

Appendix C

Stationary and Area Source Control Strategy Evaluations

2016 PLAN FOR THE 2008 8-HOUR OZONE STANDARD

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Appendix C: Stationary and Area Source Control Strategy Evaluations

The San Joaquin Valley (Valley) faces significant challenges in meeting federal air quality standards (also called National Ambient Air Quality Standards, or NAAQS). The San Joaquin Valley Air Pollution Control District (District) has demonstrated leadership in developing and implementing groundbreaking regulatory strategies to reduce emissions. Tough and innovative rules, such as those for indirect source review, residential wood burning, glass manufacturing, and agricultural burning, have set benchmarks for California and the nation.

The District has adopted many regulatory control measures under the District's air quality attainment plans, including but not limited to the *2007 Ozone Plan*, *2008 PM_{2.5} Plan*, *2012 PM_{2.5} Plan*, *2013 Plan for the Revoked 1-Hour Ozone Standard (2013 Ozone Plan)*, and the *2015 Plan for the 1997 PM_{2.5} Standard (2015 PM_{2.5} Plan)*. District attainment plans contain commitments that serve as control measures to reduce emissions and attain the federal air quality standards. Under the U.S. Environmental Protection Agency (EPA) policy, there is a preference for reliance on control measures that have already been adopted. Table C-1 below identifies control measures the District has already adopted that are contributing to attainment of the 2008 8-hour ozone standard. These adopted District rules will continue to achieve new emissions reductions after 2012, the base year for this plan. However, it's important to note that even pre-2012 emissions reductions are contributing, and will continue to contribute, to the Valley's progress toward clean air.

Table C-1 District Rules Achieving New Emissions Reductions After 2012

<i>District Rules</i>		<i>Date Adopted or Last Amended</i>
4103	Open Burning	4/15/2010
4307	Boilers, Steam Generators, and Process Heaters 2 to 5 MMBtu/hr	5/19/2011
4308	Boilers, Steam Generators, and Process Heaters 0.075 to <2 MMBtu/hr	11/14/2013
4311	Flares	6/18/2009
4306/ 4320	Boilers, Steam Generators, and Process Heaters >5 MMBtu/hr	10/16/2008
4352	Solid Fuel Fired Boilers, Steam Generators and Process Heaters	12/15/2011
4354	Glass Melting Furnaces	5/19/2011
4565	Biosolids, Animal Manure, and Poultry Litter Operations	3/15/2007
4566	Organic Material Composting Operations	8/18/2011
4601	Architectural Coatings	12/17/2009
4605	Aerospace Assembly and Component Coating Operations	9/20/2007
4653	Adhesives and Sealants	9/16/2010
4682	Polystyrene, Polyethylene, and Polypropylene Products Manufacturing	9/20/2007

District Rules		Date Adopted or Last Amended
4684	Polyester Resin Operations	9/20/2007
4702	Internal Combustion Engines	8/18/2011
4905	Natural Gas-Fired, Fan-Type Residential Central Furnaces	1/22/2015
9610	State Implementation Plan Credit for Emission Reductions Generated Through Incentive Programs	6/20/2013

The analyses summarized in this appendix are the result of a robust and exhaustive effort on the part of the District to identify potential emission reduction opportunities. District staff from multiple departments with expertise in the applicable sectors contributed to this effort. The evaluations in this appendix capture relevant background information, examine potential emission reduction opportunities for technological and economic feasibility, and make recommendations for appropriate District actions moving forward.

CONTROL MEASURE EVALUATION METHODOLOGY

Control Measure Evaluations

Each stationary and area source control measure evaluation summarized in this appendix is organized following a thorough and consistent analysis methodology. This methodology includes sections for the following discussions and analyses:

- Emissions inventory
- Rule Description
- Regulatory evaluation of Federal, State, and local regulations, including an assessment of Reasonably Available Control Technology (RACT)
- Summary potential emission reduction opportunities identified and the associated analysis of such opportunities
- Summary of the evaluation findings.

Although this methodology is followed for each individual stationary and area source control measure evaluation, additional sections may be added as appropriate to provide a more complete summary of the analysis performed. The following is a description of the sections in the control measure analyses.

Emissions Inventory

Each control measure evaluation contains an emission inventory table that identifies the summer average emissions of oxides of nitrogen (NO_x) and volatile organic compound (VOC) for the respective control measure for multiple years between 2012, the baseline year for this plan, and 2031, the attainment year. As discussed in detail in Chapter 4, ozone is a product of atmospheric reactions involving VOCs, NO_x, the hydroxyl radical (OH), other radicals, and sunlight. As such, although some District rules control multiple

emissions including oxides of sulfur (SO_x) and particulate matter (PM), this appendix focuses on NO_x and VOC emission inventories and emission reduction opportunities.

The emissions data provided in the emission inventory table is presented as a summer average in tons of emissions per day (tpd) since ozone exceedances occur in the summer months in the Valley. Consistent with the Districts Health Risk Reduction Strategy, to ensure the emissions reductions efforts of this plan contribute to improved air quality and progress toward attainment of the 2008 8-hour ozone standard, the focus is on emissions and activities in the summer months. The data is a compilation of the data sources identified in the emission inventory appendix (see Appendix B).

Rule Description

This section of each control measure will provide a general overview of the rule, including rule applicability, types of sources subject to rule requirements, rule adoption/amendment history, and any other additional pertinent details, as relevant to the control measure evaluation.

How does the District rule compare with federal and regulations?

This section of the control measure evaluation includes a comparison of District rules to federal air quality regulations and standards. Research of federal regulations includes literature review of the following regulations and guidance documents:

- **CTG**: Control Techniques Guidelines¹
- **ACT**: Alternative Control Techniques²
- **NSPS**: New Source Performance Standards³
- **NESHAP**: National Emission Standards for Hazardous Air Pollutants⁴
- **MACT**: Maximum Achievable Control Technology⁵

How does the District rule compare with California State regulations?

Generally, state regulations are specific to mobile sources and area sources such as consumer products. However, sometimes ARB will adopt a *Suggested Control Measure* (SCM) for area sources, such as the SCM for architectural coatings promulgated in September of 2007. Additionally, there are some California Health and Safety Code (CH&SC) requirements and ARB Airborne Toxic Control Measures (ATCM)⁶ that apply to stationary and area sources. Most of the rules evaluated in this plan do not have an ARB regulation or SCM associated with their source category. The

¹ EPA. Control Techniques Guidelines. Retrieved from <http://www.epa.gov/groundlevelozone/SIPToolkit/ctgs.html>

² EPA. Alternative Control Techniques. Retrieved from <http://www.epa.gov/groundlevelozone/SIPToolkit/ctgs.html>

³ EPA. 40 CFR 60 – Standards of Performance for New Stationary Sources (NSPS). Retrieved from <http://www.tceq.state.tx.us/permitting/air/rules/federal/60/60hmpg.html>

⁴ EPA. 40 CFR 61 – National Emission Standards for Hazardous Air Pollutants (NESHAPs). Retrieved from <http://www.tceq.state.tx.us/permitting/air/rules/federal/61/61hmpg.html>

⁵ EPA. 40 CFR 63 – Maximum Achievable Control Technology (MACT). Retrieved from <http://www.tceq.state.tx.us/permitting/air/rules/federal/63/63hmpg.html>

⁶ California Air Resources Board (ARB). Airborne Toxic Control Measures (ATCMs). Retrieved from <http://www.arb.ca.gov/toxics/atcm/atcm.htm>

District has included and evaluated all relevant state guidelines identified within the applicable control measure evaluations.

How does the District rule compare to rules in other air districts?

Every control measure was compared to analogous regulations adopted by California's most progressive air districts. Investigation of control strategies and measures in other air districts and agencies includes, but is not limited to the following air districts:

- **BAAQMD:** Bay Area Air Quality Management District⁷
- **SCAQMD:** South Coast Air Quality Management District⁸
- **SMAQMD:** Sacramento Metropolitan Air Quality Management District⁹
- **VCAPCD:** Ventura County Air Pollution Control District¹⁰

In the cases where other air districts or air agencies in other states have been identified as having a more stringent analogous rule, those rules are also summarized and evaluated in this section of the control measure evaluation.

Potential Emission Reduction Opportunities

The District reviewed each control measure to identify potential opportunities for emissions reductions. The results of this review are summarized in this section of the control measure analysis. All potential emission reduction opportunities identified were evaluated for technological and economic feasibility:

- **Technological feasibility** – The technological feasibility analysis determines if a potential opportunity to reduce emissions is viable for existing facilities and operators in the Valley, given their current operating needs and restrictions. District analysis of technological feasibility includes a literature review of BACT guidelines; District permits; environmental and technological studies; EPA and ARB guideline documents; and other air districts' rules, regulations, and guidelines, to identify potential opportunities and determine the technological feasibility of any identified potential opportunities.
- **Economic feasibility** – To determine economic feasibility, a cost effectiveness analysis is conducted to evaluate the economic reasonableness of an air pollution control measure or technology as it applies to operators in the Valley. A cost effectiveness analysis examines the added cost, in dollars per year, of the control technology or technique, divided by the emissions reductions achieved, in tons per year.

⁷ Bay Area Air Quality Management District (BAAQMD). Rules and Regulations. Retrieved from <http://www.baaqmd.gov/Divisions/Planning-and-Research/Rules-and-Regulations.aspx>

⁸ South Coast Air Quality Management District (SCAQMD). Rules and Regulations. Retrieved from <http://www.aqmd.gov/home/regulations/rules/scaqmd-rule-book/table-of-contents>

⁹ Sacramento Metropolitan Air Quality Management District (SMAQMD). Rules and Regulations. Retrieved from <http://www.airquality.org/rules/>

¹⁰ Ventura County Air Pollution Control District (VCAPCD). Rules and Regulation. Retrieved from <http://www.vcapcd.org/Rulebook/RuleIndex.htm>

The District reviewed staff reports and studies from other air districts, EPA technical guidance documents, and applicable study data from the scientific community to assist in evaluating the technological and economic feasibility of potential emission reduction opportunities.

Evaluation Findings

This section includes a summary of the District's findings from the full control measure evaluation and includes any recommendations, such as a new or amended rule or further study actions. See Chapter 5 for a summary of all proposed recommendations.

The *Evaluation Findings* section also includes a brief conclusion whether the District rule under evaluation satisfies, does not satisfy, or is not subject to federal Reasonably Available Control Technology (RACT) requirements. RACT is "the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility" (44 FR 53762; September 17, 1979). Per Sections 182(b)(2) and 182(f) of the federal Clean Air Act, ozone nonattainment areas are required to implement RACT for sources that are subject to Control Techniques Guidelines (CTG) issued by EPA and for "major sources" of VOCs and NO_x, which are ozone precursors.

RACT changes over time as new technologies become feasible and cost-effective, thus making them reasonable to require. The District has conducted comprehensive reviews of all NO_x and VOC rules for compliance with federal RACT requirements. For these reviews, the District evaluates all District rules against federal rules, regulations, and technology guidelines, as well as any comparable rules and compliance methods from California's most technologically progressive air districts. In response to the District's *2009 RACT SIP* and related rule amending projects, EPA has issued federal actions documenting their approval of District rules and their concurrence that District rules are at least as stringent as RACT levels. In fact, these efforts show that many District rules are more stringent than established RACT standards. The District adopted its *2014 RACT Demonstration for the 8-Hour Ozone State Implementation Plan (2014 RACT SIP)* on June 19, 2014 to satisfy requirements for the 2008 8-hour ozone standard. The *2014 RACT SIP* analysis shows that the District continues to meet or exceed RACT for all applicable EPA source categories. The RACT evaluations in this appendix continue to build on the foundation established by these previous analyses.

C.1 RULE 4103 OPEN BURNING

C.1.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.77	0.76	0.76	0.75	0.75	0.74	0.74	0.74	0.73
VOC	0.91	0.91	0.90	0.89	0.89	0.88	0.88	0.87	0.87

C.1.2 District Rule 4103 Description

The provisions of Rule 4103 apply to open burning conducted in the Valley, with the exception of prescribed burning and hazard reduction burning, as defined in Rule 4106 (Prescribed Burning and Hazard Reduction Burning). The purpose of Rule 4103 is to permit, regulate, and coordinate the use of open burning while minimizing smoke impacts on the public.

Rule 4103 was originally adopted on June 18, 1992 and it has been amended several times to incorporate state law requirements. In 2003, California Senate Bill (SB) 705 (CH&SC Section (§) 41855.5 and 41855.6) established a schedule for specific types of agricultural material to no longer be openly burned in the field, but provided for a postponement of the phase-out where justified by technical and economic impediments. The air quality impacts from open burning in the Valley are of significant concern for the District and Valley growers; as such, Valley growers have reduced open burning through the use of sustainable agricultural practices. Those practices have contributed to a significant reduction in PM emissions since 1992.

The historical practice for disposing of agricultural materials, such as prunings and orchard removals, is to burn the materials. Burning agricultural materials provided an economically feasible method for the timely disposal of these materials, helped prevent the spread of plant diseases, and controlled weeds and pests. As part of implementing SB 705 and enhancing the effectiveness of the District's burn reduction efforts, in 2004 the District established the Smoke Management System (SMS), a more refined method of authorizing or prohibiting individual burns, based on modeled smoke impacts. Rule 4103 and the District's SMS have reduced the total acreage of agricultural materials burned in the Valley to date by more than 80% since 2002.

Agricultural Burn Reports

The most recent amendments to Rule 4103, in April 2010, incorporated the provisions of CH&SC §41855.5 and §41855.6 directly into the rule to more efficiently allow the District to consider the feasibility of non-burning alternatives for specific crops and materials. The amendments also require the District to prepare a Staff Report and Recommendations on Agricultural Burning and then to review and update once every five years to determine if there are feasible alternatives to open burning.

In 2010, the District prepared the *2010 Final Staff Report and Recommendations on Agricultural Burning (2010 Report)* which evaluated each crop category identified in CH&SC §41855.5 and provided recommendations for allowing or prohibiting the open burning of categories as outlined by the senate bill. Based upon the *2010 Report and* the lack of feasible alternatives to open burning, the ARB provided a two year concurrence on the District's recommended postponements. In 2012, the District prepared the *2012 Update: Recommendations on Agricultural Burning (2012 Report)* which re-evaluated the technological and economical impediments for the crop categories that had been postponed. Based upon the *2012 Report, and* the continued lack of feasible alternatives to open burning, the ARB provided an additional three year concurrence on the District's recommended postponements.

In 2015, the District prepared the *2015 Agricultural Burning Review (2015 Review)*, which demonstrated that in the three years since the 2012 evaluation, the availability of technologically achievable and economically feasible alternatives to agricultural burning has significantly worsened due to the severe drought conditions in the Valley and the demise of the biomass industry that historically has provided an alternative to open burning for the considerable amount of agricultural material generated in the Valley. In the *2015 Review* the District requested continued ARB concurrence for the postponement of the remaining crop categories through 2020. In December 2015, ARB granted a five-year concurrence with the assessment for limited exemptions to the phase-out of agricultural burning, consistent with requirements in the CH&SC.¹¹

Smoke Management System

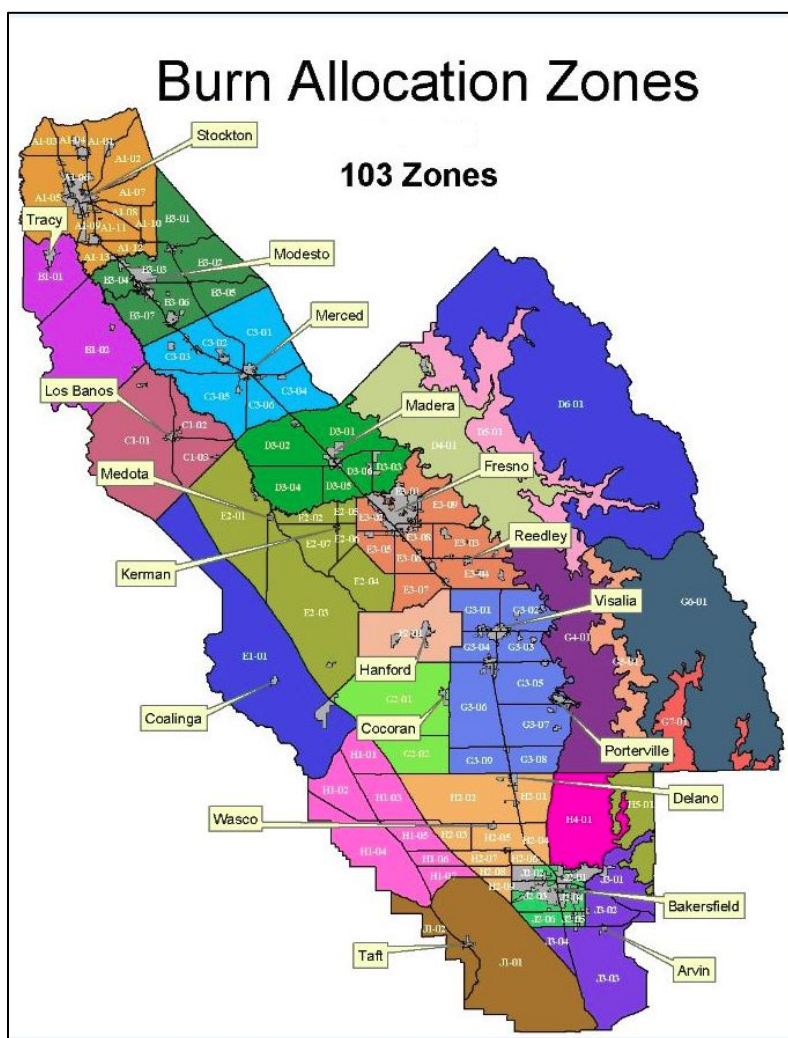
In 2004, the District established the Smoke Management System (SMS), a refined method of authorizing or prohibiting individual open burns based on modeling the air quality impacts of smoke. The entity requesting a burn permit must first provide the District with information about the acres and type of burn material, the specific location of the burn, and the date of the burn. This information is entered into the SMS, where acres are converted to tons of fuel burned using a fuel loading factor based on the specific crop to be burned. Emissions are calculated by multiplying the tons of fuel burned by a crop specific emission factor. A burn request will be authorized after analysis and review from the District Compliance staff, and only if sufficient emissions have been allocated to the burn zone.

The proper management of burning allocations under the SMS ensures that open burning of agricultural materials does not cause any violations of health-based ambient air quality standards, open burning has only been permitted under the District's comprehensive SMS, which uses real-time meteorological information to analyze the impact of burning on air quality and appropriately limit burn allocation by area.

¹¹ ARB concurrence with San Joaquin Valley Air Pollution Control District determination. Letter to Mr. Samir Sheikh from Kurt Karperos, Deputy Executive Officer of the ARB. (2015, December 23)

Under the District’s SMS program, the Valley is divided into 103 zones, see figure C-1 below. The amount of burning allowed in a given zone on a specific day is based on factors such as the local meteorology, the air quality conditions, the atmospheric holding capacity, the amount of burning already approved or happening in a given area, and the potential impacts on downwind populations. In order to avoid violations of relevant air quality standards, District staff must reduce and balance the impacts of agricultural burning, wildfires, and prescribed burning. In some cases when the wildfire smoke impacts are severe, no agricultural burning is allowed. In the summer of 2015 when wildfire smoke impacted the Valley’s air quality, the agricultural community had to be flexible to wait for the next burn window to appear. During this period, District staff worked hard to find burn windows under good to marginal dispersion conditions to allow agricultural burning to continue in the middle of the wildfire season.

Figure C-1 Agricultural Burn Zones Defined in the District SMS



Check Before You Burn Season

During the wood-burning season from November through February, the District implements even tighter open burning restrictions based on the daily residential wood-burning declarations issued for the Check Before You Burn program. With the recent amendment of Rule 4901, residential wood-burning with unregistered devices is no longer allowed when an area's forecasted PM_{2.5} concentration is expected to be greater than or equal to 20 µg/m³. This threshold is now lower compared to past years when it was set at 30 µg/m³. To be consistent with the residential wood-burning declaration, an area's burn zones in SMS are allocated zero emissions when residential wood-burning is prohibited in that area. Following similar procedures discussed above, zones directly adjacent to an area where residential wood-burning is restricted are also allocated zero emissions. Under this policy, agricultural burning is placed under tighter control during the winter season and burning is only allowed when air quality is expected to be below 20 µg/m³. This happens when meteorological conditions are projected to be conducive for pollutant dispersion, which is well below the current federal 24-hour average PM_{2.5} standard of 35 µg/m³.

Burn Prohibition Date Postponements

Through the *2010 Report*, the District made the determination, consistent with the CH&SC requirements, to postpone the burn prohibition dates and allow continued burning of certain crop categories (see table below).

Table C-2 Burn Permits Allowed for the Following Crops

Crop Category	Burn Permits Prohibited	Burn Permits Allowed
Field Crops	Alfalfa, asparagus, barley stubble, beans, corn, cotton, flower straw, hay, lemon grass, oat stubble, pea vines, peanuts, safflower, sugar cane, vegetable crops, and wheat stubble	Rice stubble up to 70% of the total acreage of rice farmed by the operator per year Residual rice stubble, spot burning of rice stubble, and burning of weeds and vegetative materials on rice field levees and banks
Prunings	Apricot crops, avocado crops, bushberry crops, cherry crops, Christmas trees, citrus crops, date crops, eucalyptus crops, kiwi crops, nectarine crops, nursery prunings, olive crops, pasture or corral trees, peach crops, persimmon crops, pistachio crops, plum crops, pluot crops, pomegranate crops, prune crops, rose crops, and fig crops	Apple crops, pear crops, and quince crops
Weed Abatement	Berms, fence rows, pasture, grass, and bermuda grass	Weed abatement activities affecting ponding and levee banks

Crop Category	Burn Permits Prohibited	Burn Permits Allowed
Orchard Removals	Orchard removal matter of more than 15 acres at a single location, per calendar year, citrus crops > 3,500 acres	Citrus crops < 3,500 acres, apple crops, pear crops, quince crops, and orchard removal matter from a total of 15 acres or less of orchard removal at a single location, per calendar year
Vineyard Removals	None at this time	Vineyard removal materials from grape and kiwi crops
Surface Harvested Prunings	Grape canes (defined as "vineyard materials"), grape vines, and prunings of almond, walnut, and pecan crops for each agricultural operation whose total nut acreage at all agricultural operation sites is 3,500 acres or more	Raisin trays (defined as "vineyard materials"), and up to 20 acres of prunings per year for almond, walnut, and pecan crops for agricultural operations whose total nut acreage at all agricultural operation sites is less than 3,500 acres with a case-by-case allowance of additional burn requests based on economic feasibility
Other Materials	Brooder paper and deceased goats	Diseased beehives

Effects of Drought on Agricultural Burning

California is currently suffering through the worst drought in recorded history. Despite improved atmospheric conditions during the winter of 2014-2015, precipitation remained well below average for most of the Valley. Snow pack levels during winter of 2014-2015 hit a record low at 6% of normal. Since January 2014, the Governor declared California to be in a state of Drought Emergency, and the entire Valley is under "exceptional" drought conditions. Federal and state surface water deliveries are at an all-time low of zero- to twenty-percent allocation, and cities and towns have implemented a mandatory 25% reduction in water usage.

