because they are already controlled to 99%. District staff does not believe that facilities could control HOTS VOC emissions by more than 99%.
- For Rule 4401, staff would need to determine the total number of uncontrolled gauge tanks operating within the District and then evaluate their emissions. Emissions from uncontrolled gauge tanks could be reduced to at least 99% by retrofitting the tanks with a VOC collection and control system. The cost effectiveness of such a retrofit has to be evaluated, and it may be a factor in pursuing alternative compliance methods for this source.

Discussion:
- These sources are located at facilities for which the District has legal authority to regulate air emissions.

Heavy Oil Test Stations and Gauge Tanks
(Continued)

- Rule 4404 regulates VOC emissions from HOTS. The rule defines HOTS as a family tank and a test tank. A family tank is a tank that receives crude oil produced from more than one steam drive well. A test tank is a tank that measures the production rate from a steam drive well. Based on the District's permit database and Compliance Division's recent oil field evaluation, there is only one facility within the District that is currently operating permitted HOTS and the emissions are already controlled to 99% pursuant to Rule 4404.
- For Rule 4401 is currently undergoing rule development process as a control measure commitment in the 1-hour Ozone Plan. Gauge tanks are used to measure the production rate of steam drive wells and cyclic wells. Under the current draft rule proposal, emissions from existing gauge tanks would not require control provided the capacity is 100 barrels or less and the true vapor pressure of crude oil in the tank is less than 0.5 psia. These small tanks are exempt from permits pursuant to Rule 2020 because the capacity and TVP are below the applicability thresholds of Rule 4623.
- Preliminary data indicate approximately 196 permit exempt gauge tanks in Kern River oil field. One stakeholder reported that the estimated the VOC emissions from their 196 uncontrolled gauge tanks is about at 0.007 tons per day, and the cost effectiveness of controlling the tanks is about $1.1 million per ton of VOC reduced.
- A survey to determine the total number of uncontrolled gauge tanks in the District is needed to establish a more accurate emissions inventory, and then evaluate cost effective methods of controlling the emissions for this source category.
- No other California air districts have rules that regulate HOTS. SCAQMD and Monterey Bay AQMD have rules regulating steam enhanced crude oil production well vents and their requirements are comparable to existing Rule 4401.

Recommendation:

- Since Rule 4404 implements the most stringent control requirements of 99% control efficiency no further emissions reduction is technologically achievable.
- Staff recommends Rule 4401 as a control measure for further study to determine the total number of gauge tanks and then establish the emissions inventory for this source category.
- Investigate an alternative compliance method or incentive programs to more cost effectively reduce emissions from the retrofitting of small gauge tanks.
- Based on the current emissions inventory or lack thereof, control level, and existing technology, emission reductions are not quantifiable for this source category. However a future study to re-evaluate this source category is planned.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Components at Refineries, Gas Processing Facilities, and Chemical Plants (S-PET-21)

(Petroleum Refining, Chemical)

Source Category:
This source category pertains to components carrying VOC-containing fluids that are used in petroleum refineries, chemical plants, and natural gas liquids processing facilities. Components are devices such as flanges, connectors, valves, pumps, compressors, well head polished stuffing boxes, pressure relief devices (PRDs), etc.

Emissions Inventory:
With current controls and regulations: does not reflect reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.190
VOC* adj	0.233	0.026	0.026	0.026	0.026	0.026	0.026	0.026

* Emissions inventory does not reflect reductions resulting from recently adopted Rule 4455. The adjusted inventory accounts for the 89% reduction from previously controlled emissions level resulting from Rule 4455 implementation effective April 2006.

- EICs Affected: 320-302-0010; 320-304-0010; 320-306-0010; 320-316-0010

Current Control:
- Previous Rule 4451 and Rule 4452 regulate VOC emissions from components used in petroleum refineries, chemical plants, and natural gas liquids processing facilities. These rules have been superseded by more stringent leak detection and repair (LDAR) requirements of recently adopted Rule 4455 effective April 2006.
- Leak thresholds: Major gas leak: >10,000 ppmv
  Minor gas leak: 100 – 10,000 ppmv (depending on component type and whether components are in liquid service or gas service). Major liquid leak: visible mist or continuous flow. Minor liquid leak: not a major liquid leak and >3 drops/minute.
- Major provisions include:
  - Daily audio-visual inspections of accessible operating pumps, compressors, and PRDs.
  - Physical identification (affixing tag or label) of major components and critical components to facilitate inspection and repair of leaks.
  - Quarterly inspection of components using a portable hydrocarbon analyzer to detect leaks, except for inaccessible components and pipes which must be inspected annually. Critical components and unsafe-to-monitor must be inspected during each process equipment turnaround period.
  - Minimizing leaks to the maximum extent possible within 1 hr of leak detection, and then repairing them within 2 to 7 days, depending on the leak concentration level (i.e., larger leaks must be repaired within a shorter period than allowed for smaller leaks).
  - Re-inspection of components within 15 days after being repaired or replaced.

Components at Refineries, Gas Processing Facilities,
and Chemical Plants
(Continued)

- Frequently leaking components must be replaced with BACT type equipment, vent the components to a closed vent system, remove components from operation.
- Limit on allowable number of leaking components, and includes provisions on conditions that constitute a violation of rule.
- Monitoring of PRDs using electronic process control instrumentation or telltale indicators. Conducting failure analysis or connecting the PRDs to a closed vent system, depending on the quantity of gas that releases into the atmosphere and frequency of the release.
- Initial inspection within 24 hours and re-inspection within 15 days after the date of each PRD that releases into the atmosphere.
- Maintaining records of inspection results and leak repair action taken.
- Submission of a comprehensive and detailed Operator Management Plan, including information on the number of components and location, inspection schedule, leak detection training, etc.

Future Control Options:

- No future control option is available for this source category. Rule 4455 implements the most stringent requirements that are technologically feasible.

Discussion:

- These sources are located at stationary sources for which the District has legal authority to regulate air emissions.
- Rule 4455 implements BARCT and All Feasible Control Measure and establishes the most effective LDAR standards to date.
- The rule is effective in 2006 and is expected to achieve 89% (0.37 tons/day) reduction from calculated emissions of 0.42 ton per day of VOC from this source category.

Recommendation:

- Not recommend as a control measure because no additional reductions are available from this source category. Rule 4455 implements the most stringent requirements that are technologically feasible.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Refinery Process Unit Turnaround (S-PET-22)

(Petroleum Refining)

Source Category:
The units subject to this source category are process units located at petroleum refineries, more specifically, during the time that the process units undergo "turnaround," a petroleum industry term meaning a scheduled shutdown of the process for maintenance and repair. There are four refineries within the District whose processes are subject to this rule.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ

- The current emission inventory does not have a specific emission source category for process unit turnaround. Further research and an industry survey would be needed to quantify the VOC emissions in this source category. In 2005, the total VOC emissions from all non-combustion sources at refineries were estimated at about 0.5 tons per day, summer season.

- EICs Affected: No assigned EIC is associated with this source category in the ARB emissions inventory.

Current Control:
District Rule 4454 limits VOC emissions from the venting of refinery process vessels during turnaround by specifying that the vented emissions be controlled until the pressure in the process vessel is 5 pounds per square inch, gauge (psig), or less.

Future Control Options:
- Restrict emission to the atmosphere to those units with headspace VOC concentration less than 10,000 parts per million by volume (ppmv) to match other air districts.

Discussion:
- Refinery process units are located at stationary sources for which the District has legal authority to regulate air emissions.

- By restricting the VOC concentration for that portion of process unit venting that is uncontrolled the uncontrolled venting of process units, the total amount of VOC released to the atmosphere would be less than under the current rule provisions.

- Further work is needed to determine how many units undergo process turnaround each year, and the approximate VOC concentration of the headspace just before the process unit is vented in an uncontrolled manner.

Refinery Process Unit Turnaround
(Continued)

Recommendation:

- District staff recommends that further study be done on this source category for the following reasons;
    - Total fugitive emissions from process unit turnaround only are not known because there is no specific emission category
    - The number of process unit turnarounds carried out each year is not known.
    - The VOC concentration in the headspace just before the process unit is allowed to vent uncontrolled is not known.
- Based on the current emissions inventory or lack thereof, control level, and existing technology, emission reductions are not quantifiable for this source category. However a future study to re-evaluate this source category is planned.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Refinery Vacuum-Producing Devices or Systems (S-PET-23)

(Petroleum Refining)

Source Category:
District Rule 4453 rule applies to any vacuum-producing device or system, including hot wells and accumulators installed in a refinery operation. There are four refineries in the District.

Emissions Inventory:
With current controls and regulations: does not reflect the reductions from the proposed control

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

- The emission inventory does not have a category for this type of equipment. Further study is needed to determine the emission inventory for this source category.

o EICs Affected: No assigned EIC is associated with this source category in the ARB emissions inventory.

Current Control:
District Rule 4453 applies operational requirements for refinery hot wells and accumulators as well as VOC control requirements for all other types of refinery vacuum-producing devices and systems.

Control Options:
- None

Discussion:
- Refineries are stationary sources for which the District has legal authority to regulate air emissions.

- No other air district has a more stringent limit or operational requirements than District Rule 4453; therefore no emission reductions are expected.

Recommendation:
- No additional reductions are available from this source category.
- Based on the current emissions inventory or lack thereof, control level, and existing technology, emission reductions are not quantifiable for this source category. However a future study to re-evaluate this source category is planned.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Refinery Wastewater Separators (S-PET-24)

(Petroleum Refining)

Source Category:
The source categories include all wastewater separators that remove petroleum or petroleum derived compounds from wastewater.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.19

- EIC Affected: 320-340-0010

Current Control: District Rule 4625 requires vessels used to recover oil to be covered or have a vapor recovery system. Separators with a surface area to volume loss ratio of greater than 420 are exempt.

Control Options:
- Require a 95% control efficiency for all vapor recovery systems. This will reduce VOC emissions by 5%.
- Establish leak thresholds and leak repair frequency requirements for treatment systems. Further study is needed to quantify VOC reductions.
- Other controls identified during rule development.

Discussion:
- The units in this source category are located at stationary sources for which the District has legal authority to regulate air emissions.
- Available VOC emission control systems achieve 95% control efficiency.
- Several components that carry and store streams of wastewater can develop leaks. Leak thresholds and repair frequency requirements can reduce VOC emissions. A survey is needed to determine the frequency, duration, and size of leaks in order to quantify the reductions from this control.

Recommendation:
- Based on the current emissions inventory or lack thereof, control level, and existing technology, emission reductions are not quantifiable for this source category. However a future study to re-evaluate this source category is planned.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Architectural Coatings (S-SOL-1)

(Architectural Coatings and Related Process Solvents)

Emissions Inventory:

With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	9.1	9.4	9.6	9.7	10.2	10.5	10.9	11.2

- EICs Affected: 520-520-91XX-0000; 520-520-92XX-0000

Current Control: District Rule 4601 specifies VOC coating limits from the state's 2000 Suggested Control Measure (SCM).

Future Control Options:

- Lower VOC limits, where feasible, to match those of other air districts, such as the limits proposed by the SCAQMD in their Draft Ozone Attainment Plan.
- Voluntary or incentivized non-use of high-VOC coatings during high-ozone days, as part of the Expanded Spare-the-air Day Program.

Discussion:

- Rule 4601 is currently at the same level of stringency as other air district rules that used the state's 2000 SCM as a template.
- Since the 2002 amendment of Rule 4601 and other district architectural coatings rules that reflect the 2000 SCM, SCAQMD has introduced new coating limits that are more stringent. As a result, coatings that meet these new limits have been introduced in the South Coast area beginning in 2005. The new limits are phased-in and by July 1, 2008, all new limits will be applicable.
- Stakeholders are encouraged to comment on technical feasibility, potential future technological advances, and costs and economic impacts.
- Sell-through provisions for products would assist sellers in complying with new VOC limits.

Recommendation:

- Amend Rule 4601 to lower VOC limits, matching South Coast limits where feasible.
- Explore the inclusion of provisions for sell-through of products.
- Include this source category in the Expanded Spare-the-air Day Program for voluntary or incentivized non-use during the ozone season.

Projected Reductions:

With recommended controls

Emissions Reduction, Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.00	0.00	2.0	2.1	2.1	2.2	2.3

The reductions accruing from lowering the VOC limits of the thinning/cleaning solvents category is being determined. The thinning VOC reductions will be added to the architectural coatings reductions above. The cleaning VOC reductions will be part of the current rule making reductions for the cleaning and degreasing operations rule.

Motor Vehicle and Mobile Equipment Coating Operations (S-SOL-2)

(Coatings and Related Process Solvents)

Source Category:

This source category includes operations that apply, supply, sell, offers for sale, or solicits the application of VOC-containing coatings used in the finishing or refinishing of Vehicles and Equipment, and their parts and components. This also includes the organic solvent cleaning, and the storage and disposal of all solvents and waste solvent materials associated with such coating operations.

Emissions Inventory:

With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	2.048	2.098	2.134	2.146	2.169	2.199	2.228	2.256
VOC adj.	2.05	2.10	1.54	1.55	1.57	3.04	1.61	1.63

- District Rules 4602 and 4612 have been recently been amended. The estimated emission reductions have been incorporated in the VOC adj. emission inventory.

Current Control: District Rules 4602/4612 limits the VOC content limit of coatings used to coat motor vehicles and mobile equipment. In lieu of complying with VOC content limits, operators may operate an APCO-approved VOC emission control system. District Rule 4612 replaces District Rule 4602 on January 1, 2009. District Rule 4612 incorporates all of the elements of the California Air Resources Board's (ARB's) Suggested Control Measures (SCM) for this source category.

Future Control Options:

- Solvent cleaning provisions are being added to District Rule 4612 as part of the "Solvent Cleaning" control measure; please see the S-SOL-7 & 8 control measure for solvent cleaning and degreasing for the elements of that control strategy. These new provisions will incorporate more stringent VOC content limits for cleaning solvents adopted in other air districts.

Discussion:

- All of the coating operations and associated solvent-cleaning operations are located at stationary sources for which the District has legal authority to regulate air emissions.
- The recently completed rule project encompasses the most stringent coating VOC content limits for this source category.
- Solvent cleaning provisions added to Rule 4612 are expected to be the most stringent available for the source category.

Recommendation:

- No additional reductions are available from this source category.

- Explore opportunities for incentive funding to achieve additional emission reductions from this source category; see Chapter 7 of this Plan for additional information regarding incentive funding.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Surface Coating of Metal Parts and Products (S-SOL-3)

(Coatings and Related Process Solvents)

Source Category:
This source category covers permitted stationary sources that coat metal furniture and fixtures, metal parts and products. The coatings may be oil-based or water-based.

Emissions Inventory:
With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.57	0.60	0.66	0.68	0.76	0.81	0.86	0.88

- EICs Affected: 230-226-9000; 230-226-9100; 230-226-9200; 230-230-9020; 230-230-9050; 230-230-9052; 230-230-9054; 230-230-9100; 230-230-9200

Current Control: District Rule 4603 requires the use of compliant VOC coating and solvent limits.

Future Control Options:
- Lower coating limits to match recently amended rule in another air district
- Cleaning solvents VOC is being lowered, as part of general solvent cleaning rule project, currently in progress.

Discussion:
- Air-dried coatings have a VOC content limit of 275 grams per liter compared to the current content limit of 340 grams per liter. This represents a 19% reduction for this coating.
- Consider removing the exemption for touchup coatings or revising the exemption for touch-up coatings to allow only for facilities using small quantities.
- If the air-dried coatings represent 20% of the total baseline emissions, then estimated emissions reductions would be about 3.8%.
- Consider an added or limited exemption for users of specialty coatings that require high VOC limits for special applications.

Recommendation:
- This source category is not recommended as a control measure. No appreciable additional reductions are available from this source category.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Wood Products Coating Operations (S-SOL-4)

(Coatings and Related Process Solvents)

Source Category:
This source category includes all material applied onto or impregnated into wood for protective, decorative, or functional purposes, such as paints, varnishes, sealers, and stains.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	1.2	1.3	1.4	1.4	1.6	1.7	1.8	1.9

- EICs Affected: 230-232-9XXX

Current Control: District Rule 4606 sets VOC content limits for coatings. In lieu of adhering to the VOC limits, owners/operators may use VOC control devices with a control efficiency of at least 85%, by mass. District Rule 4606 exempts aerosol coatings; coating used in quantities of less than 20 gallons per year; coatings used for specific limited uses; and coatings used for specific limited finishes.

Control Options:
- Reduce certain VOC limits by 30% to 50% to match limits in other air district rules. Operators using these materials would be required to either switch to a compliant coating or install and maintain a VOC emission control system. Ten percent of the emissions will be affected by this change thus; overall VOC reductions are approximately 3%.
- Increase the control efficiency of VOC control devices by 10%, which would require retrofit or replacement of existing equipment. Few facilities operate systems that would not comply with the proposed control efficiency, thus reductions are negligible.

Discussion:
- Coating use is located at stationary sources for which the District has legal authority to regulate air emissions.
- If the limits for VOC content were reduced, operators would have the option to either install and maintain a VOC emission control system or switch to compliant material. In light of the capital costs associated with a VOC emission control system, it is mostly likely that operators would choose to use compliant material.
- During the rule development process, District staff will consider the following options:
    - Allow the exemption threshold of less than 20 gallons per year of coating to remain as it is, or

- Reduce the exemption threshold of 20 gallons of coatings per year to 1 gallon of coatings per year and some of the exemptions for furniture operations could be removed. This would reduce emissions by approximately 5%.

Recommendation:

- This source category is not recommended as a control measure. No appreciable additional reductions are available from this source category considering the lack of active facilities operating within the District.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Glass Coating Operations (S-SOL-5)

(Coatings and Related Process Solvents)

Source Category:
District Rule 4610 applies to any major source that coats glass products with VOC-containing materials.

Emissions Inventory:
With current controls and regulations: does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

- EIC Affected: 230-226-9100

Current Control: Operators have VOC content limits for coatings with an option to use a VOC emission control system, if they use non-compliant coatings. Mirror backing coating has the additional requirement that the VOC emissions from this operation be reduced by an additional 90%. The following operations are exempt from the VOC content limits: touch-up and repair; stencil coatings on clear or transparent substrates; coatings applied at a paint manufacturing facility while conducting performance tests on the coatings; and aerosol coating products.

There is one known facility that was subject to this rule; however, the facility has subsequently reduced its total permitted emissions so that the facility is no longer subject to this rule but the source continues to meet the rule limits through permit requirements which still apply.

Future Control Options:
- Change the rule applicability to apply to all glass-coating operations at stationary sources. No additional industrial sources for this type of coating operation currently exist within the District.

Discussion:
- Glass coating operations are located at stationary sources for which the District has legal authority to regulate air emissions.

- No other California air district regulates this source category. The VOC coating content limits established in the rule, for some coating categories, require both the use of a compliant coating and 90% VOC emission reduction which is a more stringent control approach than any other coating limit in the state.

Glass Coating Operations
(Continued)

- The only known facility in this source category is already meeting the stringent limits set by the rule as conditions in their Permit to Operate. There are no other industrial sources for this type of coating operation in the District therefore; no additional VOC emission reductions are expected from this source category.

Recommendation:

- This source category is not recommended as a control measure. No additional reductions are available from this source category.

Projected Reductions:

With recommended controls

Emission Reductions - Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Adhesives (S-SOL-6)

(Adhesives & Sealants)

Source Category:
This source category includes the manufacture, sale, and use of adhesives and the solvents associated with the use of adhesives.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	3.2	3.3	3.5	3.6	3.9	4.1	4.3	4.9

- EICs Affected: 250-292-8200; 250-292-8202; 250-292-8250

Current Control:

- District Rule 4653 sets VOC content limits for adhesives. In lieu of adhering to the VOC limits, owners/operators may use VOC control devices with a control efficiency of at least 85%, by mass. Adhesives used in laboratories, sold for specific limited uses, sold in quantities no more than 8 ounces, or used in quantities of no more than 20 gallons per year are exempt. VOC emissions are over 80% controlled, compared to uncontrolled emissions.

Future Control Options:

- Reduce certain VOC limits by 30% to 50% to match limits in other air district limits. Operators using these materials would be required to either switch to a compliant coating or install and maintain a VOC emission control system. Ten percent of the emissions will be affected by this change, thus overall VOC reductions are approximately 3%.
- Increase the control efficiency of VOC control devices by 10%, which would require retrofit or replacement of existing equipment. Few facilities operate systems that would not comply with the proposed control efficiency, thus reductions are negligible.
- Require use of high volume low pressure (HVLP) spray equipment for specific applications. A survey is needed to determine which applications could cost-effectively install HVLP spray equipment, and thus the reductions achievable.
- The solvent limits in Rule 4653 are being amended in a current rule development project and addressed in the Solvent Clean control measures.