The drought conditions described above have resulted in a significant increase in fallowed land, with far more expected to follow. To date hundreds of thousands of acres of orchards, vineyards and other agricultural crops have been fallowed in the San Joaquin Valley in response to the drought. Removal of agricultural material has increased significantly and is expected to continue increasing for several more years. With the biomass industry in jeopardy, the extra agricultural material has nowhere to go.

C.1.3 How does District Rule 4103 compare with federal rules and regulations?

C.1.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.1.3.2 EPA – Alternative Control Techniques (ACT) Document

EPA ACT requirements are not applicable to this source category.

C.1.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.1.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.1.4 How does District Rule 4103 compare to California State regulations?

California Health and Safety Code (CH&SC) Section (§) 41850-41866 (Agricultural Burning) is the California state regulation applicable to agricultural open burning activities.

The District has continued to work closely with the stakeholders to identify economically feasible alternatives to open burning of various agricultural materials and to meet its legal obligation under the CH&SC. To fulfill the state law requirements, the District has implemented the requirements for most crop categories identified in CH&SC §41855.5. In addition to those requirements, the state law authorizes the District to postpone the burn prohibition dates for specific types of agricultural material if the District makes three specific determinations and the Air Resources Board (ARB) concurs. The determinations are: (1) there are no economically feasible alternatives to open burning for that type of material; (2) open burning for that type of material will not cause or substantially contribute to a violation of an air quality standard; and (3) there is no long-term federal or state funding commitment for the continued operation of biomass facilities in the Valley or the development of alternatives to burning.

The District amended Rule 4103 in April 2010 to incorporate CH&SC requirements and committed the District to review its determinations for any postponed crops and materials at least once every five years. In 2010, the District also evaluated each crop category identified in CH&SC §41855.5 to determine any technologically and economically feasible alternatives to open burning. After working extensively with stakeholders to understand viable alternatives to open burning and the associated costs, the District provided recommendations for allowing or prohibiting the open burning of agricultural material categories in the District's *2010 Final Staff Report and Recommendations on Agricultural Burning*. ARB concurred with the District's determinations and recommendations; however, ARB made a one-time request that the District re-visit the 2010 findings after two years to determine if additional reductions in open burning were feasible.

The District revisited its 2010 analysis in 2012 and submitted those findings to ARB. The 2012 Report showed that in the two years since the 2010 Report, there had been no significant changes in the economic feasibility of various alternatives to agricultural burning. The amount of agricultural materials accepted at biomass facilities continued to fluctuate based on market conditions and there were no long-term federal or state funding commitments for the operation of biomass facilities or development of

alternatives to burning. EPA finalized approval for Rule 4103 on January 4, 2012 and deemed this rule as at least meeting RACT requirements.¹² The District reevaluated the availability of alternatives to open burning in the *2014 Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan (2014 RACT SIP)* and again in its *2015 Review*. Based on information provided in the *2015 Review*, ARB concurred that the limited exemptions are appropriate through 2020.

C.1.5 How does this rule compare to rules in other air districts?

C.1.5.1 Bay Area AQMD

C.1.5.1.1 Regulation 5 (Open Burning)

The requirements of Rule 4103 are more stringent than the requirements in Regulation 5. Regulation 5 was last amended on June 19, 2013 to add new fee requirements. The amendments did not implement any requirements more stringent than the current requirements in District Rule 4103.

C.1.5.2 Sacramento Metropolitan AQMD

C.1.5.2.1 Rule 407 (Open Burning)

The requirements of Rule 4103 are more stringent than the requirements in Rule 407.

C.1.5.3 South Coast AQMD

C.1.5.3.1 Rule 444 (Open Burning)

The requirements of Rule 4103 are more stringent than the requirements in Rule 444. Rule 444 was last amended on July 12, 2013 to address beach burning activities. The amendments apply to sources that do not exist within District's boundaries. Rule 444 also restricts burning on residential wood combustion curtailment days. As discussed in detail above, this is a practice that has already been implemented by the District within the Valley.

C.1.5.4 Ventura County APCD

C.1.5.4.1 Rule 56 (Open Burning)

The requirements of Rule 4103 are more stringent than the requirements in Rule 56.

¹² Revisions to the California State Implementation Plan, San Joaquin Valley Unified Air Pollution Control District, 75 Fed. Reg. 2, pp 214-217 (2012, January 4). (to be codified at 40 CFR Part 52)

C.1.6 Potential Emission Reduction Opportunities

A number of alternatives to open burning have been identified with potential to reduce emissions from this source category. Those alternatives are described in detail below and include the following:

- Biomass power plants
- Pyrolysis
- Bio-char
- Bio-oil
- High solids anaerobic digestion
- Composting
- Fiberboard
- Mulch/land application/soil incorporation
- Cellulosic ethanol production

C.1.6.1.1 Biomass Power Plants

Biomass power plants are a significant alternative to the open burning of agricultural material and the emissions associated with it. Biomass burning of agricultural material is preferable to open burning as it combusts the material more completely, results in fewer emissions, and provides an alternative source of energy in the Valley.

The biomass industry is primarily the product of the Public Utility Regulatory Policy Act (PURPA) which was enacted in 1978 at the height of the energy crisis to promote the use of alternative nonutility power generation. Today, these facilities are fully depreciated and have lost, or are nearing the ends of, their long-term contracts to sell their power to the utilities. In addition, biomass facilities are facing numerous obstacles to remain in operation including price disadvantage, demand for intermittent power instead of baseload power, and lack of federal and state funding.

Much has changed in the energy markets since PURPA was implemented. Natural gas has replaced oil for electricity generation, and supplies of natural gas have increased, driving down the wholesale cost of electricity. California has adopted a Renewable Portfolio Standard (RPS) that requires 33% of the power that is purchased by utilities be renewable. This has driven competition to fill the renewable energy needs of the state. Under the RPS, Investor Owned Utilities (IOUs) have tended to favor lower cost intermittent sources of renewable power, such as solar and wind. This has left the biomass industry in a position where the power that they produce is not desirable, since most biomass plants provide baseload power instead of intermittent power, and the current rate being paid for power does not allow them to remain viable.

Given the current energy policy, the biomass industry does not compete well under the current procurement policies of the state's IOUs. Historically, the biomass facilities have demanded 12-13 cents per kilowatt-hour, which has been necessary to retain economic viability. Pricewise, this places biomass facilities at a competitive disadvantage with other renewable fuels that can be procured at a much lower cost. Under the state's RPS, program pricing information is confidential, however, anecdotal

evidence is that currently the IOUs are purchasing power from solar and wind facilities at approximately 8 cents per kilowatt-hour.

Another factor that negatively impacts the competitive position of biomass generated power is due to the fact that such plants provide “baseload” power. As baseload generators, biomass facilities cannot produce power that can be turned on quickly, and therefore, cannot meet the power system’s demand for “ramping services”. The demand for ramping services is compounded by continued increase in the use of wind and solar renewable sources, which is partially triggered by the state’s RPS goals. If current trends persist, this issue will worsen in the future. It is estimated that by 2020, solar and wind will account for three-quarters of the state’s renewable power and 20% of the state’s total electricity supply. The net effect of this is a further transition away from baseload generators to more flexible generators that can be turned-on and turned-off when needed. Under this scenario, not only do biomass facilities have difficulty competing directly on price, but they also do not provide the type of power that is desired. While under this scenario the state can meet its renewable power goals, the potential loss of biomass plants can impact the state’s broader greenhouse gas reduction goals under AB 32 by increasing GHG emissions in sectors that currently rely on biomass plants for disposal of materials including the agricultural industry, landfills, and forests.

The biomass industry also struggles to provide consistent service to farmers needing timely removal of material to ensure the land is ready for the next planting season. In the past, lack of coordination and available storage for biomass fuels has caused uncertainty over the timing of material removal. The inability to guarantee consistent acceptance of agricultural biomass offers further confirmation that remaining crop categories should be allowed to continue open burning. A complete prohibition of open burning would result in a massive increase in agricultural material requiring disposal, placing an even greater strain on an already precarious situation.

As shown in Table C-3, since 2012, five Valley biomass facilities have shut down operations. In addition, the Valley’s largest biomass plant (Covanta Delano) has stopped receiving new material as of November 1, 2015, and has informed the District that they plan to shut down operations at the end of the year because they have been unable to secure a viable Purchase Power Agreement.

Table C-3 Status of Biomass Facilities in the Valley

Facility Name	City	Capacity (MW)	Status
Rio Bravo Fresno	Fresno	28.5	
Covanta Mendota, LP	Mendota	30.0	CLOSED Dec. 2015
Madera Power, LLC	Madera	28.5	CLOSED Feb. 2012
Ampersand Chowchilla Biomass, LLC	Chowchilla	12.5	
Merced Power. LLC	Merced	13.0	
Thermal Energy Dev Partnership, LP	Tracy	20.5	CLOSED Oct. 2014
DTE Stockton, LLC	Stockton	54.0	
Covanta Delano, Inc.	Delano	56.5	DORMANT Dec. 2015
Sierra Power Corporation	Terra Bella	9.4	CLOSED Jan. 2014

Facility Name	City	Capacity (MW)	Status
Mt. Poso Cogeneration Company, LLC	Bakersfield	49.9	
CRES Inc. d/b/a Dinuba Energy	Dinuba	11.5	CLOSED Sept. 2015

The loss of these facilities has considerably reduced the available options to dispose of agricultural wood waste, especially material from large orchard removals. As a result, many agricultural growers have lost the primary economically feasible disposal option for their orchard removal material. This could not come at a worse time as there has been an increase in the number of large orchard removals over the past year due in large part to the effects of the extreme drought emergency currently facing the state.

The biomass industry has long relied on a combination of state and federal financial incentives to directly support their relatively higher production costs. These incentives have ranged from tax credits to monetary grants, but have all expired over the last decade. Examples of these programs include the federal Renewable Electricity Production Tax Credit, expired in 2013, state Existing Renewable Facilities Program, expired in 2011, and state Biomass-to-Energy incentive Grant Program, expired in 2003. Therefore, there are currently no long-term federal or state funding commitments for the operation of biomass facilities or development of alternatives to burning.

Potential Technologies to Provide Alternatives to Agricultural Open Burning

The District has found no breakthroughs in technologically achievable and economically feasible alternatives to open burning and traditional biomass power plants. While every effort should be taken to save this existing resource, the District believes that there is an urgent need to investigate other alternatives for the disposal of agricultural waste material. The following are potential technologies that the District may pursue through the District's Technology Advancement Program. Funding from the California Energy Commission, Department of Energy, and others will also be needed.

Pyrolysis – Gasification: Pyrolysis is a possible path to convert agricultural biomass to higher value products. Pyrolysis is the heating of an organic material, such as biomass, in the absence of oxygen. It is the first step of producing a flammable gas called synthetic gas (syngas). Burning syngas offers certain advantages over directly burning biomass because the gas can be cleaned and filtered to remove problematic chemical compounds. Using syngas is also potentially more efficient than direct combustion of biomass because the gas can be combusted at higher temperatures. Syngas can also be used to produce methanol and hydrogen, or converted into a liquid fuel; with lower emissions than existing biomass combustion power plants, this is a viable alternative for farm-scale or small-scale power production. There are currently a few operational units in California, including two in the Valley.

Bio-char: Bio-char is a name for charcoal when it is used for particular purposes, especially as a soil amendment. Like charcoal, bio-char is created by pyrolysis of biomass. Bio-char can increase soil fertility and agricultural productivity. Bio-char can also be processed into activated carbon that can be used for the removal of specific compounds from gaseous and liquid streams.

Bio-oil: Bio-oil, sometimes also known as bio-crude or pyrolysis oil is a mixture of organic compounds that is distilled from the products of fast pyrolysis of biomass at about 500°C. Bio-oil can be used as fuel in boilers and also used in power generation equipment. Bio-oil also can be upgraded to renewable transportation fuels, as well. However, bio-oil with high cellulosic materials such as orchard debris is not currently commercially viable.

High Solids Anaerobic Digestion: Anaerobic digestion is a viable process that can be used to convert woody biomass, agricultural wastes, and municipal solid wastes into methane gas. Anaerobic digesters that process large amounts of woody biomass will require the use of chemical treatment or enzymes to speed the breakdown of cellulose.

Composting Biomass: Composting is the process by which organic material is broken down aerobically by bacteria and other microorganisms to form a biologically stable organic substance suitable as a soil amendment and plant fertilizer. Organic waste decomposes naturally in the presence of water, warmth, and oxygen. Composting accelerates the process by adding moisture and maintaining an elevated temperature. Biomass is one of the sources of organic material for composting operations, but woody biomass must be well mixed with high nitrogen concentration materials to be an effective compost component.

Fiberboard: Biomass can be treated and processed to produce fiberboard that can be used in the manufacture of various products. Fiberboard is a type of engineered wood product that is made out of wood fibers that are bonded together with resin. Types of fiberboard include particleboard, medium-density fiberboard, and hardboard. Fiberboard is frequently used in many industries, such as furniture production, and is generally made with waste material from wood processing facilities.

Biomass Used as Mulch/Land Application/Soil Incorporation: Chipped or shredded agricultural biomass materials can be used to produce wood mulch. Wood mulch can be a mixture of shredded wood, bark, and compost. Wood mulch can be used in landscape projects or for erosion control. The material is primarily used to reduce erosion by protecting bare soil from rainfall impacts, increasing water infiltration, and reducing runoff. A significant portion of pruned orchard material is currently shredded in-row and used as mulch in the orchard. The shredded material can be left on the ground or can be incorporated into the soil when the field is tilled. Over time, the material decomposes into the soil, which adds valuable organic material to the soil and can lead to better water infiltration and soil quality.

Cellulosic Ethanol Production: Cellulosic ethanol is an advanced next-generation biofuel that can be made from agricultural wastes, wood chips, switch grass, corn stover, forest wastes, fast-growing trees, and other plant material. Currently, ethanol produced in the United States is most commonly produced from corn kernels. In the United States, corn ethanol is primarily used as an alternative or additive to gasoline. Advanced biofuels are those that do not rely on the starch in corn kernels. Production of large quantities of ethanol from woody biomass will likely require the use of chemical treatment or

enzymes to speed the breakdown of the cellulose in the biomass. Currently, the production of cellulosic ethanol is still predominately in the demonstration phase of development.

C.1.7 Evaluation Findings

Rule 4103 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.2 RULE 4106 PRESCRIBED BURNING AND HAZARD REDUCTION BURNING

C.2.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
VOC	0.57	0.57	0.57	0.58	0.58	0.58	0.58	0.58	0.58

C.2.2 District Rule 4106 Description

Adopted in June 2001 and approved by EPA as a SIP amendment in February 2002,¹³ Rule 4106 is applicable to range improvement burning, forest management burning, wildland vegetation management burning, and hazard reduction burning within the Valley. Prescribed burning generally includes forest waste, fire hazard reduction, rangeland management, wildlife habitat improvement, and ecosystem (forest health) burning. The adoption of Rule 4106 incorporated provisions made necessary by the March 23, 2000 amendment of Title 17 of the California Code of Regulations.

Recognizing the importance of both prescribed burning and hazard reduction burning, the purpose of Rule 4106 is to permit, regulate, and coordinate the use of prescribed burning and hazard reduction burning while minimizing smoke impacts on the public. Through this rule, the District has expended considerable resources to ensure that the ignition of burn projects is only allowed when air quality and dispersion conditions are favorable, thus lessening the health impacts on Valley citizens and on air quality in the Valley.

C.2.3 How does District Rule 4106 compare with federal rules and regulations?

C.2.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.2.3.2 EPA – Alternative Control Techniques (ACT) Document

EPA ACT requirements are not applicable to this source category.

C.2.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

¹³ 67 Federal Register 39, pp. 8894-8897 (to be codified at 40 CFR Part 52). (2002, February 27). *Revisions to the California State Implementation Plan, San Joaquin Valley Unified Air Pollution Control District*. Retrieved from <https://www.federalregister.gov/articles/2002/02/27/02-4526/revisions-to-the-california-state-implementation-plan-san-joaquin-valley-unified-air-pollution>.

C.2.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.2.4 How does District Rule 4106 compare with California State regulations?

There are no state regulations applicable to this source category.

C.2.5 How does District Rule 4106 compare to rules in other air districts?

C.2.5.1 Bay Area AQMD

C.2.5.1.1 Regulation 5 (Open Burning)

The requirements in Rule 4106 are as stringent as or more stringent than those in Regulation 5.

C.2.5.2 Sacramento Metropolitan AQMD

C.2.5.2.1 Rule 501 (Agricultural Burning)

The requirements in Rule 4106 are as stringent as or more stringent than those in Rule 501.

C.2.5.3 South Coast AQMD

C.2.5.3.1 Rule 444 (Open Burning)

The requirements in Rule 4106 are as stringent as or more stringent than those in Rule 444.

C.2.5.4 Ventura County APCD

C.2.5.4.1 Rule 56 (Open Burning)

The requirements of Rule 4106 are as stringent as or more stringent than those in Rule 56.

C.2.5.5 Other Air Quality Control Agencies

C.2.5.5.1 Placer County APCD

Placer County APCD Rule 301 (Nonagricultural Burning Smoke Management)

The requirements of Rule 4106 are as stringent as or more stringent than those in Rule 301.

Placer County APCD Rule 303 (Prescribed Burning Smoke Management)

The requirements of Rule 4106 are as stringent as or more stringent than those in Rule 303.

C.2.6 Potential Emission Reduction Opportunities

In its *2015 Plan for the 1997 PM_{2.5} Standard (2015 PM_{2.5} Plan)* the District evaluated this source category to determine if there are any feasible emission reduction opportunities. This extensive evaluation included the evaluation of potential emission reduction opportunities such as the mechanical removal of materials; the use of firebox air curtain burners; reorganization of hazard reduction zones, chipping, and biomass removal programs. The District found that Rule 4106 currently has in place the most stringent measures feasible to implement in the Valley.¹⁴ The District re-evaluated the aforementioned options and has determined that no additional feasible opportunities have been developed in the last 12 months since the adoption of the *2015 PM_{2.5} Plan*. Therefore, there are no additional emission reduction opportunities at this time.

C.2.7 Evaluation Findings

According to the federal CAA §182(b)(2) and (f) this source category is not subject to federal RACT requirements because this source category has no sources subject to EPA CTGs and these sources are not “major sources” of VOCs and NO_x, as confirmed by EPA in the Technical Support Document (TSD) for the partial approval of the Districts 2009 RACT SIP.¹⁵ However, pursuant to the District’s No Stone Left Unturned philosophy, Rule 4106 was evaluated as a part of this plan development effort.

Rule 4106 currently has in place the most stringent measures feasible to implement in the Valley and therefore would meet or exceed federal RACT requirements for this source category were they applicable. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

¹⁴ SJVUAPCD. 2015 Plan for the 1997 PM_{2.5} Standard. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

¹⁵ U.S. EPA. Region IX Air Division. Technical Support Document for EPA’s Notice of Proposed Rulemaking for the California State Implementation Plan. Prepared by Stanley Tong. (2011, August 29). <https://www.regulations.gov/#!documentDetail;D=EPA-R09-OAR-2011-0723-0006>

C.3 RULE 4301 FUEL BURNING EQUIPMENT

C.3.1 Emissions Inventory (Summer Average – Tons per day)*

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
VOC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

*The emission inventory is not specific to Rule 4301. See Rules 4306, 4307, 4308, 4309, 4352, and 4703 for the individual emissions inventories.

C.3.2 District Rule 4301 Description

Rule 4301 was last amended in 1992 and applies to all types of fuel burning equipment, except air pollution control equipment. The purpose of this rule is to limit emissions of air contaminants from fuel burning equipment by specifying maximum emission rates for SOx, NOx, and PM (identified in the rule as combustion contaminant emissions). EPA finalized approval of the 1992 amendments to Rule 4301 on May 18, 1999 and deemed this rule as being at least as stringent as established RACT requirements.

Rule 4301 has a very broad applicability, as it applies to all types of fuel burning equipment. Since its early adoption in 1992, it has largely been superseded by several District rules with more stringent NOx requirements for specific types of fuel burning equipment. See the control measure evaluations for Rules 4306, 4307, 4308, 4309, 4352, and 4703 for more specific information about the individual fuel burning equipment source categories.

C.3.3 How does District Rule 4301 compare with federal rules and regulations?

C.3.3.1 EPA – Control Technique Guidelines (CTG)

Several District rules have superseded Rule 4301 with more stringent requirements. Comparisons of those District rules to the applicable federal rules are discussed within those control measure evaluations.

C.3.3.2 EPA – Alternative Control Techniques (ACT) Document

Several District rules have superseded Rule 4301 with more stringent requirements. Comparisons of those District rules to the applicable federal rules are discussed within those control measure evaluations.

C.3.3.3 Standards of Performance for New Stationary Sources (NSPS)

Several District rules have superseded Rule 4301 with more stringent requirements. Comparisons of those District rules to the applicable federal rules are discussed within those control measure evaluations.

C.3.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

Several District rules have superseded Rule 4301 with more stringent requirements. Comparisons of those District rules to the applicable federal rules are discussed within those control measure evaluations.

C.3.4 How Does District Rule 4301 compare with California State regulations?

Several District rules have superseded Rule 4301 with more stringent requirements. Comparisons of those District rules to the applicable state rules are discussed within those control measure evaluations.

C.3.5 How does District Rule 4301 compare to rules in other air districts?

C.3.5.1 Bay Area AQMD

There are no analogous rules for this source category.

C.3.5.2 Sacramento Metropolitan AQMD

There are no analogous rules in Sacramento Metro AQMD for this source category.

C.3.5.3 South Coast AQMD

C.3.5.3.1 Rule 474 (Fuel Burning Equipment—Oxides of Nitrogen)

The requirements of Rule 4301 are more stringent than the requirements in Rule 474.

C.3.5.4 Ventura County APCD

There are no analogous rules in Ventura County APCD.

C.3.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.3.7 Evaluation Findings

The NO_x requirements of this rule have been superseded by the requirements of other District rules that satisfy RACT and go beyond RACT for fuel burning equipment. All units subject to Rule 4301 are subject to a more specific NO_x rule discussed elsewhere in this appendix. See the control measure evaluations for Rules 4306, 4307, 4308, 4309, 4352, and 4703.

C.4 RULE 4302 INCINERATOR BURNING

C.4.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
VOC	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

C.4.2 District Rule 4302 Description

This rule applies to any incinerator activity or equipment. The purpose of this rule is to limit air pollution by prohibiting the use of any incinerator except for multiple-chamber incinerators or one equally effective in controlling air pollution. EPA finalized approval of the 1993 amendments to Rule 4302 on August 19, 1999 and deemed this rule as being at least as stringent as established RACT requirements: 64 FR 45170, <http://www.gpo.gov/fdsys/pkg/FR-1999-08-19/pdf/99-21164.pdf>

C.4.3 How does District Rule 4302 compare with federal rules and regulations?

C.4.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.4.3.2 EPA – Alternative Control Techniques (ACT) Document

EPA ACT requirements are not applicable to this source category.

C.4.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.4.3.3.1 NSPS - 40 CFR 60 Subpart E (Standards of Performance for Incinerators)

Rule 4302 is more stringent than the requirements in the NSPS because the NSPS exempts all facilities with less than 50 tons per day charging rate. All facilities in the Valley produce less than 50 tons per day but are still subject to Rule 4302.

C.4.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.4.4 How Does District Rule 4302 compare with California State regulations?

There are no state regulations applicable to this source category.

C.4.5 How does District Rule 4302 compare to rules in other air districts?