Discussion:

- Adhesive manufacture, sales, and use are located at stationary sources for which the District has legal authority to regulate air emissions.
- If the limits for VOC content were reduced, operators would have the option to either install and maintain a VOC emission control system or switch to compliant material. In light of the capital costs associated with a VOC emission control system, it is mostly likely that operators would choose to use compliant material.

Adhesives
(Continued)

- HVLP spray equipment reduces the amount of adhesives used, time needed to apply adhesives, and possibly 25% of the VOC emissions from the source if this technology can be used for these types of coatings. Adhesives are more viscous than traditional coatings. Facilities with high adhesive or labor costs can cost-effectively install and maintain HVLP equipment. Other facilities may not be able to cost-effectively install HVLP without significant incentivization.
- District staff estimates that this rule project will take 16 months to go from scoping meeting to public hearing

Recommendation:

- Pursue as a control measure lowering the VOC content of adhesives. The VOC emission reductions would be approximately 3% of the baseline emissions. A 12-month compliance schedule is recommended to allow operators sufficient time to find alternative compliant materials for their operations.
- Explore inclusion of HVLP spray equipment requirements during rule development, taking into consideration the socioeconomic cost impacts of such requirements.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.11	0.12	0.12	0.13	0.15

*The reductions listed above only include reductions achieved by lowering the limits for VOC content in the adhesives.

Aerospace Assembly And Component Coating Operations (S-SOL-7)

(Coatings and Related Process Solvents)

Source Category:
District Rule 4605 applies to the manufacturing, assembling, and coating of aerospace components, the cleanup of equipment, and the storage and disposal of solvents and waste solvent materials associated with these operations.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

- EICs Affected: 230-238-9100, 230-238-9200

Current Control:
District Rule 4605 sets VOC content limits for coatings, adhesives, and other related VOC-containing materials for coating operations related to aerospace assemblies and components. The flushing of jet or rocket engines using any solvent other than trichloroethylene is exempt. Aerospace assembly and component coating operations using less than four gallons per day of VOC-containing products are exempt as are other coatings or adhesives. Materials used in laboratories associated with research and development, quality control, or production testing are exempt from VOC content limits. There is also a limited exemption from application equipment standards. VOC emissions are 50% controlled compared to uncontrolled emissions.

Future Control Options:

- Reduce VOC content limit for two coatings and one chemical maskant to match other air districts limits. Operators using these materials would be required to either switch to a compliant coating or install and maintain a VOC emission control system.

Discussion:

- Aerospace coating operations are located at stationary sources for which the District has legal authority to regulate air emissions.

- If the limit for VOC content were reduced for some coatings/maskants, operators would have the option to either install and maintain a VOC emission control system, or switch to compliant materials. In light of the capital costs associated with a VOC emission control system, District staff believes that operators would chose to use compliant materials.

(Continued)

- The quantity of the identified coatings and chemical maskant used within the District is not known at this time. It is expected that the amount of emission reductions will be small since the baseline VOC emission inventory is small and the number of materials to be adjusted is small compared to the number of coatings/adhesives/sealants associated with the entire source category and rule.

- District staff estimates that this rule project will take about 16 months to go from scoping meeting to public hearing.

Recommendation:

- This source category is not recommended as a control measure. No additional reductions are available from this source category.

Projected Emission Reduction:

With recommended controls

Emission Reductions Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Solvent Cleaning Operations (S-SOL-11)

(Coatings and Related Process Solvents; Wood and Paper; Other [Cleaning and Surface Coating]; Chemical; Degreasing)

Source Category:
This source category includes the organic solvent degreasing operations and any other organic solvent cleaning operation performed outside of a degreaser. The operations subject to source category are diverse, encompassing a broad range of industries.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	7.1	7.5	8.0	8.1	8.5	8.9	9.3	9.9

- EICs Affected: 220-204-0500, 220-204-3008, 220-204-3022, 220-204-3083, 220-204-3176, 220-204-3204, 220-204-3246, 220-204-3333, 220-204-3339, 220-204-3344, 220-204-8104, 220-204-8106, 220-206-3083, 220-206-3107, 220-206-3246, 220-206-3300, 220-206-3301, 220-206-3328, 220-206-3344, 220-206-3346, 220-206-8106, 220-208-0500, 220-208-3022, 220-208-3083, 220-208-3176, 220-208-3204, 220-208-3246, 220-208-3333, 220-208-3339, 220-208-3344, 220-208-3346, 220-208-8104, 220-208-8106, 230-216-8350, 230-240-0500, 230-240-3008, 230-240-3060, 230-240-3202, 230-240-3232, 230-240-3252, 230-240-3372, 230-240-8300, 230-240-8302, 230-240-8350

Current Control: District Rule 4662 controls VOC emissions from organic solvent degreasing operations by specifying solvent VOC limits, allowable application equipment, and emission control options. District Rule 4663 controls VOC emissions from organic solvents used to clean parts and equipment outside of the degreasers covered by District Rule 4662. The other District rules address solvents used to prepare surfaces and clean equipment used in the applicable operation addressed by the rules.

Future Control Options:
- Reduce the allowable VOC content of cleaning solvents to match other air districts.

Discussion:
- All of the solvent-cleaning operations are located at stationary sources for which the District has legal authority to regulate air emissions.
- Amending these rules was identified as a state-required "All Feasible Measure". This control measure is intended to reduce VOC emissions from organic solvents used in parts and equipment cleaning by incorporating more stringent VOC content limits.

Solvent Cleaning Operations
(Continued)

- District staff will consider the following stakeholder suggestions during the rule development project:
  - SCAQMD's current VOC limits for cleaning solvents and Yolo-Solano's proposed control measure to set all solvents used in graphic arts cleaning at 72 grams per liter.
  - Solvent vapor pressure in lieu of VOC content will be considered as an option for the end user.
  - Exempting cleaning operations associated with the manufacture of paint, coatings, resins, and adhesives and exempting the stripping of cured coatings, cured ink, or cured adhesives. As noted by commentors to the plan, the manufacture and use of paint, resins, and adhesives require strong solvents to effectively clean production/process equipment. Coatings, ink, and adhesive manufacturing and application industries need to be able to use recycled or reclaimed solvents in cleaning operations, otherwise the industries will be faced with increased hazardous waste disposal and purchasing of cleaning materials.
  - Cost effectiveness and availability of lower VOC cleaning materials.
- Amendments to these rules are scheduled for the third quarter of 2007 with full implementation scheduled for the fourth quarter in 2008.

Recommendation:
The second workshop for this rule project is tentatively scheduled for late January 2007. Tentative public hearing is anticipated for the third quarter of 2007.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.00	1.3	1.32	1.39	1.46	1.53	1.62

Graphic Arts (S-SOL-20)

(Coatings and Related Process Solvents; Printing)

Source Category:
This source category includes any graphic arts printing operation, to any paper or fabric coating operation, to the organic solvent cleaning, and to the storage and disposal of solvents and waste solvent materials associated with such operations.

Emissions Inventory:
With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	1.7	1.7	1.9	1.9	2.1	2.2	2.3	2.3

- EICs Affected: 240-240-3314, 240-240-8302, 240-995-8000, 240-260-8400, 240-262-8400, 240-264-8400, 240-266-8350, 240-266-8400.

Current Control:
District Rule 4607 sets VOC content limits for inks, coatings, and other related VOC-containing materials for printing and coating operations related to graphic arts. VOC content limits are as stringent as any other air district in California, with the exception of flexography printing on porous substrates. Except for the keeping of records, the current rule does not apply to graphic arts printing operations that emit less than 400 pounds of VOC per calendar month. The provisions VOC content limits for paper and fabric coating do not apply to the application of coatings via aerosol containers. Certain operations are also exempt from the rule.

In 2005, the rule applied to approximately 58% of all graphic arts operations, with actual VOC emissions ranging from 35% to 51% of the uncontrolled emissions.

Future Control Options:
- Increase overall capture and control efficiency of VOC emission control system from the current range of 67%-75% to 75%-85% for certain types of coating operations. This would match similar provisions in other air districts.
- Reduce VOC content limits for flexography printing on porous substrate by 25% to match limits in other air districts.
- Amend the exemption section so that the exemption applies to all operations that emit less than 60 lbs of VOC per month.

Discussion:
- Graphic arts operations are located at stationary sources for which the District has legal authority to regulate air emissions. The most straightforward option for VOC emission reductions would be to increase the overall capture and control efficiency of VOC emission control systems to reduce VOC emissions from this source category. For operations that already have VOC emission control systems, the change in overall control efficiency would most likely require redesign of the capture devices to increase capture (collection) efficiency, since VOC control devices are typically VOC

Graphic Arts
(Continued)

destruction devices with VOC control efficiencies greater than 95%. However, few facilities use VOC emission control devices to meet the current VOC content limits of the rule, so total VOC emission reductions from this control option are assumed to be less than 1% of the total VOC emission inventory.

- For most flexography printing, a change in VOC content limit would mean choosing a different coating/ink rather than installing a VOC emission control system, since VOC emission control systems can cost hundreds of thousands of dollars to install. At this time, it is assumed that 1) the VOC emission inventory reflects all graphic arts operations, of which flexography is but one type, and 2) all of the flexography printing in the District is done on porous substrate, namely paper. Taken together, the assumptions would point to realizing at least some VOC emission reductions from tightening the VOC content limits for this specific process. Exact usage of flexography inks and coatings is not known at this time, therefore, District staff believes that VOC emission reductions would be 25% reduction in the VOC content limit, based on an assumption that flexography inks are 15% of the inventory and that all flexography printing occurs on paper (porous substrate).
- It is not known how many graphic arts printing operations take advantage of the 400 pounds VOC per month exemption in the current rule. Further VOC emission reductions might occur if the exemption is modified to include smaller facilities. Further study as part of a rule development project is needed to determine if it is feasible to pursue tightening the small facility exemption, especially the cost of compliant inks versus non-compliant inks as it impacts small businesses.
- It is expected that this rule project will take about 16 months to go from scoping meeting to public hearing.

Recommendation:
It is recommended that the future control options outlined above be pursued as a control measure. The total VOC emission reduction associated with increasing the overall capture and control efficiency of VOC emission control systems and decreasing the VOC content limit for certain operations is expected to be 4% of the baseline emissions. At this time, there is no estimate available for the number of graphic arts printing operations that would be added to the rule if the exemption level is changed. A 12-month compliance schedule is recommended, since District staff believes that most operators would choose compliant inks rather than installing VOC emission control systems.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	0.0	0.0	0.07	0.07	0.08	0.08	0.08

Consumer Products (S-SOL-21)

(Consumer Products)

Source Category:

This source category includes chemically formulated products used by household and institutional consumers such as detergents, cleaning compounds, polishes, floor finishes, cosmetics, personal care products such as antiperspirants & hairsprays, lawn & garden products, disinfectants, sanitizers, automotive specialty products & aerosol paints. Other paint products such as furniture/architectural coatings are regulated under separate District rules.

Emissions Inventory:

With current controls and regulations; does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	23.48	24.00	25.14	25.63	26.63	28.12	29.61	31.19

- EICs Affected: Series 510-500-XXXX-XXXX, and Series 510-506-XXXX-XXXX.

Current Control:

- Under the Clean Air Act, the Air Resources Board (ARB) has authority to achieve maximum technologically and commercially feasible reactive organic gas (ROG) emission reductions from consumer products. (Health and Safety Code 41712)

- ARB has adopted regulations, which contain nearly 200 emission limits affecting over 100 categories of consumer products.

- The following regulations fulfill the requirements of the California Clean Air Act:
  - Antiperspirants & Deodorants Regulation: Sets emission standards & requirements for only antiperspirants and deodorants.
  - Consumer Products Regulation: Sets VOC limits & regulations for 112 categories of household and institutional products such as detergents, cleaning compounds, polishes, floor finishes, cosmetics, personal care products, home, lawn and garden products, disinfectants, sanitizers, and automotive specialty products.
  - Aerosol Coatings Regulation: Establishes set emission standards & requirements for 36 categories of pressurized coating products including but not limited to spray paints.
  - Alternative Control Plan: Provides an alternative method to comply with VOC standards for consumer products and aerosol coating products.
  - Hairspray Credit Program Regulation: A voluntary program that provides incentives & rewards for early & over compliance with second-tier 55%VOC standard for hairsprays.

Future Control Options:

- The 2006 proposed Amendments to Consumer Products Regulation & Aerosol Coatings Regulation sets 18 new VOC limits affecting 15 categories achieving 10.6 tpd VOC emission reductions statewide by 2008 & 11.5 tpd by 2010. These amendments meet 2003 SIP Ozone commitments for Consumer Products & also fulfill certain requirements

Consumer Products
(Continued)

of a settlement agreement on ARB's progress under the SIP and were approved November 17, 2006 by the ARB Board. Products whose VOC limits have been made more stringent include automotive windshield wiper fluids, bathroom and tile cleaners, engine cleaners, floor polishers and waxes, general-purpose cleaners and degreasers and oven cleaners. Additional amendments are tentatively planned for consideration in March 2007 to clarify the definition of multi-function product categories of 'Multi-purpose Solvent" and "Paint Thinner", and clarify overlapping requirements for certain other consumer products. Other amendments will prohibit use of chlorinated toxic compounds; adjust VOC limits for nail polish removers; and exempt certain electronic cleaners from a soon-to-be effective VOC limit.

- Extensive product reformulations toward low or zero-VOC products.

- Pursue even more stringent emission standards.

- Enhance rule consistency by eliminating discrepancy between some stationary source and consumer product regulations allowing higher VOC limits for products sold as commercial products for home use versus the same product sold for industrial or commercial application under stationary source rules.

Discussion:

- Consumer products constituted 11% of total anthropogenic ROG emissions statewide in 2005. Due to population growth, ARB projects these emissions will increase to 12% of the total by 2010, even with significant reductions from control measures considered. Current controls have reduced emissions by 40% in 2010.

- ARB does not have authority to eliminate any product form-aerosol, liquid, solid or gel.

- A significant portion of consumer product emissions are not easily available for reduction: 1) Many represent very small categories emitting less than 0.1 tpd which make setting cost-effective limits difficult; 2) Multi-purpose solvents are a large source category, replacement with water or exempt solvents has not proved to be a viable option; and 3) The remaining portion comprise categories such as rubbing alcohol which are difficult to regulate due to health or efficacy concerns.

- The District has limited regulatory authority over consumer products, but can assist in reducing emissions by incorporating voluntary episodic control use of consumer products during Spare the Air days. Enhanced public education about the major contribution consumer products play on the environment could lead to more personal responsibility when choosing products.

Consumer Products
(Continued)

Recommendation:

- Support the ARB proposed March 2007 Amendments, which will clarify and strengthen the Consumer Products Regulation.
- Investigate feasibility of a labeling program to identify lower VOC products to enhance public awareness of available, more environmentally friendly products that are equally effective.
- Investigate feasibility of a usage limitation program for high VOC products.
- Increase public awareness of the emissions generated from the use of consumer products. Use the Spare the Air program to educate the public about available lower emitting, equally effective products. Encourage episodic control during Spare the Air days.
- Support state regulations promoting rule consistency between Consumer Products Rules and Stationary Source Rules (commercial/industrial) for identical products.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NA	NA	NA	NA	NA	NA	NA

Farm Equipment (M-IND-1)

(Farm Equipment)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	63.7	55.2	48.0	44.6	38.3	30.3	23.4	18.0
VOC	10.7	9.0	7.7	7.0	5.8	4.4	3.4	2.8

Current Control:

- The federal Clean Air Act prohibits states from regulating emissions from engines used in farming less than 175 horsepower-these "preempted" engines represent 80%of the compression-ignition engines operating in California
  Tier 1 standard for engines 50 to 750 hp is 6.90 g/bhp-hr.
  Tier 2 standards for engines 50 to 750 hp ranges from 4.5 to 5.2 g/bhp-hr, depending on model year and engine size.
  Tier 3 standards for engines 50 to 750 hp ranges from 2.8 to 3.3 g/bhp-hr, depending on model year and engine size.
- Carl Moyer Program-incentives to obtain early emission reductions

Future Control Options:

- The Tier 4 emission standard for NOx, will be phased in for engines 75 to 175 hp from 2012-2014, is 0.30 g/bhp-hr.
- The Tier 4 emission standard for NOx, will be phased in for engines 175 to 750 hp from 2011-2014, is 0.30 g/bhp-hr.
- Provide incentives for accelerated change-outs
- Implement registration and inspection program to detect excess emissions
- Work with EPA to establish nationwide lower-emission standards for new compression-ignition engines
- Episodic controls: restrict hours of operation during ozone season

Discussion:

- Support EPA and ARB efforts to strengthen standards
- Incentives can be used to accelerate change-outs to achieve earliest emission reductions possible
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Enhance the District's incentive programs for compression-ignition engines to increase modernization / engine retrofits and replacement rates.
- Explore opportunities for incentive funding to achieve additional emission reductions from this source category; see Chapter 7 of this Plan for additional information regarding incentive funding.

Farm Equipment
(Continued)

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Forklifts, Specialty Vehicles/Portable Generators, Pumps, Compressors, Farm Equipment, & Construction Equipment (M-IND-2)

(Off-Road Equipment)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Current Control:

- The federal Clean Air Act prohibits states from regulating emissions from engines used in farming less than 175 horsepower-these "preempted" engines represent 80%of the compression-ignition engines operating in California
- Emission standards for LSI model year 2007 and subsequent: 3.0g/bph-hr
- Carl Moyer Program-incentives to obtain early emission reductions

Future Control Options:

- Set lower emission standards for new gas engines (off-road spark-ignition engines 25 hp and greater
- District incentives for replacements
- Episodic controls to shift time of use
- Work with EPA to establish nationwide lower-emission standards for new compression-ignition engines
- Further incentivize electric forklifts
- Enhance and expand the Indirect Source Review program

Discussion:

- Support EPA and ARB efforts to strengthen standards
- Incentives can be used to accelerate change-outs to achieve earliest emission reductions possible
- Investigate episodic control to shift time of engine use on Spare the Air Days
- The Carl Moyer program has provided incentives to introduce 200 electric, near-zero emission forklifts
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Enhance the District's incentive programs for compression-ignition engines to increase modernization / engine retrofits and replacement rates.
- Explore opportunities for incentive funding to achieve additional emission reductions from this source category; see Chapter 7 of this Plan for additional information regarding incentive funding.

Forklifts, Specialty Vehicles/Portable Generators, Pumps, Compressors, Farm Equipment, & Construction Equipment (Continued)

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

- Reductions for this source category can be found in the ISR control measure

Land-Based Port Equipment (M-IND-3)

(Off-Road Equipment)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1
VOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Current Control:

- EPA and ARB engine standards:
  Tier 1 standard for engines 50 to 750 hp is 6.90 g/bhp-hr.
  Tier 2 standards for engines 50 to 750 hp ranges from 4.5 to 5.2 g/bhp-hr, depending on model year and engine size.
  Tier 3 standards for engines 50 to 750 hp ranges from 2.8 to 3.3 g/bhp-hr, depending on model year and engine size.
- ARB regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards, Best Available Control Technology (BACT)

Future Control Options:

- ARB Emission Reduction Plan-November Infrastructure Bonds-Port improvements
- Carl Moyer Program
- New lease agreements at ports-market participation concepts
- Cleaner engines, add-on emission controls, faster replacement with newer models, alternative fuels, electrification
- Emission control regulations
- Incentive programs
- Operational controls
- Education programs

Discussion:

- ARB's new regulation will accelerate modernization
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Investigate funding opportunities to accelerate implementation of ARB regulation

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Large Diesel Engines (M-IND-4)

(Off-Road Equipment)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Current Control:

- ARB emission standards on new equipment
- Fleet changeout standards
- Heavy duty engine changeout incentive program

Future Control Options:

- Alternative diesel fuels
- Reduced idling from construction equipment
- Blue skies series engines
- NOx emission control retrofit technology
- Off-road engine fleet upgrade
- Enhance and expand the Indirect Source Review program

Discussion:

- Support EPA and ARB efforts to strengthen standards
- Additional incentives can be used to accelerate change-outs to achieve earliest emission reductions possible
- Investigate episodic control to shift time of engine use on Spare the Air Days
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Enhance the District's incentive programs for compression-ignition engines to increase modernization / engine retrofits and replacement rates.
- Explore opportunities for incentive funding to achieve additional emission reductions from this source category; see Chapter 7 of this Plan for additional information regarding incentive funding.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Off-Road Equipment (M-IND-5)

(Off-Road Equipment)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	58.60	48.24	40.45	37.58	32.10	24.94	20.10	16.80
VOC	17.44	14.54	12.24	11.58	10.39	9.10	8.44	8.03

Current Control:

- Tier 1 standard for engines 50 to 750 hp is 6.90 g/bhp-hr.
- Tier 2 standards for engines 50 to 750 hp ranges from 4.5 to 5.2 g/bhp-hr, depending on model year and engine size.
- Tier 3 standards for engines 50 to 750 hp ranges from 2.8 to 3.3 g/bhp-hr, depending on model year and engine size.