C.4.5.1 Bay Area AQMD

There are no analogous rules for this source category.

C.4.5.2 Sacramento Metropolitan AQMD**C.4.5.2.1 Rule 408 (Incinerator Burning)**

The requirements of Rule 4301 are as stringent as or more stringent than the requirements in Rule 408.

C.4.5.3 South Coast AQMD**C.4.5.3.1 Rule 473 (Disposal of Solid and Liquid Wastes)**

The requirements of Rule 4302 are as stringent as or more stringent than the requirements in Rule 473.

C.4.5.4 Ventura County APCD**C.4.5.4.1 Rule 57 (Incinerators)**

The requirements of Rule 4302 are more stringent than the requirements in Rule 57.

C.4.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.4.7 Evaluation Findings

Rule 4302 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.5 RULE 4306 AND RULE 4320 ADVANCED EMISSION REDUCTION OPTIONS FOR BOILERS, STEAM GENERATORS, AND PROCESS HEATERS GREATER THAN 5.0 MMBTU/HR

C.5.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	1.91	1.55	1.42	1.28	1.15	1.04	0.98	0.95	0.91
VOC	0.68	0.65	0.61	0.58	0.55	0.53	0.51	0.51	0.5

C.5.2 District Rule 4306/4320 Description

Rules 4306 and 4320 apply to any gaseous fuel or liquid fuel fired boiler, steam generator, or process heater with a total rated heat input greater than 5 million British thermal units per hour (MMBtu/hr). The purpose of these rules is to limit NOx and carbon monoxide (CO) emissions from boilers, steam generators, and process heaters of this size range.

Rule 4320 is the third generation rule for this source category. The first District rule for this source category, Rule 4305 (Boilers, Steam Generators, and Process Heaters), was adopted on December 16, 1993. Rule 4305 was superseded by Rule 4306 (Boilers, Steam Generators, and Process Heaters – Phase 3) on September 18, 2003 to implement a NOx control measure from the District's ozone and PM10 attainment plans, lowering the NOx emissions limits in Rule 4305. Since adoption, Rule 4306 has been amended twice.

The amendment of Rule 4306 in October 2008 was initially proposed to lower the NOx emission limit from 9 ppmv to 6 ppmv for units greater than 20 MMBtu/hr. It was determined that the proposed NOx limits could be accomplished by using selective catalytic reduction (SCR) or a combination of SCR and ultra-low NOx burners (ULNBs), thus making the lower limits technologically feasible. However, through the public workshop process and additional research it was also determined that most of the units subject to Rule 4306 have undergone several generations of NOx controls, and consequently, certain applications of SCR may not be cost effective and/or technological infeasible because of physical limitations. Therefore, the lower NOx limits were included in new Rule 4320 and an option was provided in the rule that allows for the payment of an annual emissions fee based on total actual emissions, rather than installation of additional NOx controls. These fees are used by the District to achieve cost effective NOx reductions through District incentive programs, the District's Technology Advancement Program, and other routes. The previous versions of Rule 4305 and 4306 combined with the implementation of Rule 4320 achieve approximately 96% control of NOx emissions from this source category.

The implementation of Rule 4320 does not substitute the requirements of Rule 4306, but enforces requirements supplementary to Rule 4306. As such, this evaluation is applicable to both Rule 4306 and Rule 4320.

Facilities with units subject to this rule represent a wide range of industries, including but not limited to electrical utilities, cogeneration, oil and gas production, petroleum refining, manufacturing and industrial processes, food and agricultural processing, and service and commercial facilities.

To recognize the operational and technical differences between different types of equipment subject to Rules 4306 and 4320, the different equipment types were separated into several major categories, with different requirements, including the following:

- Units with a total rated heat input greater than 5.0 MMBtu/hr to 20.0 MMBtu/hr
- Units with a total rated heat input greater than 20.0 MMBtu/hr
- Oilfield steam generators of all ratings and fuel types
- Refinery units of all ratings and fuel types
- Low-use units limited by a Permit to Operate to an annual heat input greater than 1.8 billion Btu/year but less than or equal to 30 billion Btu/year
- Units at a wastewater treatment facility using less than 50% PUC quality fuel
- Small specialty units operated by a small producer

C.5.3 How does District Rule 4306/4320 compare with federal rules and regulations?

C.5.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.5.3.2 EPA – Alternative Control Techniques (ACT) Document

C.5.3.2.1 ACT - EPA-453/R-93-034 (Alternative Control Techniques Document – NOx emissions from Process Heaters)

The requirements of Rules 4306/4320 are as stringent as or more stringent than the requirements in the ACT.

C.5.3.2.2 ACT - EPA-453/R-93-022 (Alternative Control Techniques Document – NOx Emissions from Industrial/Commercial/Institutional Boilers)

The requirements of Rules 4306/4320 are as stringent as or more stringent than the requirements in the ACT.

C.5.3.2.3 ACT - EPA-453/R-93-023 (Alternative Control Techniques Document – NOx Emissions from Utility Boilers)

The requirements of Rules 4306/4320 are as stringent as or more stringent than the requirements in the ACT.

C.5.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.5.3.3.1 NSPS - 40 CFR 60 Subpart D (Standards of Performance for Fossil-Fuel Fired Steam Generators for Which Construction Is Commenced After August 17, 1971)

The requirements of Rules 4306/4320 are as stringent as or more stringent than the requirements in the NSPS.

C.5.3.3.2 NSPS - 40 CFR 60 Subpart Db (Standards of Performance for Industrial- Commercial-Institutional Steam Generating Units)

The requirements of Rules 4306/4320 are as stringent as or more stringent than the requirements in the NSPS.

C.5.3.3.3 NSPS - 40 CFR 60 Subpart Dc (Standards of Performance for Small Industrial- Commercial-Institutional Steam Generating Units)

The requirements of Rules 4306/4320 are as stringent as or more stringent than the requirements in the NSPS.

C.5.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.5.3.4.1 NESHAP/MACT - 40 CFR 63 Subpart DDDDD (NESHAP for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters)

The requirements of Rules 4306/4320 are as stringent as or more stringent than the requirements in the NESHAP.

C.5.4 How Does District Rule 4306/4320 compare with California State regulations?

There are no state regulations applicable to this source category.

C.5.5 How does District Rule 4306/4320 compare to rules in other air districts?**C.5.5.1 Bay Area AQMD****C.5.5.1.1 Regulation 9 Rule 7 (Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional and Commercial Boilers, Steam Generators and Process Heaters)**

The requirements in Rules 4306/4320 are as stringent as or more stringent than those in Rule 9-7.

C.5.5.1.2 Regulation 9 Rule 10 (Nitrogen Oxides and Carbon Monoxide from Boilers, Steam Generators and Process Heaters in Petroleum Refineries)

The requirements in Rules 4306/4320 are as stringent as or more stringent than those in Rule 9-10.

C.5.5.2 Sacramento Metropolitan AQMD**C.5.5.2.1 Rule 411 (NOx from Boilers, Process Heaters and Steam Generators)**

The requirements in Rules 4306/4320 are as stringent as or more stringent than those in Rule 411.

C.5.5.3 South Coast AQMD**C.5.5.3.1 Rule 1146 (Emissions of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters)**

The requirements in Rules 4306/4320 are as stringent as or more stringent than those in Rule 1146.

C.5.5.4 Ventura County APCD**C.5.5.4.1 Rule 74.15 (Boilers, Steam Generators and Process Heaters)**

The requirements in Rules 4306/4320 are as stringent as or more stringent than those in Rule 74.15.

C.5.6 Potential Emission Reduction Opportunities

In its 2015 *PM_{2.5} Plan*, the District evaluated this source category to determine if there are any feasible emission reduction opportunities. This extensive evaluation included the evaluation of potential emission reduction opportunities such as low temperature oxidation; EMx; PM_{2.5} limits for alternative fuels; and PM potential emissions reductions from ESP and Scrubber technologies. The District evaluation determined that Rule

4306/4320 has the most stringent measures feasible to implement in the Valley.¹⁶ The District re-evaluated the aforementioned options and has determined that no additional feasible opportunities have been developed in the last 12 months since the adoption of the *2015 PM_{2.5} Plan*. Therefore, there are no additional emission reduction opportunities at this time.

C.5.7 Evaluation Findings

Rules 4306 and 4320 currently have in place the most stringent measures feasible to implement in the Valley and therefore meet or exceed federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

¹⁶ SJVUAPCD. 2015 Plan for the 1997 PM_{2.5} Standard. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

C.6 RULE 4307 BOILERS, STEAM GENERATORS AND PROCESS HEATERS–2.0 MMBTU/HR TO 5.0 MMBTU/HR

C.6.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.49	0.40	0.36	0.33	0.29	0.26	0.25	0.24	0.23
VOC	0.17	0.16	0.15	0.15	0.14	0.13	0.13	0.13	0.13

C.6.2 District Rule 4307 Description

This rule applies to any gaseous fuel or liquid fuel fired boiler, steam generator, or process heater with a total rated heat input of 2.0 million British thermal units per hour (MMBtu/hr) up to and including 5.0 MMBtu/hr. The purpose of this rule is to limit emissions of NOx, carbon monoxide (CO), sulfur dioxide (SO₂), and particulates from units subject to this rule.

Rule 4307 was adopted on December 15, 2005 to establish emissions limits and control requirements for these units which were previously exempt because of their smaller size. Since its adoption, the rule has been amended three times. The October 2008 amendments strengthened the rule by removing some exemptions, imposing NOx limits of 9 or 12 ppmv for new and replacement units, and adding a menu-approach for particulate matter control that also encompasses SOx controls. The rule was amended again in 2011 to specifically incorporate tree nut pasteurizers as a separate type of unit. EPA published a direct final approval of the 2011 amendments to Rule 4307 on February 12, 2015 and deemed this rule as being at least as stringent as established RACT requirements. NOx emissions have been controlled by over 84% for units in this source category.

Based on District permits information, there are currently 540 permitted and Permit-Exempt Equipment Registration (PEER) units subject to Rule 4307 requirements. Facilities with units subject to this rule represent a wide range of industries, including but not limited to, medical facilities, educational institutions, office buildings, prisons, military facilities, hotels, and industrial facilities.

C.6.3 How does District Rule 4307 compare with federal rules and regulations?

C.6.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.6.3.2 EPA – Alternative Control Techniques (ACT) Document

C.6.3.2.1 ACT - EPA-453/R-93-034 (Alternative Control Techniques Document-NOx Emissions from Process Heaters)

The requirements of Rule 4307 are as stringent as or more stringent than the requirements in the ACT.

C.6.3.2.2 ACT - EPA-453/R-94-022 (Alternative Control Techniques Document-NOx Emissions from Industrial/Commercial/Institutional Boilers)

The requirements of Rule 4307 are as stringent as or more stringent than the requirements in the ACT.

C.6.3.2.3 ACT - EPA-453/R-94-023 (Alternative Control Techniques Document-NOx Emissions from Utility Boilers)

The requirements of Rule 4307 are as stringent as or more stringent than the requirements in the ACT.

C.6.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.6.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.6.3.4.1 NESHAP/MACT - 40 CFR 63 Subpart DDDDD (NESHAP for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters)

The requirements of Rule 4307 are as stringent as or more stringent than the requirements in the NESHAP.

C.6.4 How Does District Rule 4307 compare with California State regulations?

There are no state regulations applicable to this source category.

C.6.5 How does District Rule 4307 compare to rules in other air districts?

C.6.5.1 Bay Area AQMD

C.6.5.1.1 Regulation 9 Rule 7 (Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters)

The requirements in Rule 4307 are as stringent as or more stringent than those in Rule 9-7.

C.6.5.1.2 Regulation 9 Rule 10 (Nitrogen Oxides and Carbon Monoxide from Boilers, Steam Generators and Process Heaters in Petroleum Refineries)

The requirements in Rule 4307 are as stringent as or more stringent than those in Rule 9-10.

C.6.5.2 Sacramento Metropolitan AQMD

C.6.5.2.1 Rule 411 (NO_x from Boilers, Process Heaters and Steam Generators)

The requirements in Rule 4307 are as stringent as or more stringent than those in Rule 411.

C.6.5.3 South Coast AQMD

C.6.5.3.1 Rule 1146.1 (Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters)

The requirements in Rule 4307 are as stringent as or more stringent than those in Rule 1146.1.

C.6.5.4 Ventura County APCD

C.6.5.4.1 Rule 74.15.1 (Boilers, Steam Generators, and Process Heaters)

The requirements in Rule 4307 are as stringent as or more stringent than those in Rule 74.15.1.

C.6.6 Potential Emission Reduction Opportunities

In its 2015 PM_{2.5} Plan, the District evaluated this source category to determine if there are any feasible emission reduction opportunities. This extensive evaluation included the evaluation of potential emission reduction opportunities such as EM_x; PM_{2.5} limits for alternative fuels; and potential emissions reductions for an ESP and scrubber. The District evaluation determined that Rule 4307 has the most stringent measures feasible to implement in the Valley.¹⁷ The District re-evaluated the aforementioned options and has determined that no additional feasible opportunities have been developed in the last 12 months since the adoption of the 2015 PM_{2.5} Plan. Therefore, there are no additional emission reduction opportunities at this time.

¹⁷ SJVUAPCD. 2015 Plan for the 1997 PM_{2.5} Standard. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

C.6.7 Evaluation Findings

Rule 4307 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.7 RULE 4308 BOILERS, STEAM GENERATORS AND PROCESS HEATERS—0.075 MMBTU/HR TO LESS THAN 2.0 MMBTU/HR

C.7.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.91	0.74	0.67	0.61	0.55	0.5	0.47	0.45	0.43
VOC	0.32	0.31	0.29	0.28	0.26	0.25	0.24	0.24	0.24

C.7.2 District Rule 4308 Description

This rule applies to any person who supplies, sells, offers for sale, installs, or solicits the installation of any boiler, steam generator, process heater or water heater with a rated heat input capacity greater than or equal to 0.075 MMBtu/hr and less than 2.0 MMBtu/hr. The purpose of this rule is to limit NOx and carbon monoxide (CO) emissions from units within this source category. As a point of sale rule, Rule 4308 achieves emissions reductions as units subject to the rule are replaced over time. This rule has resulted in more than 93% control of emissions from this source category.

Rule 4308 was adopted on October 20, 2005 to establish NOx emissions limits for these units which were previously exempt from District regulations because of their small size. The rule was amended in December 2009 to lower the NOx emissions limits to 20 ppmv for units fired on natural gas, with the exception of instantaneous water heaters and pool heaters greater than or equal to 0.075 MMBtu/hr but less than or equal to 0.4 MMBtu/hr. In 2013, the District determined that a 20 ppmv limit was now technologically feasible and cost effective for instantaneous water heaters 0.075 MMBtu/hr to 0.4 MMBtu/hr; as such, that emission limit was lowered during the November 2013 amendment of Rule 4308. EPA published a direct final approval the 2013 amendments to Rule 4308 on February 12, 2015.

Units subject to Rule 4308 are used in settings including, but not limited to, apartment buildings, large homes, small businesses, commercial buildings, manufacturing facilities, government facilities, restaurants, hotels, hospitals, educational institutions, and religious organizations. Affected persons include water heater manufacturers, plumbing wholesalers, supply stores, plumbers, contractors, and end-users. This point-of-sale approach allows the District to achieve NOx emission reductions without forcing immediate replacement of existing units to comply with rule requirements and thus placing an undo financial burden on the consumer.

C.7.3 How does District Rule 4308 compare with federal rules and regulations?

C.7.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.7.3.2 EPA – Alternative Control Techniques (ACT) Document**C.7.3.2.1 ACT - EPA–453/R-93-034 (Alternative Control Techniques Document—NO_x Emissions from Process Heaters)**

The requirements of Rule 4308 are as stringent as or more stringent than the requirements in the ACT.

C.7.3.2.2 ACT - EPA–453/R-94-022 (Alternative Control Techniques Document—NO_x Emissions from Industrial/Commercial/ Institutional Boilers)

The requirements of Rule 4308 are as stringent as or more stringent than the requirements in the ACT.

C.7.3.2.3 ACT - EPA–453/R-94-023 (Alternative Control Techniques Document—NO_x Emissions from Utility Boilers)

The requirements of Rule 4308 are as stringent as or more stringent than the requirements in the ACT.

C.7.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.7.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.7.4 How Does District Rule 4308 compare with California State regulations?

There are no state regulations that apply to this source category.

C.7.5 How does District Rule 4308 compare to rules in other air districts?**C.7.5.1 Bay Area AQMD****C.7.5.1.1 Regulation 9 Rule 6 (Nitrogen Oxides Emissions from Natural Gas-Fired Boilers and Water Heaters)**

The requirements in Rule 4308 are as stringent as or more stringent than those in Rule 9-6.

C.7.5.1.2 Regulation 9 Rule 7 (Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters)

The requirements in Rule 4308 are as stringent as or more stringent than those in Rule 9-7.

C.7.5.2 Sacramento Metropolitan AQMD

C.7.5.2.1 Rule 411 (NOx from Boilers, Process Heaters and Steam Generators)

The requirements in Rule 4308 are as stringent as or more stringent than those in Rule 411.

C.7.5.2.2 Rule 414 (Water Heaters, Boilers and Process Heaters Rated Less Than 1,000,000 Btu per Hour)

The requirements in Rule 4308 are as stringent as or more stringent than those in Rule 414.

C.7.5.3 South Coast AQMD

C.7.5.3.1 Rule 1146.2 (Emissions of Oxides of Nitrogen From Large Water Heaters and Small Boilers and Process Heaters)

The requirements in Rule 4308 are as stringent as or more stringent than those in Rule 1146.2.

C.7.5.4 Ventura County APCD

C.7.5.4.1 Rule 74.11.1 (Large Water Heaters and Small Boilers)

The requirements in Rule 4308 are as stringent as or more stringent than those in Rule 74.11.1.

C.7.5.4.2 Rule 74.15.1 (Boilers, Steam Generators, and Process Heaters)

VCAPCD Rule 74.15.1 was amended on June 23, 2015 to implement new NOx emission limits for new and replacement units outside of the applicability of this rule. The requirements in Rule 4308 are as stringent as or more stringent than those in Rule 74.15.1.

C.7.5.5 Other Air Quality Control Agencies

C.7.5.5.1 Placer County APCD (PCAPCD) – Rule 247 (Natural Gas-Fired Water Heaters, Small Boilers and Process Heaters)

The requirements in Rule 4308 are as stringent as or more stringent than those in Rule 247.

C.7.6 Potential Emission Reduction Opportunities

In its *2015 PM_{2.5} Plan*, the District evaluated this source category to determine if there are any feasible emission reduction opportunities. This extensive effort included an evaluation of the rule exemptions for units in mobile homes and in recreational vehicles. The District evaluation determined that Rule 4308 has the most stringent measures feasible to implement in the Valley.¹⁸ The District re-evaluated the aforementioned options and has determined that no additional feasible opportunities have been developed in the last 12 months since the adoption of the *2015 PM_{2.5} Plan*. Therefore, there are no additional emission reduction opportunities at this time.

C.7.7 Evaluation Findings

Rule 4308 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

¹⁸ SJVUAPCD. 2015 Plan for the 1997 PM_{2.5} Standard. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

C.8 RULE 4309 DRYERS, DEHYDRATORS, AND OVENS

C.8.1.1.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.22	0.24	0.26	0.28	0.29	0.31	0.32	0.33	0.34
VOC	0.20	0.21	0.23	0.25	0.26	0.27	0.28	0.29	0.29

C.8.2 District Rule 4309 Description

Rule 4309 is applicable to any dryer, dehydrator, or oven that is fired on gaseous fuel, liquid fuel, or is fired on gaseous and liquid fuel sequentially, and the total rated heat input for the unit is 5.0 million British thermal units per hour (5.0 MMBtu/hr) or greater. The purpose of this rule is to limit NOx and carbon monoxide (CO) emissions from these units, which result from the combustion of fuel in the burners. The rule enforces NOx emission limits between 3.5-12 ppmv for four categories of equipment, achieving approximately 34% control of total NOx emissions.

Rule 4309 was adopted on December 15, 2005 and has not been amended. EPA finalized approval of Rule 4309 on May 30, 2007 and deemed this rule as being at least as stringent as established RACT requirements.

Dryers, dehydrators, and ovens are utilized in a broad range of industries. Analyses performed for the rule adoption separated the unit types into four broad industry groups: dehydrators; asphalt/concrete; milk, cheese, and other dairy processing; and other. Dryers, dehydrators, and ovens currently operate either seasonally or year-round depending on the industry and the unit's purpose within the process. There are 126 units subject to this rule, ranging in size from 5.0 MMBtu/hr to 200 MMBtu/hr.

C.8.3 How does District Rule 4309 compare with federal rules and regulations?

C.8.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.8.3.2 EPA – Alternative Control Technology (ACT)

C.8.3.2.1 ACT - EPA – 453/R-94-004 (Alternative Control Techniques Document–NOx Emissions from Cement Manufacturing)

The requirements of Rule 4309 are as stringent as or more stringent than the requirements in the ACT.

C.8.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.8.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.8.4 How does District Rule 4309 compare with California State regulations?

There are no state regulations applicable to this source category.

C.8.5 How does District Rule 4309 compare to regulations from other air districts?**C.8.5.1 Bay Area AQMD**

There are no analogous rules for this source category.

C.8.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.8.5.3 South Coast AQMD**C.8.5.3.1 Rule 1147 (NO_x Reductions from Miscellaneous Sources)**

The requirements of Rule 4309 are as stringent as or more stringent than the requirements in Rule 1147.

C.8.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.8.6 Potential Emission Reduction Opportunities

In its *2015 PM_{2.5} Plan*, the District evaluated this source category to determine if there are any feasible emission reduction opportunities. This extensive effort included an evaluation of asphalt plants; dehydrators; and dryers. The District evaluation determined that Rule 4309 has the most stringent measures feasible to implement in the Valley.¹⁹ The District re-evaluated the aforementioned options and has determined that no additional feasible opportunities have been developed in the last 12 months since the adoption of the *2015 PM_{2.5} Plan*. Therefore, there are no additional emission reduction opportunities at this time.

¹⁹ SJVUAPCD. 2015 Plan for the 1997 PM_{2.5} Standard. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

C.8.7 Evaluation Findings

Rule 4309 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.9 RULE 4311 FLARES

C.9.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.57	0.56	0.55	0.54	0.54	0.53	0.53	0.53	0.52
VOC	1.64	1.54	1.45	1.37	1.29	1.21	1.17	1.14	1.12

C.9.2 District Rule 4311 Description

Rule 4311 was adopted in June 2002 to establish flaring requirements and reduce VOC, NOx, and SOx emissions from operations involving the use of flares, with the exception of a limited list of sources identified in the rule. Amendments were adopted on June 15, 2006 and June 18, 2009. The September 2009 amendment incorporated requirements for flare minimization plans and increased the stringency of existing requirements for sulfur emissions.

Flaring is a high temperature oxidation process used to burn combustible components, primarily hydrocarbons, of waste gases from industrial operations, primarily for the purpose of controlling emissions and as a safety device. The majority of waste gases flared are natural gas, propane, ethylene, propylene, butadiene and butane.