Future Control Options:

- Reductions from federally preempted equipment could be used by alternative compliance facilities
- Implement Registration and Inspection Program for Existing Heavy-Duty Off-Road Equipment to Detect Excess Emissions [Compression-Ignition Engines]
- Pursue nationwide lower emission standards for HC, NOx, and PM emissions for new off-road Compression Ignition engines
- The Tier 4 emission standard for NOx, will be phased in for engines 75 to 175 hp from 2012-2014, is 0.30 g/bhp-hr
- The Tier 4 emission standard for NOx, will be phased in for engines 175 to 750 hp from 2011-2014, is 0.30 g/bhp-hr.

Discussion:

- Support EPA and ARB efforts to strengthen standards
- Investigate episodic control to shift time of engine use on Spare the Air Days
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Explore wider use of incentives to encourage fleet modernization.
- Explore opportunities for incentive funding to achieve additional emission reductions from this source category; see Chapter 7 of this Plan for additional information regarding incentive funding.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

SI Utility Engines (M-IND-6)

(Off-Road Equipment)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Current Control:

- ARB regulations on new engines. 3.0 g/bhp-hr HC+NOx for engines with displacement of less than 1.0 liter produced after 2001. 9.0 g/bhp-hr HC+NOx for engines with displacement of greater than 1.0 liter produced after 2002.
- Durability certification required for engines produced in 2007 and for subsequent years.

Future Control Options:

- Set lower emission standards for new non-preempt gas engines
- Clean up off-road gas equipment fleet through retrofit controls

Discussion:

- Retrofit of existing equipment could achieve an 80 percent reduction in exhaust emissions or meet emission levels equivalent to 3.0 g/bhp-hr HC+NOx. The retrofit technology would include a three-way catalyst and a closed loop control of the fuel system on some engines.
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Currently this source category is not a candidate for incentive funding, but further analysis and study is necessary to determine if this source category may garner cost effective reductions in the future provided funding sources are available. Please see Chapter 7 for any additional information.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Off-Road Portable Engines (M-IND-7)

(Off-Road Equipment)

Source Category: This source category includes facilities that operate portable engines & equipment used in a variety of applications such as well drilling & servicing, power generation, pumping, gas compression, pile driving, cranes, ground support equipment, wood chipping, dredging, abrasive blasting, concrete batching, rock, sand, or gravel processing.

Emissions Inventory:

With current controls and regulations: does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	16.6	14.0	10.0	10.8	9.2	7.4	7.0	5.2
VOC	1.5	1.3	1.3	1.0	0.9	0.7	0.6	0.5

Based on the District's database, there are approximately 2,500 portable diesel engines registered under the ARB PERP operating within the District. In addition, there are approximately 450 portable engines registered with the District under Rule 2280. Forty five percent of the total portable diesel engines are rated between 175-750 bhp, and the remaining 55% are rated less than 175 bhp and greater than 750 bhp. A more thorough analysis of this source category's inventory is needed to determine their current operation, in terms of location and model distribution.

Current Control:

- Federal Preemption: New off-road engines less than 175 hp used in farm and construction operations follow federal standards, as follows:
  (1) US EPA emission standards for newly manufactured diesel-fueled portable engines are tiered (i.e. Tier 1, 2, 3, and 4), with each standard phased in over several years based on the power rating of the engine and becoming progressively more stringent with each tier.
  (2) Newly manufactured large (greater than 25 hp) spark-ignition (LSI) engines sold in California are subject to ARB's LSI standards, which the US EPA also adopted. In addition US EPA has a more stringent standard: beginning in 2007, new LSI engines must meet a combined standard for NOx & hydrocarbons (HC) of 2.0 grams per brake horsepower-hour (g/bhp-hr).
- ARB's Airborne Toxic Control Measure (ATCM) for Diesel-Fueled Portable Engines: Requires portable diesel-fueled engines not permitted or registered prior to 1/1/2006; meet the most stringent of the federal or California emission standards for nonroad engines. Specifically, after 1/1/2006, engines rated 175 to 750 bhp must meet Tier 3 standards & engines rated greater than 750 bhp must meet Tier 2 standards to be accepted in ARB's Portable Engines Registration Program (PERP).
- Portable Equipment Unit Standards: Registered ARB's PERP units are required to meet emission limits (82 lbs/day of PM10 & 10 tons/year per pollutant per district per year per equipment unit), in addition to emission control requirements.
  Local Air District Permit Programs: Related to their attainment status, districts either exempt portable engines altogether or require emission limits, which some districts specify to BACT level & equivalent to ARB/US EPA off-road emissions standards.
- District Rule 2280 requires diesel-fired engines to be retarded by at least 4 degrees or NOx emissions not to exceed 10 g/bhp-hr (7.2 g/bhp-hr for turbocharged engines).

Off-Road Portable Engines
(Continued)

- The rule also limits sulfur content of diesel fuel to no more than 0.05% by weight. For spark ignition internal combustion engines, Rule 2280 has a NOx emission limit of 1.5 g/bhp-hr or less (100 ppmv or less at 15% O2), VOC is 1.5 g/bhp-hr (650 ppmv or less at 15% O2), and 2.0 g/bhp-hr or less (500 ppmv or less at 15% O2).
- The PERP: In lieu of obtaining multiple permits from individual districts, a portable engine owner can register the engine in PERP. By January 1, 2010, only engines certified to ARB/US EPA off-road engine emission standards (Tier 1, 2, or 3) can continue to operate in PERP. This means that any engines currently registered in the program that do not meet at least Tier 1 standards must be replaced with certified engines by that date.

Future Control Option:

- Upgrade District standards in Rule 2280 to ARB PERP standards.

Discussion:

- Based on emission level differences, a potential emission reduction from upgrading District portable engine standards to ARB' PERP standards appears significant. Sixty percent NOx reduction from the 450 portable engines registered with the District is approximately 1.5 tons per day.
- A small number of spark-ignited portable engines are operating within the District, however, they are not expected to generate comparable emissions reductions compared to upgrading existing non-certified diesel engines since spark-ignited engines typically meet or exceed applicable ARB or EPA standards.
- Emissions from older diesel engines can be reduced by replacing such units with cleaner EPA-certified diesel engines before allowing new registration or renewal of existing registration with the District.
- Inspection & maintenance (I/M) of off-road engines guarantees emissions remain at levels consistent with rule-based standards. Cost-effectiveness for I/M programs, in terms of $/ton of pollutant reduced is less than most ozone mitigation strategies.
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Upgrade District standards in Rule 2280 to ARB PERP standards.
- Institute I/M programs for off-road engines, & Explore opportunities for incentive funding to achieve additional emission reductions from this source category; see Chapter 7 of this Plan for additional information regarding incentive funding.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Green Contracting Programs (M-OTH-1)

(Use of low-emission vehicles and equipment, clean fuels, employer-based trip reduction programs, and other practices such as green building and energy-reducing construction by companies contracting with public agencies)

Emissions Inventory:

With current controls and regulations: does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Current Control: With the growing concern for global warming, green contracting programs are gaining ground in cities and counties across the U.S., and this has mostly taken the form of adopting ordinances voluntarily, since air districts do not have regulatory authority to require local government agencies to adopt these ordinances.

Control Options:

- Develop a model ordinance and promote its adoption by cities and counties for incorporation into local codes.
- Make green contracting an attractive option for companies by awarding incentive funding for the retrofit of off-road construction equipment, vehicle fleets, and other machines.
- Issue “Green Contractor Certification” to companies that fulfill certain criteria, as established by the District, including meeting fleet standards and completion of courses about equipment maintenance and operation.

Discussion:

- Reduction of NOx and VOC precursors occurs in conjunction with the reduction of CO_2 from fuel combustion processes, which is one of the ways of mitigating global warming.
- Off-road equipment emissions make-up a significant portion of the NOx inventory, approximately 57 tons per day.
- Government agencies may incur higher costs when contracts are awarded to certified green contracting companies that incur higher operating costs due to the purchase of cleaner equipment.
- Green contracting programs could encourage participation in incentive programs, due to the business opportunities from being a certified green contractor.
- See Chapter 8, Innovative Strategies and Programs, for additional information on this source category.

Green Contracting Programs
(Continued)

Recommendation:

- Promote the voluntary adoption of the green contracting model ordinance.
- Through incentive funding, encourage the conversion of off-road equipment fleets of companies that strive for green certification.
- Implement certification programs for green contractors.

Projected Reductions:

With recommended controls

Emissions Reduction, Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Fuel Storage and Handling (M-OTH-2)

(Fuel Storage and Handling)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
VOC	2.7	2.3	2.4	2.4	2.5	2.6	2.7	2.7

Current Control: ARB 2005 Portable Fuel Container (PFC) regulation on fuel cans

Future Control Options:

- Strengthening standards, continuing spill-proof PFC research by ARB
- Incentives to speed replacement of metal cans with cans that meet regulation

Discussion:

- Incentives will speed replacement of older, non compliant cans
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Research availability of funds for incentives to replace older gas cans, investigate feasibility as an additional program associated with the Clean Green Yard Machine electric lawn mower exchange program

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Lawn Care Equipment (M-OTH-3)

(Off-Road Equipment)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	1.1	1.0	0.9	0.9	0.9	0.9	0.9	0.9
VOC	8.5	7.5	6.7	6.4	5.9	5.4	5.2	5.0

Current Control:

- ARB regulations on new engines

Future Control Options:

- Fund replacement of lawn equipment
- More stringent EPA and ARB standards
- Reformulated gasoline/alternative fuels
- Operational efficiency enhancements
- Land use decisions/landscaping alternatives
- Enhance and expand the Indirect Source Review program

Discussion:

- The 2006 District Clean Green Yard Machine exchange program reduced smog-forming emissions by 2.24 tons by retiring 800 gas-burning mowers and providing a 60% discount on the purchase of a new cordless electric mower. The exchange program was held in 5 valley locations.
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Encourage more stringent EPA and ARB standards
- Expand programs to exchange older polluting equipment with newer, cleaner engines, electric options

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

- Reductions for this source category can be found in the ISR control measure

Off-Road Recreational Vehicles (M-OTH-4)

(Off-Road Recreational Vehicles)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	0.19	0.20	0.22	0.23	0.25	0.27	0.30	0.30
VOC	6.57	7.00	7.52	7.71	8.08	8.71	9.40	9.40

Current Control:

- ARB emissions limits and test procedures for off-highway recreational vehicles, including off-road motorcycles and ATVs.
- Use restrictions for non-compliant vehicles
- Engines 90 cc or greater, built prior to 1997 are not subject to new emission limits
- Engines 90 cc or less, built prior to 1999 are not subject to new emission limits

Future Control Options:

- Strengthen standards
- Alternative fuels
- Operational efficiency
- Fees for non-compliant vehicles

Discussion:

- Vehicles in compliance with ARB standards are issued green registration stickers that allow year-round operation. Non-compliant vehicles are eligible to receive red registrations stickers that allow operations only during designated months when ozone levels are low.
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Encourage ARB efforts to strengthen standards for new vehicles
- Develop strategy to reduce emissions from in-use recreational vehicles

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Aircraft (M-OTH-5)

(Aircraft)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	3.0	4.1	4.5	4.6	4.8	5.0	5.2	5.3
VOC	6.8	8.7	9.5	9.7	9.9	10.4	10.8	10.9

Current Control:

- Aircraft Engines: U.S.EPA works its standard-setting process through International Civil Aviation Organization because aircraft engines are international commodities and operated internationally.

Future Control Options:

- Long-term Advanced Technologies Strategy-Federal Responsibility
    - Pursue more stringent engine standards, retrofit controls, cleaner fuel, apply standards to non-tactical military aircraft
    - Control measure to limit idle and taxi time
    - Incentives for engine replacement and retrofits

Discussion:

- Proposed control options to cut emissions for new and existing aircraft would help mitigate net increase in aircraft emissions. New technology, new standards, research and development would be required. U.S. EPA has the regulatory authority over aircraft emission reductions.
- Typical idle and taxi times of aircraft averages from 13-35 minutes, in many cases much longer. Emissions range from 0-60.8 lb/hr VOC and 0 to 7.5 lb/hr of NOx during idling (varies by aircraft type)
- Incentives would facilitate earlier modernization.
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Encourage U.S. EPA to set more stringent aircraft emission standards, to require engine emission retrofits, to require the reformulation of jet fuel to lower the sulfur content, and to apply commercial aircraft engine standards to non-tactical military aircraft.
- Research technological and economic feasibility of idle and taxi control measure
- Investigate feasibility of incentives for engine replacement/retrofits.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Recreational Boats (M-OTH-6)

(Recreational Boats)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	6.14	6.01	5.65	5.56	5.40	5.26	5.18	5.14
VOC	25.92	23.80	21.97	21.50	21.70	19.87	19.14	18.43

Current Control:

- Recreational Marine engine standards for inboard and sterndrive engines- Beginning of 2007 requires 45% product sales comply with 5 g/kW-hr emission cap, 75% by 2008, and 100% 2009 and later.
- The U.S. EPA standards for outboard engines and personal watercraft, which phase in between 1998 and 2006, require a 75% HC reduction for new engines

Future Control Options:

- Strengthen standards
- Episodic control to restrict time of use in ozone season
- Alternative fuels
- Operational efficiency
- Fee on highest emitters

Discussion:

- New marine will meet the 5g/kW-hr standard through the incorporation of catalytic converters
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Encourage EPA and ARB efforts to strengthen standards
- Investigate the feasibility of episodic control, and gross polluter fees

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Ships and Commercial Boats (M-OTH-7)

(Ships and Commercial Boats)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	1.3	1.3	1.3	1.3	1.3	1.4	1.6	1.8
VOC	0.1	0.1	0.1	0.1	0.1	0.1	0.	0.1

Current Control:

- MARPOL Annex VI standards (International)
- U.S. EPA and ARB emission standards

Future Control Options:

- Voluntary measures for existing fleet
- Retrofit/replacement modernization of fleet
- Idling reduction/smart operations/"cold ironing" using port electric power
- Low sulfur regulations/rule for clean auxiliary engine fuel
- Expanded ship speed reduction
- Bring the newer/clean ships to California service
- Ship modernization-November Election: Infrastructure Bonds

Discussion:

- With limited jurisdictional authority, the District should investigate the use of incentives and funding to speed the modernization/replacement/retrofitting of ship's engines
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Support MARPOL Annex VI negotiations to develop more stringent Tier II NOx and SOx standards and to expand coverage to PM and existing engines
- Tighter U.S. EPA and ARB emission standards
- Us incentives to speed modernization and emission reductions

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Indirect Source Review (ISR) Enhancement (M-OTH-8)

(Light and medium duty vehicles, heavy-duty vehicles, and off-road equipment)

Source Category:
In terms of NOx reductions, ISR impacts three main source categories: (1) Vehicles used for commuting to and from the development project, before and after its completion; (2) Heavy-duty vehicles such as trash haulers; and (3) Off-road equipment, including street sweepers, small off-road engines (lawn equipment using IC engines-mowers, edgers, leaf blowers), and heavy-construction machinery.

Emissions Inventory:
The baseline inventory for ISR is in the three source category groups mentioned above. For further information on the baseline emissions, please refer to those individual control measure write-ups: M-TRAN-6, M-TRAN-4 & 5, M-IND-5, and M-OTH-3.

Current Control: The Indirect Source Rule, Rule 9510, is designed to mitigate emissions associated with development projects that exceed two tons per year of NOx and PM10. Specifically, for the construction phase of a development project, Rule 9510 requires a 20% NOx reduction from the statewide average resulting from the use of construction equipment that is greater than 50 horsepower. For the operational emissions, defined as the combination of the area and mobile emissions associated with the project, Rule 9510 requires 33% NOx reduction from the operational baseline, as computed using an APCO-approved model (e.g. URBEMIS). Both sources of NOx reductions can be met by on-site emission reduction measures or off-site mitigation fees.

VOC reductions are not part of the mitigation requirements of Rule 9510, since the effects of VOC emissions have been deemed as insignificant in the formation of PM2.5. However, ozone formation involves both VOC and NOx. Therefore, VOC emissions associated with development projects and its reduction through mitigation measures are now an integral part when considering Rule 9510 as a current ozone control mechanism.

Future Control Options:

- Increase the required reduction from the use of construction equipment greater than 50 horsepower from 20% to 50% NOx reduction from the statewide average.
- Increase the required reduction from the operational baseline from 33% to 50% NOx reduction.
- Add VOC reduction as a mitigation requirement.

Discussion:

- The 20% reduction from the statewide average for construction emissions was based on the assumption that it was sufficient from the point of controlling emissions in order for the District to meet its one-hour ozone plan requirements.

Indirect Source Review (ISR) Enhancement
(Continued)

- The 33% operational baseline emission reduction for NOx was based on the assumption that mobile source emissions will come down by 50% over 10 years due to improved tailpipe emissions. Instead of mitigating 100% of the remaining emissions, after deducting the emission reduction attributable to ARB's tailpipe control, Rule 9510 required only 33% mitigation. This method was used in order to assure that development projects do not over-mitigate its emissions.
- The potential NOx emission reduction from increasing the mitigation requirements from 33% to 50% reduction of the operational baseline emissions is approximately 2 tons per day.
- A future reevaluation of Rule 9510 must include analysis of VOC emissions and its reduction through mitigation requirements.

Recommendation:

- There are no specific recommendations at this time. At this point, the District is exploring all possibilities of gaining emission reductions from sources under its jurisdiction. Legal limitations in state law are also being examined.
- The District invites comments and suggestions to further improve control options, within legal limitations set by state law.
- A future feasibility study to re-evaluate this source category is planned. See Chapter 8, Innovative Strategies and Programs, for any additional information on this source category.

Projected Reductions:

With recommended controls

Emissions Reduction, Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Expanded Spare-The-Air Programs (M-OTH-9)

(Lawn-care equipment, architectural coatings and solvents, asphalt paving and roofing operations, barbecue cooking, off-road construction machinery, recreational vehicles and watercrafts, household aerosols, and other stationary sources)

Emissions Inventory:

With current controls and regulations: does not reflect the reductions from proposed controls.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Current Control: Public service announcements which encourage residents and employees to curtail activities that cause air pollution; partnerships with 700 public and private entities enable workers to participate in Spare-The-Air (STA) day activities, including receiving rewards and recognition; various outreach programs, including: clean yard machines trade-ins, air quality school curriculums, and public forums.

Future Control Options:

- Recruit more public agencies and private companies as clean air partners; add additional programs, including assisting businesses and public agencies in establishing alternative transportation programs.
- Emphasize trip reduction programs during STA days by increased public awareness campaigns and by recruiting more STA participants, of which the District currently has 700 private and public partners, who implement VMT reduction activities.
- Voluntary no-sell policy of VOC-emitting products, such as paints and solvents, during the STA days.
- Curtailment of recreational activities, such as off-road motorcycling and motorized watercraft use, during STA days.
- Postpone the use of heavy construction machinery, such as bulldozers, levelers, and pavers, to days that are less conducive to ozone formation.
- Postpone nonessential activities in stationary sources, such as structural repairs, maintenance, or painting, which result in emissions of NOx and VOC to days that are less conducive to ozone formation.

Discussion:

- The District's in-house approach to encouraging employees to curtail activities during STA days is a good model for other public and private entities to follow. During STA days, district employees take part in activities, such as: (1) Staying in for lunch, (2) Carpooling for lunch, (3) Carpooling and trip linking with fellow employees for lunchtime errands, and (4) Stepped-up efforts to use alternative transportation to and from work. The District's public education unit, which award prizes to outstanding participants, coordinates these efforts.

Expanded Spare-The-Air Programs
(Continued)

- The District's alternative transportation program gets 20% participation, wherein employees taking part use alternative transportation for three days out of a five-day workweek (60%) and get rewarded $25 for a two-week pay period. This 20% participation is approximately 8% higher than the general working population's use of alternative transportation (US Census 2000).
- Free transit rides, as done in the Bay Area during STA days, have increased ridership in buses and trains. However, these free rides have relatively very high costs in reducing vehicle miles traveled (VMT), compared to other programs that reduce VMT.
- Curtailment of activities that contribute to ozone formation will be on a voluntary basis, since the District does not have the authority to impose an outright ban on these activities. Local government entities are empowered by state law to limit certain activities, as has been done by cities in limiting usage of lawn equipment, such as leaf blowers.

Recommendation:

- Expand the District's current STA programs with the following improvements:
  - Assist public and private agencies to organize and implement alternative transportation programs.
  - Promote voluntary curtailment of activities that produce NOx and VOC.
  - Write model ordinances that prevent NOx and VOC emissions by restricting certain activities, such as use of recreational vehicles and watercraft, lawn-maintenance equipment, drive-thorough, etc. Promote the adoption of these ordinances by cities and counties, with the District providing technical and scientific assistance in subjects pertaining to air quality.
  - Explore ways to incentivize the voluntary participation of stationary sources in curtailing activities that contribute to ozone formation.
  - As a form of voluntary and emerging measures for which EPA has provided guidelines for SIP credits, design expanded STA projects so that EPA criteria for SIP creditation are fulfilled.
- See Chapter 8, Innovative Strategies and Programs, for additional information on this source category.