Combustion efficiency depends on flame temperature, residence time in the combustion zone, vent gas flammability, auto ignition temperature, heating value, and turbulent mixing. When operated at an optimal combination of these factors, flares have a destruction efficiency of 98 percent or greater. Complete combustion converts all VOCs to CO₂ and water; however incomplete combustion generates air pollutants such as NOx, sulfur dioxide, carbon monoxide, and particulate matter. Additionally, there is a possibility of release of hydrocarbons if they have not been completely combusted. To prevent the creation of smoke or soot, which is influenced by fuel characteristics and the amount and distribution of oxygen in the combustion zone, most industrial flares are steam-assisted or air-assisted. In some cases, another fuel must be added to flare gas to achieve the minimum heating value of 200-250 Btu/ft³ required for complete combustion.

There are two general types of flares: open and enclosed flares. Flares are further categorized by the height of the flare tip, and by the method of enhancing combustion by mixing at the flare tip (i.e., steam-assisted, air-assisted, pressure assisted, or non-assisted).

Ground flares, which are not typically found in the Valley, vary in complexity and can consist of either conventional flare burners discharging horizontally with no enclosures or multiple burners in refractory-lined steel enclosures.

Flaring in the San Joaquin Valley

Flares serve two basic functions: as a safety device during unforeseeable and unpreventable emergency situations/standby situations and less commonly as a primary emissions control device for VOC emissions. As safety devices, flares are necessary to prevent catastrophic consequences such as the release of toxic gases and explosions, which could result in loss of property, injury, and loss of human life. In the Valley, the vast majority of flares are employed as emergency/standby control devices, which is in direct contrast with other regions, such as North Dakota, where flares are used for primary disposal of waste gas from oil and natural gas production. Also, while regions like North Dakota utilize flares to combust associated gas during the initial extraction phase of the production process (i.e., directly from the well), Valley flares are typically used further down the process chain, primarily as a safety device associated with gas collection systems, resulting in far lower quantities of flared gas.

Valley operators have generally evaluated all feasible and cost effective options for handling and disposing of the associated/waste gases generated by their facilities and installing a flare as the primary method of disposal would be the last resort. In addition to Rule 4311 requirements to evaluate and implement all feasible measures to reduce flaring activities, other associated rules also implement stringent capture and control of these gases. Therefore, most facilities have made significant investments to capture and utilize these process gases in a variety of methods and this ability has allowed facilities to maximize income generation. Some capture and treat these gases and sell them to natural gas/utility providers (generates monetary income), while others utilize these gases on-site to fuel equipment that generates electricity and/or provides process heating (saves fuel costs). In fact, most Valley facilities regard flaring events as a significant monetary cost, through directly lost profits or increased fuel costs.

In the District's evaluation of Valley flaring activities,²⁰ nearly all of the flaring events were either one-time events due to new control equipment installation or maintenance of existing equipment, and therefore not repeated, or in response to emergency situations or process upsets. For example, one Valley facility (light oil production facility) experienced abnormally high flaring due to the sales transmission pipeline being offline for repairs. Another facility (wastewater treatment plant) normally uses the fuel onsite to produce electricity and process heating but could not do so because additional air pollution control devices were being installed.

Flares in the Valley subject to the requirements in Rule 4311 are employed by a diverse group of industries for a wide variety of applications, as illustrated by the below list. In contrast, other air districts' flare rules generally limit the applicability of their rules to petroleum production facilities or refineries.

- Gas plants
- Heavy oil production/ thermally enhanced oil recovery

²⁰ SJVAPCD. (2014). *Rule 4311 (Flares) Further Study*. Retrieved February 3, 2015 from: http://valleyair.org/Air_Quality_Plans/docs/R4311.pdf.

- Light oil production
- Refinery operations
- Wastewater treatment plants
- Cheese production
- Wine
- Dairy operations
- Flat glass production
- Correctional facility

C.9.3 *How does District Rule 4311 compare with federal rules and regulations?*

C.9.3.1 *EPA – Control Technique Guidelines (CTG)*

EPA CTG requirements are not applicable to this source category.

C.9.3.2 *EPA – Alternative Control Technology (ACT)*

EPA ACT requirements are not applicable to this source category.

C.9.3.3 *Standards of Performance for New Stationary Sources (NSPS)*

C.9.3.3.1 *NSPS - 40 CFR 60.18 (General Control Device and Work Practice Requirements)*

The requirements of Rule 4311 are as stringent as or more stringent than the requirements in the NSPS.

C.9.3.3.2 *NSPS - 40 CFR 65.147 (Flares)*

The requirements of Rule 4311 are as stringent as or more stringent than the requirements in the NSPS.

C.9.3.3.3 *NSPS - 40 CFR 60 Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution)*

The requirements of Rule 4311 are as stringent as or more stringent than the requirements in the NSPS.

C.9.3.3.4 *NSPS - 40 CFR 60 Subpart Ja (Standards of Performance for Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After May 14, 2007)*

The requirements of Rule 4311 are as stringent as or more stringent than the requirements in the NSPS.

C.9.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.9.3.4.1 NESHAP/MACT - 40 CFR 63 Subpart SS (National Emission Standards for Closed Vent Systems, Control Devices, Recovery Devices and Routing to a Fuel Gas System or a Process)

The requirements of Rule 4311 are as stringent as or more stringent than the requirements in the NESHAP.

C.9.4 How does District Rule 4311 compare with California State regulations?

There are no state regulations applicable to this source category.

C.9.5 How does District Rule 4311 compare to regulations from other air districts?

The table below compares major elements of Rule 4311 with the rules in the Bay Area, South Coast, and Ventura County air districts.

C.9.5.1 Bay Area AQMD

C.9.5.1.1 Regulation 12 Rule 11 (Flare Monitoring at Petroleum Refineries)

The requirements in Rule 4311 are as stringent as or more stringent than those in Rule 12-11.

C.9.5.1.2 Regulation 12 Rule 12 (Flares at Petroleum Refineries)

The requirements in Rule 4311 are as stringent as or more stringent than those in Rule 12-12.

C.9.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.9.5.3 South Coast AQMD

C.9.5.3.1 Rule 1118 (Control of Emissions from Refinery Flares)

The requirements in Rule 4311 are as stringent as or more stringent than those in Rule 1118.

C.9.5.4 Ventura County APCD

C.9.5.4.1 Rule 54 (Sulfur Compounds)

The requirements in Rule 4311 are as stringent as or more stringent than those in Rule 54.

C.9.5.5 Other Air Quality Control Agencies

C.9.5.5.1 Santa Barbara County Air Pollution Control District (SBCAPCD) Rule 359 (Flares and Thermal Oxidizers)²¹

Rule 4311 is as stringent as or more stringent than those in Rule 359, as demonstrated in the extensive analysis presented in the District's *2015 PM2.5 Plan*.²²

C.9.5.5.2 State of North Dakota Century Code 38-08-06.4²³ - Industrial Commission Order²⁴

Rule 4311 is as stringent as or more stringent than those in the South Dakota Rule, as demonstrated in the extensive analysis presented in the District's *2015 PM2.5 Plan*.²⁵

Potential Emission Reduction Opportunities

Flaring activities in the Valley emit 0.57 tpd of NO_x emissions, representing 0.17% of the summer average NO_x emissions in the Valley. Despite this relatively small amount of emissions, in keeping with its leave no stone unturned approach; the District has invested significant resources into evaluating potential emissions reductions opportunities from flares. In fact, after determining that the rule implements the most stringent measures feasible to implement in the Valley, in its *2015 PM2.5 Plan*, the District committed to perform another flare further study to continue to seek out additional emission reduction opportunities. The further study reports are available on the District's website at http://www.valleyair.org/Air_Quality_Plans/PM_Plans.htm.

C.9.6 Evaluation Findings

As demonstrated above, District Rule 4311 meets RACT requirements, and has also been demonstrated as implementing Most Stringent Measures.²⁶ As a commitment included in the District's *2015 Plan for the 1997 PM2.5 Standard (2015 PM2.5 Plan)*, District staff conducted a further study to review additional emission reduction opportunities under Rule 4311 and reached the following findings:

1. Even though operators of flares in the Valley have already taken extensive measures to reduce flaring through Rule 4311, additional minimization practices

²¹ Santa Barbara County Air Pollution Control District. (1994, June 28). *Rule 359 Flares and Thermal Oxidizers*. Retrieved February 13, 2015 from <http://www.ourair.org/wp-content/uploads/rule359.pdf>.

²² SJVUAPCD. *2015 Plan for the 1997 PM2.5 Standard*. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

²³ North Dakota Legislative Branch. (2013, August). *Century Code 38-08-06.4 Flaring of Gas Restricted – Imposition of Tax – Payment of Royalties – Industrial Commission Authority*. Retrieved February 13, 2015 from <http://www.legis.nd.gov/cencode/t38c08.pdf?20150213153521>.

²⁴ North Dakota Industrial Commission. (2014, July 1). *Order of the Commission*. Obtained February 3, 2015 from <https://www.dmr.nd.gov/oilgas/or24665.pdf>.

²⁵ SJVUAPCD. *2015 Plan for the 1997 PM2.5 Standard*. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

²⁶ SJVUAPCD. *2015 Plan for the 1997 PM2.5 Standard*. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

currently performed at some facilities may have the potential to be utilized at other facilities to further reduce flaring activities and emissions.

2. Ultra-low NO_x technologies with the potential to further reduce emissions from flaring have recently become available and should be potentially required through future rule amendments where technologically achievable and economically feasible.

Given the enormity of reductions needed to develop plans that demonstrate attainment with the latest federal ozone and PM_{2.5} standards and based on findings from the recent flare further study, the District commits to working closely with affected operators to undergo a regulatory amendment process for Rule 4311 as follows:

1. District commits to amend Rule 4311 to include additional ultra-low NO_x flare emission limitations for existing and new flaring activities at Valley facilities to the extent that such controls are technologically achievable and economically feasible, by December 31, 2017.
2. District commits to amend Rule 4311 to include additional flare minimization requirements to the extent that such controls are technologically achievable and economically feasible, by December 31, 2017.

C.10 RULE 4313 LIME KILNS

C.10.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	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	0.00

The emissions inventory for the lime kiln source category is 0.00 tons per day because there are no lime kilns in operation in the Valley

C.10.2 District Rule 4313 Description

Rule 4313 was adopted in 2003 to limit NOx emissions from the operation of lime kilns. Lime kilns can be used in a variety of manufacturing and processing operations, including food and agriculture. EPA approved District Rule 4313 on September 4, 2003 and deemed this rule as being at least as stringent as established RACT requirements. There are currently no lime kilns operating in the Valley. At the time of rule adoption, there were a total of three lime kilns in operation in the Valley. These lime kilns were operated at two sugar processing plants; however, these plants have been non-operational since 2008. If any lime kilns were to begin operation in the Valley in the future it would be required to meet District BACT requirements, per District Rule 2201 (New and Modified Stationary Source Review Rule). There are no lime kilns currently going through the District's permitting process to become operational in the Valley, nor are any lime kilns expected to be operated in the Valley in the future.

C.10.3 How does District Rule 4313 compare with federal rules and regulations?

C.10.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.10.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.10.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.10.3.3.1 NSPS - 40 CFR 60 Subpart HH (Standards of Performance for Lime Manufacturing Plants)

The provisions of this subpart are applicable to each rotary lime kiln used in the manufacturing of lime. However, this subpart only has requirements for the particulate matter (PM) emissions from the rotary lime kilns. The purpose of this analysis is to

evaluate this source for NO_x and VOC emission reduction opportunities, and is not applicable to this evaluation.

C.10.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.10.3.4.1 NESHAP - 40 CFR 63 Subpart AAAAA (National Emission Standards for Hazardous Air Pollutants for Lime Manufacturing Plants)

The provisions of this NESHAP are applicable to each rotary lime kiln used in the manufacturing of lime. However, this NESHAP only has requirements for the PM emissions from the rotary lime kilns. The purpose of this analysis is to evaluate NO_x and VOC emission reduction opportunities.

C.10.4 How does District Rule 4313 compare with California State regulations?

There are no state regulations applicable to this source category.

C.10.5 How does District Rule 4313 compare to regulations from other air districts?

C.10.5.1 Bay Area AQMD

Bay Area AQMD has no analogous rules for this source category.

C.10.5.2 Sacramento Metro AQMD

Sacramento Metro AQMD has no analogous rules for this source category.

C.10.5.3 South Coast AQMD

South Coast AQMD has no analogous rules for this source category.

C.10.5.4 Ventura County APCD

Ventura County APCD has no analogous rules for this source category.

C.10.6 Potential Emission Reduction Opportunities

There are no emission reduction opportunities from lime kilns in the Valley.

C.10.7 Evaluation Findings

There are no lime kilns in operation in the Valley, nor are any expected to be operated in the Valley in the future. However, if any lime kilns were to begin operating in the Valley, it would be required to meet District BACT requirements, which by definition are beyond RACT. As such, Rule 4313 meets or exceeds federal RACT requirements for this source category.

C.11 RULE 4352 SOLID FUEL FIRED BOILERS, STEAM GENERATORS, AND PROCESS HEATERS

C.11.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	2.97	3.27	3.59	3.78	3.95	4.12	4.24	4.27	4.32
VOC	0.08	0.09	0.11	0.12	0.12	0.13	0.13	0.13	0.13

C.11.2 District Rule 4352 Description

The purpose of Rule 4352 is to limit NOx and carbon monoxide (CO) emissions from any boiler, steam generator or process heater fired on solid fuel. Prior to September 14, 1994 solid fuel fired units were exempt from the requirements of District Rule 4305. The adoption of Rule 4352 established NOx limits of 200 parts per million by volume (ppmv) for municipal solid waste facilities (MSW), 0.35 pounds per million British thermal units per hour (lb/MMBtu) for biomass facilities, and 0.20 lb/MMBtu for all other solid fuel fired units. Since its adoption, the rule has been amended three times. The December 2011 amendments strengthened the rule by lowering NOx emissions limits for all three source categories. However, no emissions reductions were quantified because the rule amendments were meant to satisfy EPA RACT requirements and all units were determined to be operating at the new emission limits. EPA finalized approval of Rule 4352 on November 6, 2012 and deemed this rule as being at least as stringent as established RACT requirements.

While previous rule-amending projects for Rule 4352 have not quantified specific emissions reductions, the use of biomass facilities in the Valley has fostered emissions reductions. As an energy source, biomass can either be used directly or converted into other energy products such as biofuel. Biomass facilities in the Valley reduce the amount of pollutants created by open burning practices and the landfilling of potential biofuels such as agricultural materials, and urban and forest wood waste products by utilizing these materials. The District has reduced the total acreage of agricultural materials burned in the Valley to date by more than 80%.

Boilers, steam generators, and process heaters are used in a broad range of industrial, commercial, and institutional settings. Units subject to this rule fire on a variety of solid fuels: coal, petroleum coke, biomass, tire-derived fuel, and MSW. Although the output from units subject to the rule could be utilized in many settings, all of the operators within the Valley use the units' output to generate electricity.

The two primary methods of controlling NOx emissions from boilers, steam generators, and process heaters are either to change the combustion parameters to reduce NOx formation (i.e., combustion modification) or to treat the NOx formed in the process before the NOx is emitted into the atmosphere (i.e., post-combustion control or flue gas treatment).

C.11.3 How does District Rule 4352 compare with federal rules and regulations?

C.11.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.11.3.2 EPA – Alternative Control Technology (ACT)

C.11.3.2.1 ACT - EPA–453/R-94-022 (Alternative Control Techniques Document–NOx Emissions from Industrial/Commercial/ Institutional Boilers)

The requirements of Rule 4352 are as stringent as or more stringent than the requirements in the ACT.

C.11.3.2.2 ACT - EPA – 453/R-94-023 (Alternative Control Techniques Document– NOx Emissions from Utility Boilers)

The requirements of Rule 4352 are as stringent as or more stringent than the requirements in the ACT.

C.11.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.11.3.3.1 NSPS - 40 CFR 60 Subpart Cb (Emission Guidelines and Compliance Times for Municipal Waste Combustors that are Constructed on or before December 19, 1995)

The requirements of Rule 4352 are as stringent as or more stringent than the requirements in the NSPS.

C.11.3.3.2 NSPS - 40 CFR 60 Subpart D (Standards of Performance for Fossil-Fuel-Fired Steam Generators for which Construction is Commenced after August 17, 1971)

The requirements of Rule 4352 are as stringent as or more stringent than the requirements in the NSPS.

C.11.3.3.3 NSPS - 40 CFR 60 Subpart Db (Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units)

The requirements of Rule 4352 are as stringent as or more stringent than the requirements in the NSPS.

C.11.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.11.3.4.1 NESHAP - 40 CFR 63 Subpart DDDDD (NESHAP for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters)

40 CFR 63 Subpart DDDDD was amended on January 31, 2013 to include new emission limits for PM, CO, and total selective metals (TSM), replace numeric dioxin emission limits with work practice standards, add new subcategories of facilities, and add alternative monitoring approaches. The District evaluated the requirements contained within this NESHAP. The requirements of Rule 4352 are as stringent as or more stringent than the requirements in the NESHAP.

C.11.4 How does District Rule 4352 compare with California State regulations?

There are no state regulations applicable to this source category.

C.11.5 How does District Rule 4352 compare to regulations from other air districts?

C.11.5.1 Bay Area AQMD

C.11.5.1.1 Regulation 9 Rule 7 (Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters)

The requirements in Rule 4352 are as stringent as or more stringent than those in Rule 9-7.

C.11.5.1.2 Regulation 9 Rule 11 (Nitrogen Oxides and Carbon Monoxide from Electric Power Generating Steam Boilers)

The requirements in Rule 4352 are as stringent as or more stringent than those in Rule 9-11.

C.11.5.2 Sacramento Metro AQMD

C.11.5.2.1 Rule 411 (NO_x from Boilers, Process Heaters, and Steam Generators)

The requirements in Rule 4352 are as stringent as or more stringent than those in Rule 411.

C.11.5.3 South Coast AQMD

C.11.5.3.1 Rule 1146 (Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters)

The requirements in Rule 4352 are as stringent as or more stringent than those in Rule 1146.

C.11.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.11.6 Potential Emission Reduction Opportunities

In its *2015 Plan for the 1997 PM_{2.5} Standard (2015 PM_{2.5} Plan)* the District evaluated this source category to determine if there are any feasible emission reduction opportunities. This extensive effort included the evaluation of potential emission reduction opportunities such as long term solutions for the biomass industry; the addition of selective catalytic reduction technology; electrostatic precipitators, baghouses, and cyclones; and scrubbers. The District found that Rule 4352 currently has in place the most stringent measures feasible to implement in the Valley.²⁷ The District re-evaluated the aforementioned options and has determined that no additional feasible opportunities have been developed in the last 12 months since the adoption of the *2015 PM_{2.5} Plan*. Therefore, there are no additional emission reduction opportunities at this time.

C.11.7 Evaluation Findings

Rule 4352 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

²⁷ SJVUAPCD. 2015 Plan for the 1997 PM_{2.5} Standard. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

C.12 RULE 4354 GLASS MELTING FURNACES

C.12.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	6.04	4.08	4.31	4.54	4.69	4.69	4.69	4.69	4.69
VOC	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

The emissions in this emission inventory table represent the emissions from both this rule and from Rule 4610 (Glass Coating Operations).

C.12.2 District Rule 4354 Description

The provisions of Rule 4354 are applicable to glass melting furnaces in the Valley. The purpose of this rule is to limit NOx, SOx, volatile organic compounds (VOC), carbon monoxide (CO), and PM emissions from glass melting furnaces.

Rule 4354 was adopted on September 14, 1994 and has been subsequently amended six times. Rule 4354 was amended September 16, 2010 to strengthen the NOx emission limits in the rule; EPA finalized approval for these amendments on August 29, 2011. Rule 4354 was subsequently amended again in May 19, 2011 to implement updated start-up requirements; EPA finalized approval of the 2011 amendments to Rule 4354 on January 31, 2013 and deemed this rule as being as stringent as, if not more stringent than, established RACT requirements. As a result of this stringent prohibitory rule and continuing efforts on behalf of this industry to reduce emissions, the Valley is home to glass-making facilities with glass melting furnaces that utilize the most advanced low-NOx firing technology.

Industrial glass making is a continuous process with raw materials supplied to the furnace at the front end, and product taken off the line at the back end of the process. The raw materials for making glass are silica sand and soda ash. Melting these basic materials and forming them into the desired product geometry creates the final glass product. The different end products vary widely in raw material additives, processing equipment and conditions, and product quality requirements. The emission limits of Rule 4354 depend on the type of glass produced, furnace firing technology and the emission-averaging period.

Rule 4354 is among the most stringent rules in the nation for glass melting furnaces. The NOx emission limits contained within Rule 4354 require the installation of the best available NOx technology (i.e. oxy-fuel firing or SCR systems).

C.12.3 How does District Rule 4354 compare with federal rules and regulations?

C.12.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.12.3.2 EPA – Alternative Control Technology (ACT)

C.12.3.2.1 ACT - EPA-435/R-94-037 (Alternative Control Techniques Document—NO_x Emissions from Glass Manufacturing)

This ACT document outlines the available control techniques for three types of glass melting furnaces – container glass, flat glass and pressed-and-blown glass. The document lists no specific NO_x emission limit, although it does suggest estimated percent NO_x reduction from uncontrolled levels. In not having a specific NO_x limit for any of the subject furnaces, the document does not define RACT for the three types of glass. As such, the requirements of Rule 4354 are as stringent as or more stringent than the requirements in the ACT.

C.12.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.12.3.3.1 NSPS - 40 CFR 60 Subpart CC (Standards of Performance for Glass Manufacturing Plants)

This NSPS targets the control of particulate matter from the specified glass manufacturing processes. As such, it defines applicable RACT for these sources. The requirements of Rule 4354 are as stringent as or more stringent than the requirements in the NSPS.

C.12.3.3.2 NSPS - 40 CFR 60 Subpart PPP (Standards of Performance for Wool Fiberglass Insulation Manufacturing Plants)

This NSPS targets the control of particulate matter from the specified glass manufacturing processes. As such, it does not regulate NO_x or VOC for this source category; therefore this NSPS does not define applicable RACT for this source category.

C.12.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.12.3.4.1 NESHAP/ MACT - 40 CFR 61 Subpart N (National Emission Standard for Inorganic Arsenic Emissions from Glass Manufacturing Plants)

40 CFR 61 Subpart N was last amended February 27, 2014; however, this NESHAP only regulates inorganic arsenic emissions and therefore does not apply to this control measure source category evaluation.

C.12.3.4.2 NESHAP/MACT - 40 CFR 63 Subpart NNN (National Emission Standards for Hazardous Air Pollutants for Wool Fiberglass Manufacturing Plants)

The portion of this MACT that applies to glass melting furnaces is specific to particulate matter emission limits and subsequent recordkeeping. As such, it does not regulate

NOx or VOC for this source category; therefore this MACT standard does not define applicable RACT for this source category.

C.12.3.4.3 NESHAP/MACT - 40 CFR 63 Subpart SSSSSS (National Emission Standards for Hazardous Air Pollutants for Glass Manufacturing Area Sources)

The portion of this MACT that applies to glass melting furnaces is specific to particulate matter emission limits and subsequent recordkeeping. As such, it does not regulate NOx or VOC for this source category; therefore this MACT standard does not define applicable RACT for this source category.

C.12.4 How does District Rule 4354 compare with California State regulations?

There are no state regulations specific to glass melting furnaces.

C.12.5 How does District Rule 4354 compare to regulations from other air districts?

C.12.5.1 Bay Area AQMD

C.12.5.1.1 Regulation 9 Rule 12 (Nitrogen Oxide Emissions from Glass Melting Furnaces)

Regulation 9-12 was adopted on January 19, 1994, and never amended, regulates the NOx emissions from glass melting furnaces with the exception of furnaces in which all the heat required for melting is provided by electric current and furnaces with a production capacity of 5 short tons of glass per day or less. The rule has a single NOx emission limit of 5.5 pounds of NOx per ton of glass pulled; however, there are no flat glass melting furnaces within the Bay Area AQMD, meaning the emission limit has not been achieved in practice in the Bay Area AQMD. The requirements in Rule 4354 are as stringent as or more stringent than those in Rule 9-12. EPA approved the District's 2009 RACT SIP on January 10, 2012 and deemed this rule as being at least as stringent as established RACT requirements. EPA reconfirmed this RACT determination when approving the District's 2011 amendments to the rule on January 31, 2013.

C.12.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.12.5.3 South Coast AQMD

C.12.5.3.1 Rule 1117 (Emissions of Oxides of Nitrogen from Glass Melting Furnaces)

Adopted in 1982 and subsequently amended in 1984, South Coast AQMD Rule 1117 has a single NO_x limit of 4.0 pounds per ton glass pulled, however the limit does not apply to tableware glass, flat glass, or fiberglass furnaces – these are specifically exempt under Rule 1117. Meaning Rule 1117 applies only to container glass furnaces. Alternative emission control plans are allowed which let emissions to be averaged over more than one furnace as long as the total emissions are no greater than if each furnace was individually meeting the emission limit. Rule 4354 has lower NO_x limits for container glass than South Coast Rule 1117. The District rule also goes beyond the South Coast AQMD rule to limit NO_x emissions from flat glass and fiberglass furnaces. Additionally, the alternative emission control plan in District Rule 4354 requires a 10% reduction in total emissions for the averaged group of furnaces over controlling the furnaces individually.

District Rule 4354 is far more stringent than SCAQMD Rule 1117. District Rule 4354 requires a NO_x limit of 1.5 lbs per ton of glass produced for container glass plants, while SCAQMD Rule 1117 requires a NO_x limit of 4.0 lbs per ton of glass produced. Even though the District limit is at 1.5 lbs per ton of glass produced, the majority of glass plants in the Valley produce emissions much lower than the Rule limit.

It's important to note that the achievable NO_x emissions level for glass furnaces is affected by factors other than the emission control device used. These other factors include the stability of the glass pull rate over an extended period of time, and the condition and age of the refractories and furnace insulation. When the operator adjusts the pull rate of the furnace in response to the market need, additional NO_x emissions may occur during the transition time while the low-NO_x oxy-fuel burners adjust to accommodate the new pull rate. To maintain high temperature levels, glass furnaces require high levels of heat input which is independent from the level of glass pulled each day but is specific to each glass furnace. In addition to this "baseline" heat input, additional energy is necessary to melt glass. This variable heat input required to melt glass fluctuates according to the quantity of glass pulled and is added to the "baseline" heat input. As a result, the total heat input necessary to melt a ton of glass varies according to the overall quantity of glass melted in conjunction with the intersect characteristics of the glass furnace. Consequently, the lb-NO_x/ton varies in similar ways and is impacted by the glass pull rate.

The container glass furnaces in operation in the Valley manufacture a large variety of sizes and shapes of still and sparkling wine glass bottles, requiring the operators to utilize their furnaces in a fashion that results in a less stable pull rate in far varying conditions than facilities located in the South Coast which are mainly producing beer bottles. Due to the less stable pull rate, additional NO_x emissions are expected during the change in the fire rate of the burners as explained above. Additionally, in response to business demands on the wine industry, Valley facilities must operate furnaces with a

high degree of flexibility and variable operational conditions causing constant changes in the furnace pull rate and variations in NO_x emissions.

Finally, as furnaces age, the refractory is not as effective at retaining heat in the furnace. Therefore, under such conditions, the burner fire rate must be increased over time to maintain the same overall furnace and glass temperature and NO_x on a lb/ton basis is expected to increase accordingly. The combination of these factors results in a situation where the NO_x emission rate varies significantly over production conditions, campaign, and furnace life. Therefore, a simple comparison cannot be made between glass plants and their associated emissions limits and a thorough evaluation assessing all the multiple factors must be taken into consideration.

C.12.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.12.6 Potential Emission Reduction Opportunities

In its *2015 Plan for the 1997 PM_{2.5} Standard (2015 PM_{2.5} Plan)* the District evaluated this source category to determine if there are any feasible emission reduction opportunities. This extensive effort included the evaluation of SO_x limits for container glass plants. The District found that Rule 4354 currently has in place the most stringent measures feasible to implement in the Valley.²⁸ The District re-evaluated the aforementioned options and has determined that no additional feasible opportunities have been developed in the last 12 months since the adoption of the *2015 PM_{2.5} Plan*. Therefore, there are no additional emission reduction opportunities at this time.

C.12.7 Evaluation Findings

Rule 4354 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

²⁸ SJVUAPCD. 2015 Plan for the 1997 PM_{2.5} Standard. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

C.13 RULE 4401 STEAM-ENHANCED CRUDE OIL PRODUCTION WELLS

C.13.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
VOC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Emissions from this category are mapped to other emission source categories.

C.13.2 District Rule 4401 Description

This rule applies to all steam-enhanced crude oil production wells and any associated VOC collection and control systems. The purpose of this rule is to limit VOC emissions from these sources. The primary source of VOC emissions from the wells is the casing vent. The emissions from a casing vent are usually controlled through the operation of a VOC collection and control device.

The rule prohibits the operation of a steam-enhanced crude oil production well, except cyclic wells meeting certain requirements, unless the uncontrolled VOC emissions from any well vent are reduced by at least 99 percent by weight, or, if several steam-enhanced crude oil production well vents are connected to a vapor collection and control system, this rule requires that total uncontrolled VOC emissions be reduced by at least 99 percent.

Fugitive VOC emissions can also occur from oil and gas flowing through the various components (such as valves and flanges) that are part of the piping from the wells to the emission control system. Rule 4401 contains a schedule that specifies the number of allowable component leaks based on the number of wells connected to a vapor collection and control system. Rule 4401 requires an operator, upon detection of a leak, to affix a readily visible tag bearing the date on which the leak is detected. Rule 4401 further requires an operator to repair a leak within fifteen calendar days; failure to repair the leak would constitute a violation of the rule.

EPA finalized approval of the 2011 amendments to Rule 4401 on November 16, 2011 and deemed this rule as being at least as stringent as established RACT requirements.²⁹ EPA further confirmed this RACT determination when they finalized a partial approval/partial disapproval of the 2009 RACT SIP on January 10, 2012 and again deemed this rule as being at least as stringent as established RACT requirements.³⁰

²⁹ EPA. Revisions to the California State Implementation Plan, San Joaquin Valley Unified Air Pollution Control District; Final Rule. 76 Fed. Reg. 221, pp. 70886 – 70887. (2011, November 16). (to be codified at 40 CFR Part 52). Retrieved from <http://www.gpo.gov/fdsys/pkg/FR-2011-11-16/pdf/2011-29466.pdf>

³⁰ EPA. Partial Approval and Partial Disapproval of Air Quality Implementation Plans; California; San Joaquin Valley; Reasonably Available Control Technology for Ozone; Final Rule. 77 Fed. Reg. 6, pp 1417 – 1427. (2012, January

C.13.3 How does District Rule 4401 compare with federal rules and regulations?

C.13.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.13.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.13.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.13.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.13.4 How does District Rule 4401 compare with California State regulations?

There are no state regulations applicable to this source category.

C.13.5 How does District Rule 4401 compare to regulations from other air districts?

C.13.5.1 Bay Area AQMD

There are no analogous rules for this source category.

C.13.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.13.5.3 South Coast AQMD

C.13.5.3.1 Rule 1148 (Thermally Enhanced Oil Recovery Wells)

South Coast AQMD Rule 1148 (Thermally Enhanced Oil Recovery Wells) was adopted on November 5, 1982 and has not been amended. Rule 1148 requires that ROG emissions from a steam drive well not to exceed 4.5 lb/day or if steamed drive wells are connected to vapor control system ROG emissions from the control system shall average no more than 4.5 lb/day/connected well.

Using CARB emissions factor for uncontrolled steam drive well of 220 lb-VOC/day, Rule

10). (to be codified at 40 CFR Part 52). Retrieved from <http://www.gpo.gov/fdsys/pkg/FR-2012-01-10/pdf/2012-139.pdf>

4401's 99% control requirement equates to 2.2 lb/day/well, which is more stringent than 4.5 lb/day/well (heavy oil production results in no methane or ethane, meaning 100% of ROG's are considered VOCs).

South Coast AQMD Rule 1148 does not specify any fugitive VOC leak detection and repair provisions whereas Rule 4401 specifies the number of allowable component leaks based on the number of wells connected to a vapor collection and control system. Rule 4401 requires an operator, upon detection of a leak, to affix a readily visible tag bearing the date on which the leak is detected. Rule 4401 further requires an operator to repair a leak within fifteen (15) calendar days; failure to repair the leak would constitute a violation of the rule.

South Coast AQMD Rule 1148 contains a six month exemption for steam drive wells if steam is injected more frequently than 45 days and amount of steam injection expressed as water is more than 2,000 barrels. Rule 4401 provides exemptions for up to 40 cyclic wells owned by a company that are undergoing pilot testing and well stimulation. Rule 4401 also exempts for up to 5 cyclic wells (20 cyclic wells for small producer) if wells are located more than 1000 feet from an existing well control system operated by the company and operation is under District permit. South Coast AQMD Rule 1148 does not limit number of wells that can be exempt and Rule 4401 does not limit duration of exemption. Therefore exemptions in the both rules cannot be compared directly.

Both South Coast AQMD Rule 1148 and Rule 4401 require annual testing of vapor control systems. However District Rule waives this testing requirement if uncondensed vapors are incinerated in fuel burning equipment, internal combustion engine or in a smokeless flare.

C.13.5.4 The requirements in Rule 4401 are as stringent as or more stringent than those in Rule 1148. Ventura County APCD

There are no analogous rules for this source category.

C.13.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.13.7 Evaluation Findings

Rule 4401 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.14 RULE 4402 CRUDE OIL PRODUCTION SUMPS

C.14.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	2.41	2.25	2.11	1.97	1.85	1.73	1.65	1.62	1.58

C.14.2 District Rule 4402 Description

District Rule 4402 controls VOC emissions from crude oil production sumps located at facilities that produce heavy crude oil. 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.

This rule applies to all first, second, and third stage sumps at facilities producing, gathering, separating, processing, and/or storing crude oil in an oil field. The purpose of this rule is to limit VOC emissions from these sources. EPA finalized a partial approval/partial disapproval of the 2009 RACT SIP on January 10, 2012, but EPA specified that Rule 4402 was one of the few rules not approved as RACT as part of the RACT SIP approval.³¹ EPA finalized approval of the 2011 amendments to Rule 4402 on October 22, 2012 and deemed this rule as being at least as stringent as established RACT requirements.³²

C.14.3 How does District Rule 4402 compare with federal rules and regulations?

C.14.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.14.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.14.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

³¹ 77 FR 1417, <http://www.gpo.gov/fdsys/pkg/FR-2012-01-10/pdf/2012-139.pdf>

³² 77 FR 64427, <http://www.gpo.gov/fdsys/pkg/FR-2012-10-22/pdf/2012-25810.pdf>

C.14.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.14.4 How does District Rule 4402 compare with California State regulations?

There are no state regulations applicable to this source category.

C.14.5 How does District Rule 4402 compare to regulations from other air districts?

C.14.5.1 Bay Area AQMD

There are no analogous rules for this source category.

C.14.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.14.5.3 South Coast AQMD

There are no analogous rules for this source category.

C.14.5.4 Ventura County APCD

C.14.5.4.1 Rule 71.4 (Petroleum Sumps, Pits, Ponds and Well Cellars)

The control requirements of Rule 4402 are essentially the same as Rule 71.4. Although VCAPCD Rule 71.4 prohibits the use of first stage sumps, the District believes that other VCAPCD either do not have first stage sumps or such sumps have been replaced with tanks. Although use of first stage sumps is allowed by District Rule 4402, it does not necessarily mean that the rule is less stringent than other air districts' rules, for the following reason. If first stage sumps are replaced with tanks, the tanks would be subject to another rule that control emissions from the storage of organic liquids. District Rule 4623 (Storage of Organic Liquids) applies to tanks that have a capacity of at least 1,100 gallons that store organic liquids with a true vapor pressure (TVP) of 0.5 psia or greater. The tank VOC control requirements are based on the tank size and true vapor pressure (TVP) of the stored organic liquid. Organic liquids with a TVP less than 0.5 psia would not be subject to the VOC control requirements of Rule 4623. Replacing first stage sump with a tank could result in an unintended consequence that the tank would either be totally uncontrolled or less effectively controlled compared to Rule 4402 because the TVP might be lower than the control trigger level specified in Rule 4623.

Based on the District's Permit database, staff has determined that there are only very few permitted small-size first-stage sumps for processing heavy crude oil that were issued to very small producers (less than 150 barrels of oil/day production) and they are not major sources (less than 10 tons per year of VOC or NOx). The source testing

required by Rule 4623, shows the TVP of the heavy crude oil is less than 0.5 psia. As discussed above, prohibiting the use of first stage sumps would essentially force operators to replace the sumps with tanks, which could result in the tanks being exempt from Rule 4623 because the TVP is less than 0.5 psia. Although Rule 4402 allows the use of first stage sumps, the controls are equal to or better than that which would be required for such materials stored in tanks. Furthermore, it is important to mention that the District's 2007 survey of crude oil sumps⁴ revealed that there are no active first stage sumps operating in the San Joaquin Valley.

Therefore, the requirements in Rule 4402 are as stringent as or more stringent than those in Rule 71.4.

C.14.5.5 Other Air Quality Control Agencies

Santa Barbara APCD - Rule 344 (Petroleum Sumps, Pits and Well Cellars)

Rule 4402 exempts small producers' second and third stage sumps less than 1,000 square feet surface area used exclusively for heavy crude oil. Another exemption is provided for very small producer second and third stage sumps less than 5,000 square feet used exclusively for heavy crude oil. Small producer is defined in the rule as a producer whose oil production does not exceed 6,000 barrels/day. Very small oil producer is defined in Rule 4402 as a producer whose oil production does not exceed 150 barrels/day, similar to SBCAPCD Rule 344. The requirements in Rule 4402 are as stringent as or more stringent than those in Rule 344.

C.14.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.14.7 Evaluation Findings

Rule 4402 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.15 RULE 4404 HEAVY OIL TEST STATION —KERN COUNTY

C.15.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	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	0.00

The inventory for this source category is 0.00 tpd because there are no Heavy Oil Test Stations (HOTS) in operation in the Valley.

C.15.2 District Rule 4404 Description

This rule applies to the operation of heavy oil test stations with tanks that vent directly to the atmosphere. The purpose of this rule is to limit VOC emissions from the operation of heavy oil test stations. A HOTS is a tank setting comprised of both a family tank and one or more test tanks. A family tank directly receives crude oil production from more than one steam drive well through individual production lines with discharge into the tank. A test tank tests the production rate from a single steam drive well.

Rule 4404 prohibits operation of HOTS unless the VOC emissions are reduced by at least 99%. Except during sampling, gauging, and PV valve vent, any tank roof opening must be equipped with a cover, seal, or lid with no visible gap and maintained in a gas-tight condition.

Requirements of this rule are applicable to HOTS that are atmospheric tanks. A review of the District's permit database and observations of Compliance Division indicate that there are no atmospheric HOTS operating in the Valley. All previous HOTS operations are now employing pressure vessels which do not vent to the atmosphere. These unvented pressure vessels are exempt from District permitting per section 6.13 of District Rule 2020. Therefore, the VOC emissions from this source category are zero.

C.15.3 How does District Rule 4404 compare with federal rules and regulations?

C.15.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.15.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.15.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.15.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.15.4 How does District Rule 4404 compare with California State regulations?

There are no state regulations applicable to this source category.

C.15.5 How does District Rule 4404 compare to regulations from other air districts?**C.15.5.1 Bay Area AQMD**

Bay Area AQMD has no analogous rules for this source category.

C.15.5.2 Sacramento Metro AQMD

Sacramento Metro AQMD has no analogous rules for this source category.

C.15.5.3 South Coast AQMD

South Coast AQMD has no analogous rules for this source category.

C.15.5.4 Ventura County APCD

Ventura County has no analogous rules for this source category.

C.15.6 Potential Emission Reduction Opportunities

There are no atmospheric HOTS in operation in the Valley. All HOTS operations now employ pressure vessels that do not vent to the atmosphere, and such vessels are exempt from District permitting per section 6.13 of District Rule 2020.

C.15.7 Evaluation Findings

Rule 4404 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category.

C.16 RULE 4407 IN-SITU COMBUSTION WELL VENTS

C.16.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	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	0.00

The emission inventory for this source category is 0.00 tpd because there are no in-situ combustion well vents operating in the Valley.

C.16.2 District Rule 4407 Description

District Rule 4407 controls VOC emissions from in-situ combustion well vents. The rule applies to all crude oil production wells where production has been enhanced by in-situ combustion. In situ-combustion is defined in the rule as a thermal crude oil recovery process in which air is injected into an oil reservoir and in-place petroleum oxidizes at an accelerated rate. The heat of combustion and combustion products enhance oil production by decreasing oil viscosity and pressurizing the reservoir. In-situ combustion well is any crude oil production well which produces from the same zone in which an air injection well is completed and lies within 1,000 feet from an injection well.

District Rule 4407 prohibits operation of any in-situ combustion well unless the well vent is connected to an emission control device which abates 85% by weight of entering VOC gases or is connected to a fuel burning equipment (furnace, boiler, etc) or a smokeless flare. All components (piping, valves, fittings, pumps, compressors, etc.) should be maintained in good repair and must be inspected for leaks on a quarterly basis. If no more than 2% of all components of the collection system are found to be leaking during each three consecutive quarterly inspections, the inspection frequency may be changed from quarterly to annual. The total number of leaks in a collection system should not exceed 2% of all the components in the collection system. Upon detection of a leak, the operator should affix a visible tag indicating the date of detection of the leak and the tag must remain in place until the leak is repaired. A leaking component must be repaired within 15 days of leak detection, but a ten day extension to repair a leak may be granted provided the operator demonstrates that necessary and sufficient actions have been taken to correct the leak. Failure to repair a leak after the ten day extension constitutes a violation of the rule.

District Rule 4407 requires annual testing of the VOC control efficiency of the control and collection system (testing should be conducted during June, July, August, or September of each year if the system's control efficiency is dependent upon ambient temperature). The APCO may waive the test requirement if all uncondensed VOC emissions are collected by a collection and control system are burned in fuel burning equipment or a smokeless flare.

Currently there are no in-situ combustion crude oil wells operating in the Valley.

C.16.3 How does District Rule 4407 compare with federal rules and regulations?

C.16.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.16.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.16.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.16.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.16.4 How does District Rule 4407 compare with California State regulations?

There are no state regulations applicable to this source category.

C.16.5 How does District Rule 4407 compare to regulations from other air districts?

C.16.5.1 Bay Area AQMD

Bay Area AQMD has no analogous rules for this source category.

C.16.5.2 Sacramento Metro AQMD

Sacramento Metro AQMD has no analogous rules for this source category.

C.16.5.3 South Coast AQMD

South Coast AQMD has no analogous rules for this source category.

C.16.5.4 Ventura County APCD

Ventura County APCD has no analogous rules for this source category.

C.16.6 Potential Emission Reduction Opportunities

There are no in-situ combustion well vents operating in the Valley and thus no emission reduction opportunities for this category exist.

C.16.7 Evaluation Findings

There are no in-situ combustion well vents operating in the Valley and thus no emission reduction opportunities for this category exist. Any facility beginning use of such activity would be required to meet District BACT requirements, per District Rules 2201 (New and Modified Stationary Source Review Rule).

Rule 4407 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.17 RULE 4408 GLYCOL DEHYDRATION SYSTEMS

C.17.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
VOC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

The emissions from this rule are accounted for in the discussion for Rule 4409 (Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities).

C.17.2 District Rule 4408 Description

This rule applies to any glycol dehydration system with a glycol dehydration vent that is subject to permitting requirements pursuant to Regulation II (Permits). The purpose of this rule is to limit VOC emissions from these sources.

C.17.3 How does District Rule 4408 compare with federal rules and regulations?

C.17.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.17.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.17.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.17.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.17.3.4.1 NESHAP/MACT - 40 CFR 63 Subpart HH (National Emission Standards for Hazardous Air Pollutants for Oil and Natural Gas Production)

The requirements of Rule 4408 are as stringent as or more stringent than the requirements in the NESHAP, since Rule 4408 requires controls on systems producing much smaller flow rates than the NESHAP threshold.

C.17.4 How does District Rule 4408 compare with California State regulations?

There are no state regulations applicable to this source category.

C.17.5 How does District Rule 4408 compare to regulations from other air districts?**C.17.5.1 Bay Area AQMD**

There are no analogous rules for this source category.

C.17.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.17.5.3 South Coast AQMD

There are no analogous rules for this source category.

C.17.5.4 Ventura County APCD**C.17.5.4.1 Rule 71.5 (Glycol Dehydrators)**

The requirements in Rule 4408 are as stringent as or more stringent than those in Rule 71.5.

C.17.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.17.7 Evaluation Findings

Rule 4408 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.18 RULE 4409 COMPONENTS AT LIGHT CRUDE OIL PRODUCTION FACILITIES, NATURAL GAS PRODUCTION FACILITIES, AND NATURAL GAS PROCESSING FACILITIES

C.18.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	1.21	1.13	1.06	0.99	0.93	0.87	0.83	0.81	0.79

This emission inventory table is comprised of the emission inventory of sources subject to Rules 4408 (Glycol Dehydration Systems), Rule 4409 (Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities), Rule 4453 (Refinery Vacuum Producing Devices or Systems), and Rule 4454 (Refinery Process Unit Turnaround).

C.18.2 District Rule 4409 Description

This rule applies to components containing or contacting VOC streams at light crude oil production facilities, natural gas production facilities, and natural gas processing facilities. The purpose of this rule is to limit VOC emissions from leaking components at these facilities.

C.18.3 How does District Rule 4409 compare with federal rules and regulations?

C.18.3.1 EPA – Control Technique Guidelines (CTG)

C.18.3.1.1 CTG - EPA-450/3-83-007 (Control of Volatile Organic Compound Equipment Leaks from Natural Gas/Gasoline Processing Plants)

The requirements of Rule 4409 are as stringent as or more stringent than the requirements in the CTG.

C.18.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.18.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.18.3.3.1 NSPS - 40 CFR 60 Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution)

The requirements of Rule 4409 are as stringent as or more stringent than the requirements in the NSPS.

C.18.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)**C.18.3.4.1 NESHAP/MACT - 40 CFR 63 Subpart HH (National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities)**

The requirements of Rule 4409 are as stringent as or more stringent than the requirements in the NESHAP.

C.18.4 How does District Rule 4409 compare with California State regulations?

There are no state regulations applicable to this source category.