Projected Reductions:

With recommended controls

Emissions Reduction, Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Employer-based Trip Reduction Programs (M-TRAN-1)

(Van Pools, Carpools, Public Transit Use, Employer-based Alternative Transportation Programs, and Other Trip Reduction Programs Impacting Vehicle Miles Traveled and Targeting Light-Duty Vehicles)

Emissions Inventory:

With current controls and regulations: does not reflect the reductions from the proposed control.

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	10.2	7.8	6.3	5.8	4.8	3.7	2.9	2.4
VOC	69.5	60.4	50.2	46.8	40.5	33.3	28.1	24.4

Reflects emissions from Light-Duty Vehicles.

- EICs Affected: 710-XXX-XXXX; 722-XXX-XXXX; 723-XXX-XXXX

Current Control: Existing trip reduction programs, such as van pools and employer-based transportation trip reduction programs, exist, but are limited in scope and have not resulted in significant reductions in vehicle miles traveled (VMT).

Future Control Options:

- Organize and incentivize more participation, both private and public, in trip reduction programs.
- Emphasize trip reduction programs during Spare The Air (STA) days by increased public awareness campaigns and by recruiting more STA participants, of which the District currently has 700 private and public partners, who implement VMT reduction activities.
- Adopt a rule requiring employer-based trip reduction programs.

Discussion:

- District Rule 9001 (Commuter-based Trip Reduction) was adopted in January 20, 1994, and it was repealed in February 15, 1996, with the passage of state Senate Bill 437, which prohibited mandatory employer-based trip reduction programs.
- On February 21, 2003, an act to add Chapter 5.7 to part 3 of Division 26 of the Health and Safety Code, was enacted, and it includes Section 40601(d) which allow the District board to adopt, by the earliest feasible date, rules and regulations that require all businesses employing at least 100 people, as described further by Section 40601(d)(1 & 2), to establish rideshare programs.
- Single-occupancy vehicle commuting to work sites contributes significantly to traffic congestion and ozone formation.

Employer-Based Trip Reduction Programs
(Continued)

- High polluting cars, trucks, and vans continue to be used in worksites that are amenable to vanpooling or carpooling.

Recommendation:

- Adopt a rule requiring businesses with at least 100 employees, as defined in the CH&SC 40601, to establish rideshare programs.
- Implement trip reduction programs following EPA guidelines for SIP reductions.
- Explore the applicability of state laws governing parking pay-out programs in California, and work to strengthen that law and its enforcement in the San Joaquin Valley.
- See Chapter 8, Innovative Strategies and Programs, for additional information on this source category.

Projected Reductions:

With recommended controls

Emissions Reduction, Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	0.0	0.23	0.24	0.25	0.26	0.27	0.28
VOC	0.00	0.61	0.62	0.64	0.65	0.66	0.68

- Using the program example in the Houston-Galveston area, which assumed that 10 percent of employees would use alternative transportation one day of the week (using a 5-day workweek), work-commute VMT can be reduced by 10% x 0.2 or 2%.
- These reductions are typical of trip reduction programs, which are conservative and take into account the many challenges faced by existing programs.
- Trip reduction programs fall in the category of voluntary and emerging measures, for which EPA has provided guidance, including fulfilling criteria for claiming SIP credits, such as enforceability and verifiability.
- Surveys that gauge participation are often done to verify SIP credits.

Accelerated Fleet Turnover (M-TRAN-2)

(Light-duty, Medium-duty, Heavy-duty vehicles, and Off-road equipment)

Source Category:
This source category includes all fleets listed above.

Emissions Inventory:
The baseline inventory for accelerated fleet turnover is in the four source category groups mentioned above. For further information on the baseline emissions, please refer to those individual control measure write-ups.

Current Control:
- Emission standards for vehicle categories have steadily become more stringent, reflecting improvement brought by new technology. For heavy-duty diesel engines, the 2007 EPA standards for NOx reflect a 90% reduction (2 to 0.2 g/bhp-hr) from the 2004 EPA standards. Light and medium-duty vehicles have been subject to emission standards reflecting Lower Emission Vehicles (LEV) regulations and testing procedures, as well as greenhouse gas regulations.
- ARB's Fleet Rule For Transit Agencies reduces public exposure to diesel particulate PM and NOx emissions from transit fleet vehicles.

Future Control Options:
- Fleet average standards for public fleets and private fleets engaged in contract services to government agencies could be specified in a command-and-control rule, in order to hasten the faster turnover of older to newer vehicles. The fleet average standards reflecting the 2004 EPA standards and the 2007 EPA standards could be phase-in over a certain period of time.
- Assist in the turnover of private fleets by providing incentives for purchasing new vehicles and for improving fleet averages by retrofitting older vehicles.
- Incentive funding for inspection and maintenance programs for both types of fleets.

Discussion:
- Cleaner vehicles in all categories are now available and will have even lower NOx emissions in the years to come. However, the transition to new vehicles by attrition is not fast enough, in order for these improvements to assist in early attainment of the NAAQS standards.
- Natural gas-powered and other alternative fuel engines have been successfully integrated in existing fleets, new diesel and gas engines are approaching the emissions level of alternative-fuel engines, making "fuel neutrality" a viable path for accelerating fleet turnover.
- Diesel emission retrofit control technologies have been proven to be effective and becoming increasingly more cost-effective for both NOx and PM. NOx reduction retrofits include: diesel oxidation catalyst, lean NOx catalyst, selective catalytic reduction, NOx adsorbers, and exhaust gas recirculation. Likewise, for PM reduction, technologies are now widely available, such as: active and passive diesel particulate filters, flow-through filters, and several types of alternative diesel fuels.
- ARB's private fleet rulemaking is in progress, and formal board consideration of the upcoming rule is scheduled for mid-2007.

Accelerated Fleet Turnover
(Continued)

- South Coast fleet rules were challenged in federal court by the Engine Manufacturers Association (EMA). U.S. District Court ruled against EMA and the case was elevated to the U.S. Supreme Court, which reversed the lower court's decision. However the U.S. Supreme Court did not resolve the validity of the fleet rules and remanded the case to the lower court to consider whether some of the fleet rules could be characterized as internal state purchase decisions, thereby directing the lower court to consider the scope of EMA's challenge. The lower court concluded that the South Coast fleet rules are constitutional as they apply to state and local government actors and that they fall within the market participant doctrine.
- The South Coast AQMD issued an advisory notice based on the May 2005 lower court order. In summary, South Coast AQMD stated it would fully enforce the fleet rules as they apply to private entities under contract to state or local public entities, including the State of California, counties, cities and special districts. Note, this excludes private entities that are not under contract to state or public entities and/or federal public entities. It also excludes federal entities from fleet rule requirements.

Recommendation:

- Explore all possibilities of reducing fleet emissions in shortest time possible. Implement all viable methods including command & control rules, retrofits, & inspection & maintenance programs.
- Implement fleet modernization with "fuel neutrality" as a guiding principle.
- Use incentive funding for acceleration of private fleet turnover.
- Adopt fleet rules applicable to the following vehicle categories, as operated by public agencies or by private fleets under contract to government agencies:
  Light- and medium duty vehicles; Public transit fleets that provide passenger transportation services including intra- and intercity shuttle services; Solid waste collection fleets; Commercial airport ground access; Less polluting sweepers (PM10 and NOx); Onroad heavy-duty public fleets; Offroad construction fleets-earthmovers, pavers, levelers, water trucks, etc.; Offroad grounds keeping equipment; Other offroad equipment types operated as fleets.
- Specify exempt vehicles including emergency vehicles operated by federal, state, or local law enforcement agencies; fire departments; or to paramedic & rescue vehicles.
- The fleet requirements would be: (a) Purchase of low-emitting vehicles and equipment classified as such under ARB's certification system when purchasing or replacing vehicles and equipment and (b) Specify replacement schedule according to year of manufacture of old vehicle/equipment and the availability of replacement.
- Coordinate with ARB to implement both regulatory & incentive measures to promote consistency and effectiveness of all efforts to accelerate fleet turnovers.

Projected Reductions:

With recommended controls

Emissions Reduction, Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Diesel Trucks **(M-TRAN-3)**

(Light Heavy Duty Diesel Trucks - 1, Light Heavy Diesel Duty Trucks – 2, Medium Heavy Duty Diesel Trucks, Heavy Heavy Duty Diesel Trucks)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	225.8	198.5	162.0	150.1	127.4	100.7	83.1	72.5
VOC	13.4	11.7	9.9	9.4	8.4	7.2	6.3	5.8

Current Control:

- EPA and ARB Model Year Based Emission Standards
- Heavy-Duty Vehicle Inspection/Periodic Smoke Inspection Programs (ARB)
- ARB rules for low sulfur diesel /truck idle limits/international border trucks

Future Control Options:

- Enhanced renewable fuel standards /Alternative fuels
- Episodic controls-regulate time of use during ozone season
- No deadhead-full truck utilization
- Short Sea Shipping
- Greater use of rail for goods movement
- Port truck modernization-November Election: Infrastructure Bonds
- Augment Community Based Inspections (ARB)
- Capture and Control Vapors from Gasoline Cargo Tankers (ARB)
- Fleet Modernization: engine software upgrades, on-board diagnostics, reduced idling, on board emission controls (ARB) (SJVUAPCD)
- Encourage the use of I 5 for through travel
- International trucks must meet U.S. standards
- Green Contracting
- Enhance and expand the Indirect Source Review program

Discussion:

- Support ARB and EPA efforts to strengthen standards
- Use incentives for fleet modernization/replacement/retrofits
- Greater use of I-5 would move emissions source away from heavy population areas/Land use decisions
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Explore incentives to encourage I-5 use
- Explore opportunities for incentive funding to achieve additional emission reductions from this source category; see Chapter 7 of this Plan for additional information regarding incentive funding.

Diesel Trucks
(Continued)

- Explore Green Contracting as a way to speed fleet modernization.
- Supplement and accelerate incentives for truck stop electrification programs/auxiliary power units/ IdleAir/ direct-fired heaters and thermal storage technologies to provide power when trucks are parked.