C.18.5 How does District Rule 4409 compare to regulations from other air districts?**C.18.5.1 Bay Area AQMD****C.18.5.1.1 Regulation 8 Rule 18 (Equipment Leaks),**

The requirements in Rule 4409 are as stringent as or more stringent than those in Rule 8-18.

C.18.5.1.2 Regulation 8 Rule 22 (Valves and Flanges at Chemical Plants)

The requirements in Rule 4409 are as stringent as or more stringent than those in Rule 8-22.

C.18.5.1.3 Regulation 8 Rule 28 (Episodic Releases From Pressure Relief Devices at Petroleum Refineries and Chemical Plants)

The requirements in Rule 4409 are as stringent as or more stringent than those in Rule 8-28.

C.18.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.18.5.3 South Coast AQMD**C.18.5.3.1 Rule 1173 (Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants)**

The requirements in Rule 4409 are as stringent as or more stringent than those in Rule 1173.

C.18.5.4 Ventura County APCD

C.18.5.4.1 74.7 (Fugitive Emissions of Reactive Organic Compounds at Petroleum Refineries and Chemical Plants), and

The requirements in Rule 4409 are as stringent as or more stringent than those in Rule 74.7.

C.18.5.4.2 Rule 74.10 (Components at Crude Oil and Natural Gas Production and Processing Facilities)

The requirements in Rule 4409 are as stringent as or more stringent than those in Rule 74.10.

C.18.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.18.7 Evaluation Findings

Rule 4409 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.19 RULE 4453 REFINERY VACUUM PRODUCING DEVICES OR SYSTEMS

C.19.1.1.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
VOC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

The emissions from this rule are accounted for in the discussion for Rule 4409 (Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities).

C.19.2 District Rule 4453 Description

This rule applies to any vacuum producing device or system, including hot wells and accumulators installed in a refinery operation. The purpose of this rule is to limit VOC emissions from refinery vacuum producing devices or systems.

C.19.3 How does District Rule 4453 compare with federal rules and regulations?

C.19.3.1 EPA – Control Technique Guidelines (CTG)

C.19.3.1.1 CTG – EPA-450/2-77-025 (Control of Refinery Vacuum Producing Systems, Wastewater Separators, and Process Unit Turnarounds)

The requirements of Rule 4453 are as stringent as or more stringent than the requirements in the CTG.

C.19.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.19.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.19.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.19.4 How does District Rule 4453 compare with California State regulations?

There are no state regulations applicable to this source category.

C.19.5 How does District Rule 4453 compare to regulations from other air districts?

C.19.5.1 Bay Area AQMD**C.19.5.1.1 Regulation 8 Rule 9 (Vacuum Producing Systems)**

The requirements in Rule 4453 are as stringent as or more stringent than those in Rule 8-9.

C.19.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.19.5.3 South Coast AQMD**C.19.5.3.1 Rule 465 (Refinery Vacuum-Producing Devices or Systems)**

The requirements in Rule 4453 are as stringent as or more stringent than those in Rule 465.

C.19.5.4 Ventura County APCD**C.19.5.4.1 Rule 74.8 (Refinery Vacuum Producing Systems, Wastewater Separators and Process Turnarounds)**

The requirements in Rule 4453 are as stringent as or more stringent than those in Rule 74.8.

C.19.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.19.7 Evaluation Findings

Rule 4453 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.20 RULE 4454 REFINERY PROCESS UNIT TURNAROUND

C.20.1.1.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
VOC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

The emissions from this rule are accounted for in the discussion for Rule 4409 (Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities).

C.20.2 District Rule 4454 Description

This rule applies to any refinery vessel containing VOCs, unless exempted. The purpose of this rule is to limit VOC emissions resulting from the purging, repair, cleaning, or otherwise opening or releasing pressure from a refinery vessel during a process unit turnaround.

C.20.3 How does District Rule 4454 compare with federal rules and regulations?

C.20.3.1 EPA – Control Technique Guidelines (CTG)

C.20.3.1.1 CTG – EPA-450/2-77-025 (Control of Refinery Vacuum Producing Systems, Water Separators and Process Unit Turnarounds)

The requirements of Rule 4454 are as stringent as or more stringent than the requirements in the CTG.

C.20.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.20.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.20.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.20.3.4.1 40 CFR 63 Subpart CC (National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries)

The applicable MACT guideline was amended in 2010; however, the amendments did not implement any requirements more stringent than what is required in Rule 4454. The requirements of Rule 4454 are as stringent as or more stringent than the requirements in the MACT.

C.20.4 How does District Rule 4454 compare with California State regulations?

There are no state regulations applicable to this source category.

C.20.5 How does District Rule 4454 compare to regulations from other air districts?**C.20.5.1 Bay Area AQMD****C.20.5.1.1 Regulation 8 Rule 10 (Process Vessel Depressurization)**

The requirements in Rule 4454 are as stringent as or more stringent than those in Rule 8-10.

C.20.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.20.5.3 South Coast AQMD**C.20.5.3.1 SCAQMD Rule 1123 (Refinery Process Turnarounds)**

The requirements in Rule 4454 are as stringent as or more stringent than those in Rule 1123.

C.20.5.4 Ventura County APCD**C.20.5.4.1 Rule 74.8 (Refinery Vacuum Producing Systems, Wastewater Separators and Process Turnarounds)**

The requirements in Rule 4454 are as stringent as or more stringent than those in Rule 74.8.

C.20.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.20.7 Evaluation Findings

Rule 4454 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.21 RULE 4455 COMPONENTS AT PETROLEUM REFINERIES, GAS LIQUIDS PROCESSING FACILITIES, AND CHEMICAL PLANTS

C.21.1.1.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40

C.21.2 District Rule 4455 Description

This rule applies to components containing or contacting VOC at petroleum refineries, gas liquid processing facilities, and chemical plants. The purpose of this rule is to limit VOC emissions from leaking components at these facilities.

C.21.3 How does District Rule 4455 compare with federal rules and regulations?

C.21.3.1 EPA – Control Technique Guidelines (CTG)

C.21.3.1.1 CTG - EPA-450/3-83-007 (Control of Volatile Organic Compound Equipment Leaks from Natural Gas/Gasoline Processing Plants)

The requirements of Rule 4455 are as stringent as or more stringent than the requirements in the CTG.

C.21.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.21.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.21.3.3.1 NSPS (40 CFR 60 Subpart OOOO—Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution)

The requirements of Rule 4455 are as stringent as or more stringent than the requirements in the NSPS.

C.21.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)**C.21.3.4.1 NESHAP/MACT – 40 CFR 63 Subpart HH (National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities)**

The requirements of Rule 4455 are as stringent as or more stringent than the requirements in the NESHAP/MACT.

C.21.4 How does District Rule 4455 compare with California State regulations?

There are no state regulations applicable to this source category

C.21.5 How does District Rule 4455 compare to regulations from other air districts?**C.21.5.1 Bay Area AQMD****C.21.5.1.1 Regulation 8 Rule 18 (Equipment Leaks)**

The requirements in Rule 4455 are as stringent as or more stringent than those in Rule 8-18.

C.21.5.1.2 Regulation 8 Rule 22 (Valves and Flanges at Chemical Plants)

The requirements in Rule 4455 are as stringent as or more stringent than those in Rule 8-22.

C.21.5.1.3 Regulation 8 Rule 28 (Episodic Releases From Pressure Relief Devices at Petroleum Refineries and Chemical Plants)

The requirements in Rule 4455 are as stringent as or more stringent than those in Rule 8-28.

C.21.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.21.5.3 South Coast AQMD**C.21.5.3.1 Rule 1173 (Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants)**

The requirements in Rule 4455 are as stringent as or more stringent than those in Rule 1173.

C.21.5.4 Ventura County APCD

C.21.5.4.1 Rule 74.7 (Fugitive Emissions of Reactive Organic Compounds at Petroleum Refineries and Chemical Plants)

The requirements in Rule 4455 are as stringent as or more stringent than those in Rule 74.7.

C.21.5.4.2 Rule 74.10 (Components at Crude Oil and Natural Gas Production and Processing Facilities)

The requirements in Rule 4455 are as stringent as or more stringent than those in Rule 74.10.

C.21.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.21.7 Evaluation Findings

Rule 4455 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.22 RULE 4565 BIOSOLIDS, ANIMAL MANURE, AND POULTRY LITTER OPERATIONS

C.22.1.1.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	21.35	22.11	22.68	23.71	25.18	26.22	27.39	27.73	28.02

This emission inventory table includes emissions for sources subject to this rule and Rule 4566 (Organic Material Composting Operations).

C.22.2 District Rule 4565 Description

Rule 4565 was adopted on March 15, 2007. The provisions of this rule limit VOC emissions from facilities whose throughput consists entirely or in part of Biosolids, animal manure, or poultry litter. Rule 4565 is applicable to operations that landfill, land apply, compost, or co-compost these materials.

C.22.3 How does District Rule 4565 compare with federal rules and regulations?

C.22.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.22.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.22.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.22.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.22.4 How does District Rule 4565 compare with California State regulations?

There are no state regulations applicable to this source category.

C.22.5 How does District Rule 4565 compare to regulations from other air districts?

C.22.5.1 Bay Area AQMD

There are no analogous rules for this source category.

C.22.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.22.5.3 South Coast AQMD

C.22.5.3.1 Rule 1133.2 (Emission Reductions from Co-Composting Operations)

Rule 1133.2 was adopted on January 10, 2003, and has not been amended. This rule is applicable to new and existing co-composting operations operating within the jurisdictional boundaries of the South Coast AQMD. Rule 1133.2 requires operators of new operations to conduct all active co-composting within the confines of an enclosure that meets specific requirements. In lieu of compliance with rule requirements, these operations have the option to submit a compliance plan. During the development of the District's 2015 PM_{2.5} Plan³³ the District conducted an extensive analysis comparing the requirements of Rule 4565 to Rule 1133.2. The District determined that overall Rule 4565 is more stringent than Rule 1133.2. This determination is further supported by the District's 2009 RACT SIP demonstration report³⁴ and the District's 2013 Plan for the Revoked 1-hour Ozone Standard,³⁵ as approved by EPA.³⁶

C.22.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.22.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.22.7 Evaluation Findings

Rule 4565 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

³³ SJVAPCD. 2015 Plan for the 1997 PM_{2.5} Standard. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

³⁴ SJVAPCD. Reasonably Available Control Technology Demonstration for Ozone State Implementation Plans. (2009, April 16). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/docs/RACTSIP-2009.pdf

³⁵ SJVAPCD. 2013 Plan for the Revoked 1-Hour Ozone Standard. (2013, September 19). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

³⁶ EPA. Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

C.23 RULE 4566 ORGANIC MATERIAL COMPOSTING OPERATIONS

C.23.1.1.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
VOC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

The emissions from this source category are included in the emission inventory table for Rule 4565 (Biosolids, Animal Manure, and Poultry Litter Operations).

C.23.2 District Rule 4566 Description

District Rule 4566, was adopted on August 18, 2011, to limit VOC emissions from composting facilities whose feedstock consists of greenwaste and/or foodwaste. District Rule 4566 applies to operations that stockpile and compost greenwaste and foodwaste.

C.23.3 How does District Rule 4566 compare with federal rules and regulations?

C.23.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.23.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.23.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.23.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.23.4 How does District Rule 4566 compare with California State regulations?

There are no state regulations applicable to this source category.

C.23.5 How does District Rule 4566 compare to regulations from other air districts?

C.23.5.1 Bay Area AQMD

There are no analogous rules for this source category.

C.23.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.23.5.3 South Coast AQMD

C.23.5.3.1 Rule 1133.3 (Greenwaste Composting)

Rule 1133.3 was adopted on July 8, 2011, and has not been amended. The purpose of this rule is to reduce fugitive emissions of VOC and ammonia from greenwaste and foodwaste composting operations. During the development of the District's 2015 PM_{2.5} Plan³⁷ the District conducted an extensive analysis comparing the requirements of Rule 4566 to Rule 1133.3. The District determined that overall; Rule 4566 is more stringent than Rule 1133.3. This determination is further supported by the District's 2009 RACT SIP demonstration report³⁸ and the District's 2013 Plan for the Revoked 1-hour Ozone Standard,³⁹ as approved by EPA.⁴⁰

C.23.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.23.6 Potential Emission Reduction Opportunities

In its 2015 PM_{2.5} Plan the District evaluated this source category to determine if there are any feasible emission reduction opportunities. Through this extensive effort the District found that Rule 4566 currently has in place the most stringent measures feasible to implement in the Valley.⁴¹ The District re-evaluated the aforementioned options and has determined that no additional feasible opportunities have been developed in the last 12 months since the adoption of the 2015 PM_{2.5} Plan. Therefore, there are no additional emission reduction opportunities at this time.

C.23.7 Evaluation Findings

Rule 4566 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

³⁷ SJVUAPCD. 2015 Plan for the 1997 PM_{2.5} Standard. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

³⁸ SJVAPCD. Reasonably Available Control Technology Demonstration for Ozone State Implementation Plans. (2009, April 16). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/docs/RACISIP-2009.pdf

³⁹ SJVAPCD. 2013 Plan for the Revoked 1-Hour Ozone Standard. (2013, September 19). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁴⁰ EPA. Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

⁴¹ SJVUAPCD. 2015 Plan for the 1997 PM_{2.5} Standard. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

C.24 RULE 4570 CONFINED ANIMAL FACILITIES

C.24.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	95.90	95.90	95.90	95.90	95.90	95.90	95.90	95.90	95.90

C.24.2 District Rule 4570 Description

District Rule 4570, was originally adopted on June 15, 2006 and was most recently amended on October 21, 2010. The purpose of this rule is to limit emissions of VOCs from Confined Animal Facilities (CAFs). District Rule 4570 applies to facilities where animals are corralled, penned, or otherwise caused to remain in restricted areas and primarily fed by a means other than grazing for at least 45 days in any twelve-month period. In addition to limiting VOC emissions, District Rule 4570 also includes measures that limit ammonia (NH₃) emissions from these operations; the required measures have reduced ammonia emissions by over 100 tpd⁴² (this reduction is reflected in the emissions inventory data above). The analysis below focuses on how District Rule 4570 limits NH₃ emissions in comparison to other rules and regulations.

A. Types of Confined Animal Facilities

Confined Animal Facilities are used for the raising of animals including, but not limited to, cattle, calves, chickens, ducks, goats, horses, sheep, swine, rabbits, and turkeys, which are corralled, penned, or otherwise caused to remain in restricted areas for commercial agricultural purposes and fed by a means other than grazing. (CH&SC §39011.5 (a)(1)). The major categories of Confined Animal Facilities are listed below.

- Dairy Operations - Dairy operations are those operations producing milk or animals for facilities that produce milk.
- Poultry Operations - Poultry facilities operate either as layer ranches for egg production or as broiler ranches where birds are grown for the fresh meat market.
- Beef Cattle Feeding Operations – Beef cattle facilities are facilities that raise beef cattle (heifers and steers) for their meat.
- Swine Operations – These operations raise pigs for their meat. The production cycle for hogs has three (3) phases: farrowing (giving birth), nursing, and finishing.

⁴² Appendix F of the Staff Report for the June 2009 re-adoption of Rule 4570, starting on the 329th page of the pdf available here

http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2009/June/Agenda%20Item_10_June_18_2009.pdf

B. Rule 4570 Applicability Thresholds

The thresholds for a facility to be classified as a large CAF in the Valley and the thresholds for a facility to be subject to District Rule 4570 are shown in the following table. The large CAF thresholds are based on the definition of a large CAF adopted by ARB as required by California Senate Bill (SB) 700. District Rule 4570 applies to confined animal facilities that have the capacity to house a number of animals equal to or exceeding the Rule 4570 regulatory thresholds, which are lower than the large CAF thresholds for certain facilities.

Table C-4 Rule 4570 Thresholds for Regulation

Livestock Category	SJVAPCD Large CAF Thresholds	Rule 4570 Regulatory Thresholds
Dairy	1,000 milking cows	500 milking cows
Beef Feedlots	3,500 beef cattle	3,500 beef cattle
Other Cattle Facility	7,500 calves, heifers, or other cattle	7,500 calves, heifers, or other cattle
Poultry Facilities		
Chicken	650,000 head	400,000 head
Duck	650,000 head	400,000 head
Turkey	100,000 head	100,000 head
Swine Facility	3,000 head	3,000 head
Horses Facility	3,000 head	3,000 head
Sheep and Goat Facilities	15,000 head of sheep, goats, or any combination of the two	15,000 head of sheep, goats, or any combination of the two
Any livestock facility not listed above	30,000 head	30,000 head

C. Emission Control Requirements of District Rule 4570

District Rule 4570 requires multiple mitigation measures from the following CAF categories: Dairy, Beef Feedlots, Other Cattle Facilities, Swine Facilities, Poultry facilities, and various other smaller operations. Each of these facilities consists of multiple sources of emissions within the facility. Since these facilities generally cover a large area and have different processes, a single mitigation measure or technology is generally not sufficient to control overall emissions from the facility. Mitigation measures required by Rule 4570 have been tailored for each source of emissions, thereby ensuring that the overall emissions from a facility are reduced. The current methodology in Rule 4570 allows for the greatest overall control from the entire facility.

District Rule 4570 recognized the following five emission sources for all of the CAFs: Feed, Housing, Solid Waste, Liquid Waste, and Land Application of Manure. Rule 4570 requires each CAF to implement a certain number of mitigation measures for each of these sources. District Rule 4570 also distinguishes between the different types of housing configurations (freestall vs open corrals) for cattle and, as such, requires specific mitigation measures for each type of housing. By requiring mitigation

measure(s) for each source of emissions at a facility, District Rule 4570 ensures that reductions are achieved throughout the facility.

C.24.3 How does District Rule 4570 compare with federal rules and regulations?

C.24.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.24.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.24.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.24.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.24.4 How does District Rule 4570 compare with California State regulations?

There are no state regulations applicable to this source category.

C.24.5 How does District Rule 4570 compare to regulations from other air districts?

As the largest agricultural area in California, the District took the lead in devising a list of mitigation measures for the various emission sources during the initial development of District Rule 4570. This list of mitigation measures was essentially utilized, almost identically, by all air districts in their rules. However, during the last amendments to District Rule 4570, all of the mitigation measures were reevaluated in light of the latest available science. In comparison to the previous version of the rule, the current rule has lower threshold limits to bring in additional CAFs, requires additional mitigation measures, clarifies previous mitigation measures, and adds additional monitoring, testing, and recordkeeping to improve enforceability.

C.24.5.1 Bay Area AQMD

C.24.5.1.1 Regulation 2 Rule 10 (Large Confined Animal Facilities)

The requirements in Rule 4570 are as stringent as or more stringent than those in Rule 2-10.

C.24.5.2 Sacramento Metro AQMD

C.24.5.2.1 SMAQMD Rule 496 (Large Confined Animal Facilities)

The requirements in Rule 4570 are as stringent as or more stringent than those in Rule 496.

C.24.5.3 South Coast AQMD

C.24.5.3.1 Rule 223 (Emission Reduction Permits for Large Confined Animal Facilities)

The requirements in Rule 4570 are as stringent as or more stringent than those in Rule 223. In fact, the SCAQMD recently identified District Rule 4570 as the most stringent rule for this source category.⁴³

C.24.5.3.2 Rule 1127 (Emission Reductions from Livestock Waste)

The requirements in Rule 4570 are as stringent as or more stringent than those in Rule 1127.

C.24.5.4 Ventura County APCD

VCAPCD Rule 23 (Exemptions from Permit)

The requirements in Rule 4570 are as stringent as or more stringent than those in Rule 23.

C.24.5.5 Other Air Quality Control Agencies

C.24.5.5.1 Imperial County Air Quality Management District (ICAPCD) Rule 217 (Large Confined Animal Facilities Permits Required) and ICAPCD Policy Number 38 (Recommended Mitigation Measures for Large Confined Animal Facilities)

The requirements in Rule 4570 are as stringent as or more stringent than those in Rule 217 and ICAPCD Policy Number 38.

C.24.5.5.2 Butte County Air Pollution Control District (BCAQMD) Rule 450 (Large Confined Animal Facilities)

⁴³ South Coast Air Quality Management District (June 6, 2014). Reasonably Available Control Technology Demonstration. <http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2014/2014-jun6-031.pdf?sfvrsn=2>

The requirements in Rule 4570 are as stringent as or more stringent than those in Rule 450.

C.24.5.5.3 Yakima Regional Clean Air Agency

The Yakima Regional Clean Air Agency adopted recommended practices for dairy operations on March 8, 2012 in their document *Air Quality Management Policy and Best Management Practices for Dairy Operations*. The policy requires preparation of an annual Air Quality Management Plan and implementation of Best Management Practices to reduce emissions from dairy operations; however, the requirements of District Rule 4570 are more stringent and specific.

C.24.6 Potential Emission Reduction Opportunities

In its *2015 PM_{2.5} Plan* the District evaluated this source category to determine if there are any feasible emission reduction opportunities. This extensive effort included the evaluation of this rule compared to analogous rules, policies, and procedures in other air districts, and identified potential emission reduction opportunities. The District found that Rule 4570 currently has in place the most stringent measures feasible to implement in the Valley.⁴⁴ This determination is further supported by the District's 2009 RACT SIP demonstration report⁴⁵ and the District's 2013 Plan for the Revoked 1-hour Ozone Standard,⁴⁶ as approved by EPA.⁴⁷ The District re-evaluated the aforementioned options and has determined that no additional feasible opportunities have been developed in the last 12 months since the adoption of the *2015 PM_{2.5} Plan*. Therefore, there are no additional emission reduction opportunities at this time.

C.24.7 Evaluation Findings

Rule 4570 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

⁴⁴ SJVAPCD. *2015 Plan for the 1997 PM_{2.5} Standard*. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

⁴⁵ SJVAPCD. *Reasonably Available Control Technology Demonstration for Ozone State Implementation Plans*. (2009, April 16). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/docs/RACTSIP-2009.pdf

⁴⁶ SJVAPCD. *2013 Plan for the Revoked 1-Hour Ozone Standard*. (2013, September 19). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁴⁷ EPA. *Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California*; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

C.25 RULE 4601 ARCHITECTURAL COATINGS

C.25.1.1.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	8.24	8.37	8.72	9.11	9.57	9.99	10.27	10.47	10.60

C.25.2 District Rule 4601 Description

District Rule 4601 was adopted on April 11, 1991 and has been subsequently amended five times. This rule reduces VOC emissions from sources subject to this rule by establishing VOC content limits for architectural coatings. Rule 4601 is applicable to any person who supplies, sells, offers for sale, applies, or solicits the application of any architectural coating, or who manufactures, blends, or repackages any architectural coating for use within the District. The purpose of this rule is to limit VOC emissions from these sources.

C.25.3 How does District Rule 4601 compare with federal rules and regulations?

C.25.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.25.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.25.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.25.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.25.4 How does District Rule 4601 compare with California State regulations?

Rule 4601 is at least as stringent as the applicable ARB Suggested Control Measure (SCM) for Architectural Coatings, promulgated in September 2007. ARB's adoption of the SCM established consistent VOC content standards for architectural coatings used in California based on multiple years of public processes, which included exhaustive research and collaborative efforts between ARB and coating manufacturers.

C.25.5 How does District Rule 4601 compare to regulations from other air districts?

C.25.5.1 Bay Area AQMD

C.25.5.1.1 Regulation 8 Rule 3 (Architectural Coatings)

The requirements in Rule 4601 are as stringent as or more stringent than those in Rule 8-3.

C.25.5.2 Sacramento Metro AQMD

C.25.5.2.1 Rule 442 (Architectural Coatings)

The requirements in Rule 4601 are as stringent as or more stringent than those in Rule 442.

C.25.5.3 South Coast AQMD

C.25.5.3.1 Rule 1113 (Architectural Coatings)

The requirements in Rule 4601 are as stringent as or more stringent than those in Rule 1113. While there are some limits within the rule that go beyond RACT, the District is implementing the most stringent limits feasible given the Valley's unique characteristics. This determination is further supported by the District's 2009 RACT SIP demonstration report⁴⁸ and the District's 2013 Plan for the Revoked 1-hour Ozone Standard,⁴⁹ as approved by EPA.⁵⁰

C.25.5.4 Ventura County APCD

C.25.5.4.1 Rule 74.2 (Architectural Coatings)

The requirements in Rule 4601 are as stringent as or more stringent than those in Rule 74.2.

C.25.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.25.7 Evaluation Findings

According to the federal CAA §182(b)(2) and (f) this source category is not subject to federal RACT requirements because this source category has no sources subject to EPA CTGs and these sources are not "major sources" of VOCs and NOx, as confirmed by EPA in the Technical Support Document (TSD) for the partial approval of the

⁴⁸ SJVAPCD. *Reasonably Available Control Technology Demonstration for Ozone State Implementation Plans*. (2009, April 16). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/docs/RACTSIP-2009.pdf

⁴⁹ SJVAPCD. *2013 Plan for the Revoked 1-Hour Ozone Standard*. (2013, September 19). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁵⁰ EPA. *Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California*; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

Districts 2009 RACT SIP.⁵¹ However, pursuant to the District's No Stone Left Unturned philosophy, Rule 4601 was evaluated as a part of this plan development effort.

Rule 4601 currently has in place the most stringent measures feasible to implement in the Valley. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

⁵¹ U.S. EPA. Region IX Air Division. Technical Support Document for EPA's Notice of Proposed Rulemaking for the California State Implementation Plan. Prepared by Stanley Tong. (2011, August 29). <https://www.regulations.gov/#!documentDetail;D=EPA-R09-OAR-2011-0723-0006>

C.26 RULE 4602 MOTOR VEHICLE ASSEMBLY COATINGS

C.26.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	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	0.00

The emissions inventory for this source category is 0.00 tpd because there are no facilities operating in the Valley.

C.26.2 District Rule 4602 Description

This rule is applicable to any person who applies VOC-containing coatings to new automobiles, light-duty trucks, heavier vehicles, and other parts coated along with these bodies or body parts during the assembly process and associated solvent cleaning activities. The purpose of this rule is to limit VOC emissions from motor vehicle assembly coating operations.

There are currently no motor vehicle assembly operations in the Valley. Any such facilities beginning operation in the Valley in the future would be required to meet District BACT requirements, per District Rules 2201 (New and Modified Stationary Source Review Rule), which by definition are equal to or more stringent than RACT, and 4001 (New Source Performance Standards).

C.26.3 How does District Rule 4602 compare with federal rules and regulations?

C.26.3.1 EPA – Control Technique Guidelines (CTG)

C.26.3.1.1 CTG - EPA 453/R-08-006 Control Techniques Guidelines for Automobile and Light-Duty Truck Assembly Coatings

Rule 4602 implements EPA CTG requirements and therefore is as stringent as the applicable CTG requirements.

C.26.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.26.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.26.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.26.4 How does District Rule 4602 compare with California State regulations?

There are no state regulations applicable to this source category.

C.26.5 How does District Rule 4602 compare to regulations from other air districts?**C.26.5.1 Bay Area AQMD**

Bay Area AQMD has no analogous rules for this source category.

C.26.5.2 Sacramento Metro AQMD

Sacramento Metro AQMD has no analogous rules for this source category.

C.26.5.3 South Coast AQMD

South Coast AQMD has no analogous rules for this source category.

C.26.5.4 Ventura County APCD

Ventura County APCD has no analogous rules for this source category.

C.26.6 Potential Emission Reduction Opportunities

There are no motor vehicle assembly operations in the Valley; there are no emissions or emission reduction opportunities for this source category.

C.26.7 Evaluation Findings

There are no motor vehicle assembly operations in the Valley; there are no emissions or emission reduction opportunities for this source category.

C.27 RULE 4603 SURFACE COATING OF METAL PARTS AND PRODUCTS, PLASTIC PARTS AND PRODUCTS, AND PLEASURE CRAFTS

C.27.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	1.00	1.10	1.17	1.25	1.32	1.38	1.42	1.44	1.44

C.27.2 District Rule 4603 Description

The provisions of this rule apply to the surface coating of metal parts or products, large appliances' parts or products, metal furniture, plastic parts and products, and pleasure crafts, and to the organic solvent cleaning and storage and disposal of all solvents and waste solvent materials associated with such coatings. The purpose of this rule is to limit VOC emissions from these coatings.

C.27.3 How does District Rule 4603 compare with federal rules and regulations?

Rule 4603 is at least as stringent as the applicable federal CTG, ACT, NSPS, MACT, and NESHAP since the requirements have not been strengthened for these regulations since the Rule 4603 RACT approval.

C.27.3.1 EPA – Control Technique Guidelines (CTG)

C.27.3.1.1 CTG – EPA-453/R-07-004 (Control Techniques Guidelines for Large Appliance Coatings)

The requirements of Rule 4603 are more stringent than the requirements in the CTG.

C.27.3.1.2 CTG – EPA-453/R-07-005 (Control Techniques Guidelines for Metal Furniture Coatings)

The requirements of Rule 4603 are more stringent than the requirements in the CTG.

C.27.3.1.3 CTG – EPA-450/2-78-015 (Control of Volatile Organic Emissions from Existing Stationary Sources – Volume VI: Surface Coating of Miscellaneous Metal Parts and Products)

The requirements of Rule 4603 are more stringent than the requirements in the CTG.

C.27.3.1.4 CTG – EPA-453/R-08-003 (Control Techniques Guidelines for Miscellaneous Metal and Plastic Parts Coatings)

The requirements of Rule 4603 are more stringent than the requirements in the CTG.

C.27.3.2 EPA – Alternative Control Technology (ACT)**C.27.3.2.1 ACT – EPA-453/R-94-015 (Alternative Control Techniques Document – Industrial Cleaning Solvents)**

The requirements of Rule 4603 are more stringent than the requirements in the ACT.

C.27.3.3 Standards of Performance for New Stationary Sources (NSPS)**C.27.3.3.1 NSPS – 40 CFR 60 Subpart EE (Surface Coating of Metal Furniture)**

The requirements of Rule 4603 are more stringent than the requirements in the NSPS.

C.27.3.3.2 NSPS – 40 CFR 60 Subpart SS (Industrial Surface Coating of Large Appliances)

The requirements of Rule 4603 are more stringent than the requirements in the NSPS.

C.27.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)**C.27.3.4.1 NESHAP/MACT – 40 CFR Part 63 Subpart MMMM (NESHAP for Surface Coating of Miscellaneous Metal Parts and Products).**

The requirements of Rule 4603 are more stringent than the requirements in the NESHAP.

C.27.3.4.2 NESHAP/MACT – 40 CFR Part 63 Subpart NNNN (NESHAP for Surface Coating of Large Appliances)

The requirements of Rule 4603 are more stringent than the requirements in the NESHAP.

C.27.3.4.3 NESHAP/MACT – 40 CFR Part 63 Subpart RRRR (NESHAP for Surface Coating of Metal Furniture)

The requirements of Rule 4603 are more stringent than the requirements in the NESHAP.

C.27.4 How does District Rule 4603 compare with California State regulations?

There are no state regulations applicable to this source category.

C.27.5 How does District Rule 4603 compare to regulations from other air districts?**C.27.5.1 Bay Area AQMD**

C.27.5.1.1 Regulation 8 Rule 14 (Surface Coating of Large Appliances and Metal Furniture)

The requirements in Rule 4603 are as stringent as or more stringent than those in Rule 8-14

C.27.5.1.2 Regulation 8 Rule 19 (Surface Coating of Miscellaneous Parts and Products)

The requirements in Rule 4603 are as stringent as or more stringent than those in Rule 8-19.

C.27.5.2 Sacramento Metro AQMD**C.27.5.2.1 SMAQMD Rule 451 (Surface Coating of Miscellaneous Metal Parts and Products)**

SMAQMD Rule 451 was amended in 2010, but the rule requirements are not more stringent than the requirements in Rule 4603.

C.27.5.3 South Coast AQMD**C.27.5.3.1 SCAQMD Rule 1106.1 (Pleasure Craft Coating Operations)**

The requirements in Rule 4603 are as stringent as or more stringent than those in Rule 1106.1.

C.27.5.3.2 SCAQMD Rule 1107 (Coating of Metal Parts and Products)

The requirements in Rule 4603 are as stringent as or more stringent than those in Rule 1107.

C.27.5.4 Ventura County APCD**C.27.5.4.1 Rule 74.12 (Surface Coatings of Metal Parts and Products)**

The requirements in Rule 4603 are as stringent as or more stringent than those in Rule 74.12.

C.27.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.27.7 Evaluation Findings

Rule 4603 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category.

C.28 RULE 4604 CAN AND COIL COATING OPERATIONS

C.28.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.31	0.33	0.35	0.37	0.39	0.40	0.42	0.43	0.43

C.28.2 District Rule 4604 Description

This rule applies to can and coil coating operations and to organic solvent cleaning, storage, and disposal associated with can and coil coating operations. The purpose of this rule is to limit VOC emissions from these operations.

C.28.3 How does District Rule 4604 compare with federal rules and regulations?

C.28.3.1 EPA – Control Technique Guidelines (CTG)

C.28.3.1.1 CTG–EPA-450/2-77-022 (Control of Volatile Organic Emissions from Existing Stationary Sources – Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks)

The requirements of Rule 4604 are more stringent than the requirements in the CTG.

C.28.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.28.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.28.3.3.1 NSPS – 40 CFR 60 Subpart TT (Standards of Performance for Metal Coil Surface Coating)

The requirements of Rule 4604 are more stringent than the requirements in the NSPS.

C.28.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.28.3.4.1 NESHAP/MACT – 40 CFR 63 Subpart KKK (National Emission Standards for HAPs: Surface Coating of Metal Cans)

The requirements of Rule 4604 are more stringent than the requirements in the NESHAP/MACT.

C.28.3.4.2 NESHAP/MACT – 40 CFR 63 Subpart SSSS (National Emission Standards for HAPs: Surface Coating of Metal Coil)

The requirements of Rule 4604 are more stringent than the requirements in the NESHAP.

C.28.4 How does District Rule 4604 compare with California State regulations?

There are no state regulations applicable to this source category.

C.28.5 How does District Rule 4604 compare to regulations from other air districts?**C.28.5.1 Bay Area AQMD****C.28.5.1.1 Regulation 8 Rule 11 (Metal Container, Closure and Coil Coating)**

The requirements in Rule 4604 are as stringent as or more stringent than those in Rule 8-11.

C.28.5.2 Sacramento Metro AQMD**C.28.5.2.1 Rule 452 (Can Coating)**

The requirements in Rule 4604 are as stringent as or more stringent than those in Rule 452.

C.28.5.3 South Coast AQMD**C.28.5.3.1 Rule 1125 (Metal Container, Closure, and Coil Coating Operations)**

The requirements in Rule 4604 are as stringent as or more stringent than those in Rule 1125.

C.28.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.28.6 Potential Emission Reduction Opportunities

There are BACT guidelines that are more stringent than what is required in Rule 4604. However, these requirements are beyond RACT and not technologically feasible or cost effective for all sources applicable to Rule 4604. This determination is further supported by the District's 2013 Plan for the Revoked 1-hour Ozone Standard, as approved by EPA.⁵²

⁵² EPA. *Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California*; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

C.28.7 Evaluation Findings

Rule 4604 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.29 RULE 4605 AEROSPACE ASSEMBLY AND COMPONENT COATING OPERATIONS

C.29.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

C.29.2 District Rule 4605 Description

This rule applies to the manufacturing, assembling, coating, masking, bonding, paint stripping, surface cleaning, service, and maintenance of aerospace components; the cleanup of equipment; and the storage and disposal of solvents and waste solvent materials associated with these operations. The purpose of this rule is to limit the emissions of VOCs from these sources.

C.29.3 How does District Rule 4605 compare with federal rules and regulations?

C.29.3.1 EPA – Control Technique Guidelines (CTG)

C.29.3.1.1 CTG – EPA-453/R-97-004 (Control of Volatile Organic Compound Emissions from Coating Operations at Aerospace Manufacturing and Rework Operations)

The requirements of Rule 4605 are more stringent than the requirements in the CTG.

C.29.3.1.2 CTG – EPA-450/2-77-022 (Control of Volatile Organic Emissions from Solvent Metal Cleaning)

The requirements of Rule 4605 are as stringent as or more stringent than the requirements in the CTG.

C.29.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.29.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.29.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)**C.29.3.4.1 NESHAP/MACT – 40 CFR 63 Subpart GG (National Emission Standards for HAPs: Aerospace Manufacturing and Rework Facilities)**

The requirements of Rule 4605 are more stringent than the requirements in the NESHAP/MACT.

C.29.4 How does District Rule 4605 compare with California State regulations?

There are no state regulations applicable to this source category.

C.29.5 How does District Rule 4605 compare to regulations from other air districts?**C.29.5.1 Bay Area AQMD****C.29.5.1.1 Regulation 8 Rule 29 (Aerospace Assembly and Component Coating Operations)**

The requirements in Rule 4605 are as stringent as or more stringent than those in Rule 8-29.

C.29.5.2 Sacramento Metro AQMD**C.29.5.2.1 SMAQMD Rule 456 (Aerospace Coating Operations)**

The requirements in Rule 4605 are as stringent as or more stringent than those in Rule 456.

C.29.5.3 South Coast AQMD**C.29.5.3.1 Rule 1124 (Aerospace Assembly and Component Manufacturing Operations)**

The requirements in Rule 4605 are as stringent as or more stringent than those in Rule 1124.

C.29.5.4 Ventura County APCD**C.29.5.4.1 Rule 74.13 (Aerospace Assembly and Component Manufacturing Operations)**

The requirements in Rule 4605 are more stringent than those in Rule 74.13.

C.29.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.29.7 Evaluation Findings

Rule 4605 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.30 RULE 4606 WOOD PRODUCTS AND FLAT WOOD PANELING PRODUCTS COATING OPERATIONS

C.30.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	1.47	1.60	1.73	1.80	1.91	1.98	2.07	2.10	2.10

C.30.2 District Rule 4606 Description

This rule applies to the application of coatings to wood products, including furniture, cabinets, flat wood paneling, and custom replica furniture. The rule also applies to organic solvent cleaning, and to the storage and disposal of all solvents and waste solvent materials associated with such coating operations. The purpose of this rule is to limit the emissions of VOCs from these operations.

C.30.3 How does District Rule 4606 compare with federal rules and regulations?

C.30.3.1 EPA – Control Technique Guidelines (CTG)

C.30.3.1.1 CTG – EPA-453/R-96-007 (Control of Volatile Organic Compound Emissions from Wood Furniture Manufacturing Operations)

The requirements of Rule 4606 are as stringent as or more stringent than the requirements in the CTG.

C.30.3.1.2 CTG – EPA-453/R-06-004 (Control Techniques Guidelines for Flat Wood Paneling Coatings)

The requirements of Rule 4606 are as stringent as or more stringent than the requirements in the CTG.

C.30.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.30.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.30.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.30.3.4.1 NESHAP/MACT – 40 CFR 63 Subpart JJ (National Emission Standards for Wood Furniture Manufacturing)

The requirements of Rule 4606 are more stringent than the requirements in the NESHAP.

C.30.4 How does District Rule 4606 compare with California State regulations?

There are no state regulations applicable to this source category.

C.30.5 How does District Rule 4606 compare to regulations from other air districts?

C.30.5.1 Bay Area AQMD

C.30.5.1.1 Regulation 8 Rule 32 (Wood Products Coatings)

Regulation 8 Rule 32 was amended in 2009 to include VOC limits that go beyond RACT for “Custom and Contract Furniture.” EPA’s partial approval of the 2009 RACT SIP, which includes Rule 4606, further demonstrates that the BAAQMD limits are beyond RACT.

C.30.5.2 Sacramento Metro AQMD

C.30.5.2.1 Rule 463 (Wood Product Coatings)

The requirements in Rule 4606 are as stringent as or more stringent than those in Rule 463.

C.30.5.3 South Coast AQMD

C.30.5.3.1 Rule 1136 (Wood Product Coatings)

The requirements in Rule 4606 are as stringent as or more stringent than those in Rule 1136.

C.30.5.3.2 Rule 1104 (Wood Flat Stock Coating Operations)

The requirements in Rule 4606 are as stringent as or more stringent than those in Rule 1104.

C.30.5.4 Ventura County APCD**C.30.5.4.1 Rule 74.30 (Wood Products Coatings)**

The requirements in Rule 4606 are as stringent as or more stringent than those in Rule 74.30.

C.30.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.30.7 Evaluation Findings

Rule 4606 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.31 RULE 4607 GRAPHIC ARTS AND PAPER FILM, FOIL, AND FABRIC COATINGS

C.31.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	5.18	5.48	5.76	6.05	6.33	6.66	6.87	6.98	6.98

C.31.2 District Rule 4607 Description

This rule is applicable to graphic arts printing operations; digital printing operations; paper, film, foil, or fabric coating operations; and the organic solvent cleaning materials and processes associated with such operations. The purpose of this rule is to limit VOC emissions from these operations.

C.31.3 How does District Rule 4607 compare with federal rules and regulations?

C.31.3.1 EPA – Control Technique Guidelines (CTG)

C.31.3.1.1 CTG – EPA-450/2-77-008 (Control of Volatile Organic Emissions from Existing Stationary Sources – Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks)

The requirements of Rule 4607 are as stringent as or more stringent than the requirements in the CTG.

C.31.3.1.2 CTG – EPA-450/2-78-033 (Control Techniques Guidelines for Control of VOCs from Existing Stationary Sources – Volume VIII: Graphic Arts- Rotogravure and Flexography)

The requirements of Rule 4607 are as stringent as or more stringent than the requirements in the CTG.

C.31.3.1.3 CTG – EPA-453/R-06-002 (Control Techniques Guidelines for Offset Lithographic Printing and Letterpress Printing)

The requirements of Rule 4607 are as stringent as or more stringent than the requirements in the CTG.

C.31.3.1.4 CTG – EPA-453/R-06-003 (Control Techniques Guidelines for Flexible Package Printing)

The requirements of Rule 4607 are as stringent as or more stringent than the requirements in the CTG.

C.31.3.1.5 CTG – EPA-453/R-07-003 (Control Techniques Guidelines for Paper, Film, and Foil Coatings)

The requirements of Rule 4607 are as stringent as or more stringent than the requirements in the CTG.

C.31.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.31.3.3 Standards of Performance for New Stationary Sources (NSPS)**C.31.3.3.1 NSPS – 40 CFR 60 Subpart QQ (Standards of Performance for the Graphic Arts Industry: Publication Rotogravure Printing)**

The requirements of Rule 4607 are as stringent as or more stringent than the requirements in the NSPS.

C.31.3.3.2 NSPS – 40 CFR 60 Subpart RR- Standards of Performance for Pressure Sensitive Tape and Label Surface Coating Operations)

The requirements of Rule 4607 are as stringent as or more stringent than the requirements in the NSPS.

C.31.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)**C.31.3.4.1 NESHAP/MACT – 40 CFR 63 Subpart KK (National Emission Standards for the Printing and Publishing Industry)**

The requirements of Rule 4607 are as stringent as or more stringent than the requirements in the NESHAP/MACT.

C.31.3.4.2 NESHAP/MACT – 40 CFR 63 Subpart JJJJ (National Emission Standards for Hazardous Air Pollutants: Paper and Other Web Coating)

The requirements of Rule 4607 are as stringent as or more stringent than the requirements in the NESHAP/MACT.

C.31.3.4.3 NESHAP/MACT – 40 CFR 63 Subpart OOOO (National Emission Standards for Hazardous Air Pollutants: Printing, Coating, and Dyeing of Fabrics and Other Textiles)

The requirements of Rule 4607 are as stringent as or more stringent than the requirements in the NESHAP/MACT.

C.31.4 How does District Rule 4607 compare with California State regulations?

There are no state regulations applicable to this source category.

C.31.5 How does District Rule 4607 compare to regulations from other air districts?

C.31.5.1 Bay Area AQMD

C.31.5.1.1 Regulation 8 Rule 4 (General Solvent and Surface Coating Operations)

The requirements in Rule 4607 are as stringent as or more stringent than those in Rule 8-4.

C.31.5.1.2 Regulation 8 Rule 12 (Paper, Fabric and Film Coating)

The requirements in Rule 4607 are as stringent as or more stringent than those in Rule 8-12.

C.31.5.1.3 Regulation 8 Rule 20 (Graphic Arts Printing and Coating Operations)

The requirements in Rule 4607 are as stringent as or more stringent than those in Rule 8-20.

C.31.5.2 Sacramento Metro AQMD

C.31.5.2.1 Rule 450 (Graphic Arts Operations)

The requirements in Rule 4607 are as stringent as or more stringent than those in Rule 450.

C.31.5.3 South Coast AQMD

C.31.5.3.1 Rule 1128 (Paper, Fabric, and Film Coating Operations)

The requirements in Rule 4607 are as stringent as or more stringent than those in Rule 1128.

C.31.5.3.2 Rule 1130 (Graphic Arts)

The requirements in Rule 4607 are as stringent as or more stringent than those in Rule 1130.

C.31.5.3.3 Rule 1130.1 (Screen Printing Operations)

The requirements in Rule 4607 are as stringent as or more stringent than those in Rule 1130.1.

C.31.5.3.4 Rule 1171 (Solvent Cleaning Operations)

The requirements in Rule 4607 are as stringent as or more stringent than those in Rule 1171.

C.31.5.4 Ventura County APCD**C.31.5.4.1 Rule 74.19 (Graphic Arts)**

The requirements in Rule 4607 are as stringent as or more stringent than those in Rule 74.19.

C.31.5.4.2 Rule 74.19.1 (Screen Printing Operations)

The requirements in Rule 4607 are as stringent as or more stringent than those in Rule 74.19.1.

C.31.5.4.3 Rule 74.3 (Paper, Fabric, and Film Coating Operations)

The requirements in Rule 4607 are as stringent as or more stringent than those in Rule 74.3.

C.31.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.31.7 Evaluation Findings

Rule 4607 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.32 RULE 4610 GLASS COATING OPERATIONS

C.32.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
VOC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

The emissions from this rule are accounted for in the discussion for Rule 4354 (Glass Melting Furnaces).

C.32.2 District Rule 4610 Description

The requirements of this rule apply to any major source that coats glass products with VOC-containing materials. The purpose of this rule is to limit the emissions of VOCs from the coating of glass products. There are only two glass coating operations in the District, and neither emits enough VOCs to be considered a major source.

C.32.3 How does District Rule 4610 compare with federal rules and regulations?

C.32.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.32.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.32.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.32.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.32.4 How does District Rule 4610 compare with California State regulations?

There are no state regulations applicable to this source category.

C.32.5 How does District Rule 4610 compare to regulations from other air districts?