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Gasoline Trucks (M-TRAN-4)

(Light Heavy Duty Gas Trucks - 1, Light Heavy Gas Duty Trucks – 2, Medium Heavy Duty Gas Trucks, Heavy Heavy Duty Gas Trucks)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	8.4	8.0	7.4	7.2	6.7	6.2	5.8	5.4
VOC	11.6	10.5	9.3	8.9	8.1	7.1	6.0	5.0

Current Control:

- 2008 and later model year heavy-duty gasoline engines/vehicle standards
- Fleet change-out standards
- Vehicle inspection programs; boarder inspections; truck idling programs (ARB)

Future Control Options:

- Incentives for scrappage programs; fleet modernization/engine replacement/retrofits (SJVUAPCD)
- Green contracting
- Episodic controls: restrict hours of operation during ozone season
- Enhanced renewable fuel standards /Alternative fuels
- Episodic controls-regulate time of use during ozone season
- No deadhead-full truck utilization
- Short Sea Shipping
- Greater use of rail for goods movement
- Port truck modernization-November Election: Infrastructure Bonds
- Augment Community Based Inspections (ARB)
- Capture and Control Vapors from Gasoline Cargo Tankers (ARB)
- Fleet Modernization: engine software upgrades, on-board diagnostics, reduced idling, on board emission controls (ARB) (SJVUAPCD)
- Encourage the use of I 5 for through travel
- International trucks must meet U.S. standards
- Enhance and expand the Indirect Source Review program

Discussion:

- Support ARB and EPA efforts to strengthen standards
- Incentives can be used for modernization, replacements/retrofits to assure emission reductions occur as early as possible
- Green contracting encouraged by local jurisdictions will speed fleet modernization
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Gasoline Trucks
(Continued)

- Supplement and accelerate incentives for truck stop electrification programs/auxiliary power units/ IdleAir/ direct-fired heaters and thermal storage technologies to provide power when trucks are parked

Recommendation:

- Explore wider use of incentives to encourage fleet modernization.
- Investigate feasibility of episodic control-restricted hours of operation.
- Explore opportunities for incentive funding to achieve additional emission reductions from this source category; see Chapter 7 of this Plan for additional information regarding incentive funding.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

- Reductions for this source category can be found in the ISR control measure

Heavy Duty Diesel Urban Buses (M-TRAN-5)

(Heavy Duty Diesel Urban Buses)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	2.1	2.1	2.1	2.0	2.0	1.9	1.9	1.8
VOC	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Current Control:

- 2007 and later model year heavy-duty diesel engines/vehicle standards
- Inspection/Maintenance Program

Future Control Options:

- ARB Zero-emission Bus Regulation
- Fleet change out standards
- Augment Community Based Inspections (ARB)
- Fund scrappage programs
- Incentive for faster fleet turnover/modernization
- Remote tailpipe sensing
- Episodic controls-restrict hours of use during ozone season
- Alternative fuels/add on emission controls
- Operational efficiency
- Land use decisions

Discussion:

- Support ARB and EPA efforts to strengthen standards
- Use incentives for fleet modernization/replacement/retrofits
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Supplement and accelerate incentive programs (some are already in progress) for engine replacement/retrofits to accelerate fleet modernization
- Investigate operational efficiency to maximize ridership
- Encourage land use decisions to maximize public transit

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Heavy Duty Gas Urban Buses (M-TRAN-6)

(Heavy Duty Gas Urban Buses)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
VOC	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2

Current Control:

- 2008 and later model year heavy-duty gasoline engines/vehicle standards
- Fleet change-out standards

Future Control Options:

- ARB Zero-emission Bus Regulation
- Fleet change out standards
- Augment Community Based Inspections (ARB)
- Fund scrappage programs
- Incentive for faster fleet turnover/modernization
- Remote tailpipe sensing
- Episodic controls-restrict hours of use during ozone season

Discussion:

- Support ARB and EPA efforts to strengthen standards
- Incentivize fleet modernization/replacement/retrofits
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Currently this source category is not a candidate for incentive funding, but further analysis and study is necessary to determine if this source category may garner cost effective reductions in the future provided funding sources are available. Please see Chapter 7 for any additional information.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Light and Medium Duty Vehicles (M-TRAN-7)

(Light Duty Passenger, Light Duty Trucks – 1, Light Duty Trucks – 2, Medium Duty Trucks)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	63.1	52.5	42.1	38.7	32.6	25.3	19.9	16.1
VOC	79.2	69.4	58.6	54.9	48.1	40.2	34.4	30.2

Current Control:

- LEV 1, LEV 2, and ZEV programs reduce emissions from light and medium duty vehicles
- Smog-Check Program ensures that in-use vehicles stay clean as they age.

Future Control Options:

- Replace or Upgrade Emission Control Systems on Existing Passenger Vehicles
- Improve Smog Check to increase emission reductions
- Expanded Spare-the-air Programs, to decrease VMTs.
- Incentives for voluntary vehicle retirement
- Expand use of HOV lanes
- Alternative fuels
- Carpool subsidies
- Traffic synchronization
- Fee on high emitters
- Pay as you go insurance
- Enhance and expand the Indirect Source Review program

Discussion:

- Fleet retrofits and modernization assure that emission reductions occur at the fastest rate possible.
- All methods to reduce VMT should be investigated
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Support ARB and EPA efforts to strengthen standards
- Explore opportunities for incentive funding to achieve additional emission reductions from this source category through a decrease in VMT or investigate high emission vehicle buy back/replacement program; see Chapter 7 of this Plan for additional information regarding incentive funding.

Light and Medium Duty Vehicles
(Continued)

Projected Reductions:
With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

- Reductions for this source category can be found in the ISR and Trip Reduction control measures

Motor Homes (M-TRAN-8)

(Motor Homes)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	1.1	1.1	1.1	1.0	0.9	0.8	0.7	0.6
VOC	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.1

Current Control:

- EPA and ARB Model Year Based Emission Standards
- Heavy-Duty Vehicle Inspection/Periodic Smoke Inspection Programs (ARB)

Future Control Options:

- Enhanced renewable fuel standards
- Alternative fuels
- Augment Community Based Inspections (ARB)
- Fleet Modernization: engine software upgrades, on-board diagnostics, reduced idling, on board emission controls (ARB) (SJVUAPCD)
- Encourage the use of I 5 for through travel
- Episodic controls-regulate time of use in ozone season

Discussion:

- Support ARB and EPA efforts to strengthen standards
- Use incentives for fleet modernization/replacement/retrofits
- Greater use of I-5 would move emissions source away from heavy population areas/Land use decisions
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Explore incentives to encourage I 5 use
- Expand incentive program for engine replacement/retrofits

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Motorcycles (M-TRAN-9)

(Motorcycles)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	1.2	1.3	1.2	1.2	1.2	1.2	1.3	1.3
VOC	6.0	6.0	5.2	5.1	5.0	5.0	5.0	5.1

Current Control:

- ARB emission standards implemented for 50 cubic centimeters and greater in 1978, amended in 1984 allowing standards to be set on a "corporate average". 2004 new standards set for 280 cc and larger motorcycles. Restrictions on modifications to post-1978 that increase emissions.

Future Control Options:

- Enhanced renewable fuel standards /Alternative fuels
- Episodic controls-regulate time of use during ozone season

Discussion:

- Support ARB and EPA efforts to strengthen standards
- Incentives can be used for modernization, replacements/retrofits to assure emission reductions occur as early as possible
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Currently this source category is not a candidate for incentive funding, but further analysis and study is necessary to determine if this source category may garner cost effective reductions in the future provided funding sources are available. Please see Chapter 7 for any additional information.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Other Buses (M-TRAN-10)

(Other Buses)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	0.8	0.8	0.7	0.7	0.6	0.5	0.4	0.3
VOC	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1

Current Control:

- Engine/vehicle standards depending on engine/fuel type

Future Control Options:

- ARB Zero-emission Bus Regulation
- Fleet change out standards
- Augment Community Based Inspections (ARB)
- Fund scrappage programs
- Incentive for faster fleet turnover/modernization
- Remote tailpipe sensing
- Episodic controls-restrict hours of use during ozone season
- Alternative fuels/add on emission controls
- Operational efficiency
- Land use decisions

Discussion:

- Support ARB and EPA efforts to strengthen standards
- Use incentives for fleet modernization/replacement/retrofits
- Investigate operational efficiency to maximize ridership
- Encourage land use decisions to maximize public transit
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Currently this source category is not a candidate for incentive funding, but further analysis and study is necessary to determine if this source category may garner cost effective reductions in the future provided funding sources are available. Please see Chapter 7 for any additional information.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

School Buses (M-TRAN-11)

(School Buses)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	2.1	2.3	2.3	2.3	2.3	2.2	2.1	2.0
VOC	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Current Control:

- Replacement of pre-2002 buses by 2016 (District rule 9310)
- ARB School Bus Idling Program

Future Control Options:

- Fund scrappage programs
- Fund faster fleet turnovers/modernization

Discussion:

- District Rule 9310 will accelerate the replacement schedule of the oldest buses
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- Expanded funding programs for engine replacement/retrofits to accelerate fleet modernization

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

Trains **(M-TRAN-12)**

(Trains)

Emissions Inventory:

With current controls and regulations

Tons per day – summer season

Pollutant	2005	2008	2011	2012	2014	2017	2020	2023
NOx	23.6	21.1	20.4	20.5	20.7	21.0	21.5	22.0
VOC	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6

Current Control:

- U.S. EPA has sole authority to set emission standards for new and remanufactured locomotives
- ARB -Memorandum of Understanding with BNSF and UP requires installation of ILD on over 99% of interstate locomotives between June 30, 2006 and June 30, 2008. It also requires that 80% of the diesel fuel dispensed to UP and BNSF locomotives to be low-sulfur by the end of 2006

Future Control Options:

- Funding for anti-idling devices
- Re-power
- Retrofits
- Alternative technology switch locomotives

Discussion:

- Supplementation and acceleration of incentive funding to encourage the earliest fleet modernization
- Investigate new technologies
- Please refer to Chapter 7 for any additional information on possible incentive programs which may reduce emissions from this source category.

Recommendation:

- More stringent federal emission standards
- Support agreements with the railroads to place the newest locomotives into California service
- Explore opportunities for incentive funding to achieve additional emission reductions from this source category; see Chapter 7 of this Plan for additional information regarding incentive funding.

Projected Reductions:

With recommended controls

Tons per day – summer season

Pollutant	2008	2011	2012	2014	2017	2020	2023
NOx	NQ	NQ	NQ	NQ	NQ	NQ	NQ
VOC	NQ	NQ	NQ	NQ	NQ	NQ	NQ

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