C.32.5.1 Bay Area AQMD

C.32.5.1.1 Regulation 8 Rule 4 (General Solvent and Surface Coating Operations)

The requirements in Rule 46010 are as stringent as or more stringent than those in Rule 8-4.

C.32.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.32.5.3 South Coast AQMD

C.32.5.3.1 SCAQMD Rule 1145 (Plastic, Rubber, Leather, and Glass Coatings)

SCAQMD adopted VOC limits in Rule 1145 that go beyond RACT for one-component, two-component, optical, and mirror backed roll coatings. This determination is further supported by the District's 2009 RACT SIP demonstration report⁵³ and the District's 2013 Plan for the Revoked 1-hour Ozone Standard,⁵⁴ as approved by EPA.⁵⁵

C.32.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.32.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.32.7 Evaluation Findings

Rule 4610 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

⁵³ SJVAPCD. *Reasonably Available Control Technology Demonstration for Ozone State Implementation Plans*. (2009, April 16). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/docs/RACTSIP-2009.pdf

⁵⁴ SJVAPCD. *2013 Plan for the Revoked 1-Hour Ozone Standard*. (2013, September 19). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁵⁵ EPA. *Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California*; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

C.33 RULE 4612 MOTOR VEHICLE AND MOBILE EQUIPMENT COATING OPERATIONS

C.33.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	1.53	1.57	1.59	1.56	1.59	1.62	1.64	1.65	1.65

C.33.2 District Rule 4612 Description

This rule applies to any person who supplies, sells, offers for sale, manufactures, or distributes any automotive coating for use within the District, as well as any person who uses, applies, or solicits the use or application of any automotive coating within the District. The purpose of this rule is to limit VOC emissions from coatings of motor vehicles, mobile equipment, and associated parts and components, and associated organic solvent cleaning, storage, and disposal.

C.33.3 How does District Rule 4612 compare with federal rules and regulations?

C.33.3.1 EPA – Control Technique Guidelines (CTG)

C.33.3.1.1 CTG – EPA-450/2-76-028 (Control of Volatile Organic Emissions from Existing Stationary Sources – Volume I: Control Methods for Surface Coating Operations)

The requirements of Rule 4612 are as stringent as or more stringent than the requirements in the CTG.

C.33.3.1.2 CTG – EPA-450/2-77-008 (Control of Volatile Organic Emissions from Existing Stationary Sources – Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks)

The requirements of Rule 4612 are as stringent as or more stringent than the requirements in the CTG.

C.33.3.1.3 CTG – EPA-453/R-08-006 (Control Techniques Guidelines for Automobile and Light-Duty Truck Assembly Coatings)

The requirements of Rule 4612 are as stringent as or more stringent than the requirements in the CTG.

C.33.3.2 EPA – Alternative Control Technology (ACT)

C.33.3.2.1 ACT – EPA-453/R-94-017 (Alternative Control Techniques Document – Surface Coating of Automotive/Transportation and Business Machine Plastic Parts)

The requirements of Rule 4612 are as stringent as or more stringent than the requirements in the ACT.

C.33.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.33.3.3.1 NSPS – 40 CFR 60 Subpart MM (Standards of Performance for Automobile and Light-Duty Truck Surface Coating Operations)

The requirements of Rule 4612 are as stringent as or more stringent than the requirements in the NSPS.

C.33.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.33.3.4.1 NESHAP/MACT - 40 CFR 63 Subpart IIII (National Emission Standards for HAPs: Surface Coating of Automobiles and Light-Duty Trucks)

The requirements of Rule 4612 are as stringent as or more stringent than the requirements in the NESHAP/MACT.

C.33.4 How does District Rule 4612 compare with California State regulations?

C.33.4.1.1 ARB SCM for Automotive Coatings

The ARB SCM was adopted on October 20, 2005 and has not been updated since. Rule 4612 is as stringent as or more stringent than the requirements in the ARB SCM.

C.33.5 How does District Rule 4612 compare to regulations from other air districts?

C.33.5.1 Bay Area AQMD

C.33.5.1.1 Regulation 8 Rule 45 (Motor Vehicle and Mobile Equipment Coating Operations)

The requirements of Rule 4612 are as stringent as or more stringent than the requirements in Rule 8-45. SCAQMD Rule 1151 and BAAQMD Regulation 8 Rule 45 were last amended before the 2009 RACT SIP was compiled. These rules contain VOC limits that go beyond RACT for two categories (Pre-Coat and Topcoat–Metallic/Iridescent). EPA’s partial approval of the 2009 RACT SIP, which includes Rule 4612, further demonstrates that the SCAQMD and BAAQMD limits are beyond RACT.

This determination is further supported by the District's 2013 Plan for the Revoked 1-hour Ozone Standard,⁵⁶ as approved by EPA.⁵⁷

C.33.5.2 Sacramento Metro AQMD

C.33.5.2.1 SMAQMD Rule 459 (Automotive, Mobile Equipment, and Associated Parts and Components Coating Operations)

The requirements of Rule 4612 are as stringent as or more stringent than Rule 459.

C.33.5.3 South Coast AQMD

C.33.5.3.1 Rule 1151 (Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations)

The requirements of Rule 4612 are as stringent as or more stringent than the requirements in Rule 1151. SCAQMD Rule 1151 and BAAQMD Regulation 8 Rule 45 were last amended before the 2009 RACT SIP was compiled. These rules contain VOC limits that go beyond RACT for two categories (Pre-Coat and Topcoat–Metallic/Iridescent). EPA's partial approval of the 2009 RACT SIP, which includes Rule 4612, further demonstrates that the SCAQMD and BAAQMD limits are beyond RACT. This determination is further supported by the District's 2013 Plan for the Revoked 1-hour Ozone Standard,⁵⁸ as approved by EPA.⁵⁹

C.33.5.4 Ventura County APCD

C.33.5.4.1 VCAPCD Rule 74.18 (Motor Vehicle and Mobile Equipment Coating Operations)

The requirements of Rule 4612 are as stringent as or more stringent than the requirements in Rule 74.18.

C.33.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.33.7 Evaluation Findings

Rule 4612 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source

⁵⁶ SJVAPCD. 2013 Plan for the Revoked 1-Hour Ozone Standard. (2013, September 19). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁵⁷ EPA. Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

⁵⁸ SJVAPCD. 2013 Plan for the Revoked 1-Hour Ozone Standard. (2013, September 19). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁵⁹ EPA. Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.34 RULE 4621 GASOLINE TRANSFER INTO STATIONARY STORAGE CONTAINERS, DELIVERY VESSELS, AND BULK PLANTS

C.34.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	1.53	1.57	1.59	1.56	1.59	1.62	1.64	1.65	1.65

C.34.2 District Rule 4621 Description

Rule 4621 applies to all operations that transfer gasoline between delivery vessels and storage containers and loading racks that are used to load organic liquids with a True Vapor Pressure of 1.5 psi or greater. The purpose of this rule is to limit VOC emissions from stationary storage containers, delivery vessels, and bulk plants.

C.34.3 How does District Rule 4621 compare with federal rules and regulations?

C.34.3.1 EPA – Control Technique Guidelines (CTG)

C.34.3.1.1 EPA-450/2-77-026 Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals

The requirements of Rule 4621 are as stringent as or more stringent than the requirements in the CTG.

C.34.3.1.2 EPA-450/2-77-035 Control of Volatile Organic Emissions from Bulk Gasoline Plants

The requirements of Rule 4621 are as stringent as or more stringent than the requirements in the CTG.

C.34.3.1.3 EPA-450/2-78-051 Guideline for Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection Systems

The requirements of Rule 4621 are as stringent as or more stringent than the requirements in the CTG.

C.34.3.2 EPA – Alternative Control Technology (ACT)

C.34.3.2.1 EPA-450/R-75-102 Alternative Control Technology Document for Stage I Vapor Control Systems on Gasoline Service Stations

The requirements of Rule 4621 are more stringent than the requirements in the ACT.

C.34.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.34.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.34.4 How does District Rule 4621 compare with California State regulations?

Rule 4621 aligns with ARB's certified Recovery System requirements.

C.34.5 How does District Rule 4621 compare to regulations from other air districts?

C.34.5.1 Bay Area AQMD

C.34.5.1.1 Regulation 8 Rule 7 (Gasoline Dispensing Facilities)

The requirements in Rule 4621 are as stringent as or more stringent than those in Rule 8-7.

C.34.5.1.2 Regulation 8 Rule 39 (Gasoline Bulk Plants and Gasoline Deliver Vehicles)

The requirements in Rule 4621 are as stringent as or more stringent than those in Rule 8-39.

C.34.5.2 Sacramento Metro AQMD

C.34.5.2.1 SMAQMD Rule 448 (Gasoline Storage Containers)

The requirements in Rule 4621 are as stringent as or more stringent than those in Rule 448.

C.34.5.3 South Coast AQMD

C.34.5.3.1 SCAQMD Rule 461 (Gasoline Transfer and Dispensing)

The requirements in Rule 4621 are more as stringent as or stringent than those in Rule 461.

C.34.5.4 Ventura County APCD

C.34.5.4.1 Ventura County APCD Rule 70 (Storage and Transfer of Gasoline)

The requirements in Rule 4621 are as stringent as or more stringent than those in Rule 70.

C.34.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.34.7 Evaluation Findings

Rule 4621 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.35 RULE 4622 GASOLINE TRANSFER INTO MOTOR VEHICLE FUEL TANKS

C.35.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	1.81	1.68	1.56	1.48	1.46	1.46	1.48	1.49	1.48

C.35.2 District Rule 4622 Description

This rule applies to any gasoline storage and dispensing operation or mobile fueler from which gasoline is transferred into motor vehicle fuel tanks. The purpose of this rule is to limit emissions of gasoline vapors from these sources.

C.35.3 How does District Rule 4622 compare with federal rules and regulations?

C.35.3.1 EPA – Control Technique Guidelines (CTG)

C.35.3.1.1 CTG - EPA-450/2-78-051 (Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection Systems)

The requirements of Rule 4622 are as stringent as or more stringent than the requirements in the CTG.

C.35.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.35.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.35.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.35.3.4.1 NESHAP/MACT - 40 CFR Subpart 63 CCCCCC (National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities)

The requirements of Rule 4622 are as stringent as or more stringent than the requirements in the NESHAP/MACT.

C.35.4 How does District Rule 4622 compare with California State regulations?

There are no state regulations applicable to this source category.

C.35.5 How does District Rule 4622 compare to regulations from other air districts?**C.35.5.1 Bay Area AQMD****C.35.5.1.1 Regulation 8 Rule 7 (Gasoline Dispensing Facilities)**

The requirements in Rule 4622 are as stringent as or more stringent than those in Rule 8-7.

C.35.5.2 Sacramento Metro AQMD**C.35.5.2.1 SMAQMD Rule 449 (Transfer of Gasoline into Vehicle Fuel Tanks)**

The requirements in Rule 4621 are more as stringent as or stringent than those in Rule 449.

C.35.5.3 South Coast AQMD**C.35.5.3.1 SCAQMD Rule 461 (Gasoline Transfer and Dispensing)**

The requirements in Rule 4621 are more as stringent as or stringent than those in Rule 461.

C.35.5.4 Ventura County APCD**C.35.5.4.1 VCAPCD Rule 70 (Storage and Transfer of Gasoline)**

The requirements in Rule 4622 are as stringent as or more stringent than those in Rule 70.

C.35.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.35.7 Evaluation Findings

Rule 4622 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.36 RULE 4623 STORAGE OF ORGANIC LIQUIDS

C.36.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
VOC	2.72	2.58	2.44	2.32	2.20	2.08	2.01	1.99	1.95

C.36.2 District Rule 4623 Description

This rule applies to any tank with a capacity of 1,100 gallons or greater in which any organic liquid is placed, held, or stored. The purpose of this rule is to limit VOC emissions from the storage of organic liquids.

C.36.3 How does District Rule 4623 compare with federal rules and regulations?

C.36.3.1 EPA – Control Technique Guidelines (CTG)

C.36.3.1.1 CTG – EPA-450/2-77-036 (Control Techniques Guideline Document for Control of Volatile Organic Emissions from Storage of Petroleum Liquids in Fixed Roof Tanks)

The requirements of Rule 4623 are as stringent as or more stringent than the requirements in the CTG.

C.36.3.1.2 CTG – EPA-450/2-78-047 (Control Techniques Guideline Document for Control of Volatile Organic Emissions from Petroleum Liquid Storage in External Floating Roof Tanks)

The requirements of Rule 4623 are as stringent as or more stringent than the requirements in the CTG.

C.36.3.2 EPA – Alternative Control Technology (ACT)

C.36.3.2.1 ACT – EPA 453/R-94-001 (Alternative Control Techniques Document for Volatile Organic Liquid Storage in Floating and Fixed Roof Tanks)

The requirements of Rule 4623 are as stringent as or more stringent than the requirements in the ACT.

C.36.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.36.3.3.1 NSPS – 40 CFR 60 Subpart Kb (a)(3)(i) (Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984)

The requirements in Rule 4621 are more as stringent as or stringent than those in the NSPS.

C.36.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.36.4 How does District Rule 4623 compare with California State regulations?

There are no state regulations applicable to this source category.

C.36.5 How does District Rule 4623 compare to regulations from other air districts?

C.36.5.1 Bay Area AQMD

C.36.5.1.1 Regulation 8 Rule 5 (Storage of Organic Liquids)

The requirements in Rule 4623 are as stringent as or more stringent than those in Rule 8-5.

C.36.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.36.5.3 South Coast AQMD

C.36.5.3.1 South Coast Rule 463 (Organic Liquid Storage)

The requirements in Rule 4623 are as stringent as or more stringent than those in Rule 463. This determination is further supported by the District's 2013 Plan for the Revoked 1-hour Ozone Standard,⁶⁰ as approved by EPA.⁶¹

C.36.5.4 Ventura County APCD

C.36.5.4.1 Rule 71.2 (Storage of Reactive Organic Compound Liquids)

The requirements in Rule 4623 are as stringent as or more stringent than those in Rule 71.2

⁶⁰ SJVAPCD. 2013 Plan for the Revoked 1-Hour Ozone Standard. (2013, September 19). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁶¹ EPA. Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

C.36.6 Potential Emission Reduction Opportunities

There are District BACT standards more stringent than what is currently required in Rule 4623; however, additional add-on controls are beyond RACT and are not technologically feasible and cost effective for all facilities subject to Rule 4623. This determination is further supported by the District's 2013 Plan for the Revoked 1-hour Ozone Standard,⁶² as approved by EPA.⁶³

C.36.7 Evaluation Findings

Rule 4623 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

⁶² SJVAPCD. *2013 Plan for the Revoked 1-Hour Ozone Standard*. (2013, September 19). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁶³ EPA. *Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California*; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

C.37 RULE 4624 TRANSFER OF ORGANIC LIQUID

C.37.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.03	0.04	0.05	0.05	0.05	0.06	0.06	0.06	0.06
VOC	1.11	1.15	1.20	1.25	1.31	1.39	1.44	1.45	1.45

C.37.2 District Rule 4624 Description

This rule applies to organic liquid transfer facilities. The purpose of this rule is to limit VOC emissions from the transfer of organic liquids.

C.37.3 How does District Rule 4624 compare with federal rules and regulations?

C.37.3.1 EPA – Control Technique Guidelines (CTG)

C.37.3.1.1 CTG - EPA-450/2-77-035 (Control of Volatile Organic Emissions from Bulk Plants)

The requirements of Rule 4624 are as stringent as or more stringent than the requirements in the CTG.

C.37.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.37.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.37.3.3.1 NSPS - 40 CFR 60 Subpart Kb (a)(3)(i) (Volatile Organic Liquid Storage Vessel)

The requirements of Rule 4624 are as stringent as or more stringent than the requirements in the NSPS.

C.37.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.37.3.4.1 NESHAP/MACT – 40 CFR 63 Subpart EEE (Organic Liquids Distribution (Non-Gasoline))

The requirements of Rule 4624 are as stringent as or more stringent than the requirements in the NESHAP/MACT.

C.37.4 How does District Rule 4624 compare with California State regulations?

There are no state regulations applicable to this source category.

C.37.5 How does District Rule 4624 compare to regulations from other air districts?**C.37.5.1 Bay Area AQMD****C.37.5.1.1 Regulation 8 Rule 6 (Terminals and Bulk Plants)**

The requirements in Rule 4624 are as stringent as or more stringent than those in Rule 8-6.

C.37.5.1.2 Regulation 8 Rule 39 (Gasoline Bulk Plants and Gasoline Delivery Vehicles)

The requirements in Rule 4624 are as stringent as or more stringent than those in Rule 8-39.

C.37.5.1.3 Regulation 8 Rule 33 (Gasoline Bulk Terminals and Gasoline Delivery Vehicles)

Rule 8-33 was amended in April 2009 to require an emissions limit of 0.04lb VOC/1,000 gallons, which is lower than the RACT limit in current District Rule 4624 (0.08lb VOC/1,000 gallons liquid loaded). The BAAQMD Regulation 8 Rule 33 limit is beyond RACT. This determination is further supported by the District's 2013 Plan for the Revoked 1-hour Ozone Standard,⁶⁴ as approved by EPA in 2016.⁶⁵

C.37.5.2 Sacramento Metro AQMD**C.37.5.2.1 SMAQMD Rule 447(Organic Liquid Loading)**

The requirements in Rule 4624 are as stringent as or more stringent than those in Rule 447.

C.37.5.3 South Coast AQMD**C.37.5.3.1 SCAQMD Rule 462 (Organic Liquid Loading)**

The requirements in Rule 4624 are as stringent as or more stringent than those in Rule 462.

⁶⁴ SJVAPCD. 2013 Plan for the Revoked 1-Hour Ozone Standard. (2013, September 19). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁶⁵ EPA. Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

C.37.5.3.2 SCAQMD Rule 1142 (Marine Tank Vessel Operations)

The requirements in Rule 4624 are as stringent as or more stringent than those in Rule 1142.

C.37.5.4 Ventura County APCD**C.37.5.4.1 VCAPCD Rule 70 (Storage and Transfer of Gasoline)**

The requirements in Rule 4624 are as stringent as or more stringent than those in Rule 70.

C.37.5.4.2 VCAPCD Rule 71.3 (Transfer of Reactive Organic Compound Liquids)

The requirements in Rule 4624 are as stringent as or more stringent than those in Rule 71.3.

C.37.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.37.7 Evaluation Findings

Rule 4624 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.38 RULE 4625 WASTEWATER SEPARATORS

C.38.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07

C.38.2 District Rule 4625 Description

This rule applies to wastewater separators including air flotation units, as defined in this rule. The requirements of this rule only apply to the separation of crude oil and water after custody transfer. The purpose of this rule is to limit VOC emissions from wastewater separators by requiring vapor loss control devices, recordkeeping, inspection, and test methods.

C.38.3 How does District Rule 4625 compare with federal rules and regulations?

C.38.3.1 EPA – Control Technique Guidelines (CTG)

C.38.3.1.1 CTG - EPA-450/2-77-025 (Control of Refinery Vacuum Producing Systems, Water Separators and Process Unit Turnarounds)

The requirements of Rule 4625 are as stringent as or more stringent than the requirements in the CTG.

C.38.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.38.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.38.3.3.1 NSPS – 40 CFR 60 Subpart QQQ (Standards of Performance for VOC Emissions from Petroleum Refinery Wastewater Systems)

The requirements of Rule 4625 are as stringent as or more stringent than the requirements in the NSPS.

C.38.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.38.3.4.1 NESHAP/MACT – 40 CFR 63 Subpart VV (National Emission Standards for Oil-Water Separators and Organic-Water Separators)

The requirements of Rule 4625 are as stringent as or more stringent than the requirements in the NESHAP/MACT.

C.38.4 How does District Rule 4625 compare with California State regulations?

There are no state regulations applicable to this source category.

C.38.5 How does District Rule 4625 compare to regulations from other air districts?**C.38.5.1 Bay Area AQMD****C.38.5.1.1 Regulation 8 Rule 8 (Wastewater (Oil-Water) Separators)**

The requirements in Rule 4625 are as stringent as or more stringent than those in Rule 8-8.

C.38.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.38.5.3 South Coast AQMD**C.38.5.3.1 SCAQMD Rule 1176 (VOC Emissions from Wastewater Systems)**

The requirements in Rule 4625 are as stringent as or more stringent than those in Rule 1176.

C.38.5.4 Ventura County APCD**C.38.5.4.1 Rule 74.8 (Refinery Vacuum Producing Systems, Wastewater Separators and Process Turnarounds)**

The requirements in Rule 4625 are as stringent as or more stringent than those in Rule 74.8.

C.38.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.38.7 Evaluation Findings

Rule 4625 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.39 RULE 4641 CUTBACK, SLOW CURE, AND EMULSIFIED ASPHALT, PAVING, AND MAINTENANCE OPERATIONS

C.39.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.76	0.76	0.77	0.77	0.77	0.79	0.79	0.80	0.80

C.39.2 District Rule 4641 Description

This rule applies to the manufacture and use of cutback asphalt, slow cure asphalt, and emulsified asphalt for paving and maintenance operations. The purpose of this rule is to limit VOC emissions by restricting the application and manufacturing of certain types of asphalt for paving and maintenance operations.

C.39.3 How does District Rule 4641 compare with federal rules and regulations?

C.39.3.1 EPA – Control Technique Guidelines (CTG)

C.39.3.1.1 CTG - EPA-450/2-77-037 (Control of Volatile Organic Compounds from Use of Cutback Asphalt)

The requirements of Rule 4641 are as stringent as or more stringent than the requirements in the CTG.

C.39.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.39.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.39.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.39.4 How does District Rule 4641 compare with California State regulations?

There are no state regulations applicable to this source category.

C.39.5 How does District Rule 4641 compare to regulations from other air districts?**C.39.5.1 Bay Area AQMD****C.39.5.1.1 Regulation 8 Rule 15 (Emulsified and Liquid Asphalts)**

The requirements in Rule 4641 are as stringent as or more stringent than those in Rule 8-15.

C.39.5.2 Sacramento Metro AQMD**C.39.5.2.1 SMAQMD Rule 453 (Cutback and Emulsified Asphalt Paving Materials)**

The requirements in Rule 4641 are as stringent as or more stringent than those in Rule 453.

C.39.5.3 South Coast AQMD**C.39.5.3.1 SCAQMD Rule 1108 (Cutback Asphalt)**

The requirements in Rule 4641 are as stringent as or more stringent than those in Rule 1108.

C.39.5.3.2 SCAQMD Rule 1108.1 (Emulsified Asphalt)

The requirements in Rule 4641 are as stringent as or more stringent than those in Rule 1108.1.

C.39.5.4 Ventura County APCD**C.39.5.4.1 VCAPCD Rule 74.4 (Cutback Asphalt)**

The requirements in Rule 4641 are as stringent as or more stringent than those in Rule 74.4.

C.39.6 Potential Emission Reduction Opportunities

Although Rule 4641 currently only regulates VOC emissions, the District made a commitment in the *2015 PM_{2.5} Plan* to conduct a further study to evaluate Warm Mix Asphalt (WMA) for the purpose of reducing NO_x emissions associated with asphalt production. Using WMA instead of hot mix asphalt (HMA) results in lower temperatures necessary for production, storage, and transport. The District collaborated with asphalt industry stakeholders and policy makers to conduct a further study in order to gain an understanding of the use of warm mix technologies in the Valley and to identify potential opportunities and barriers for adoption of this technology.

This study found that WMA has the potential to reduce emissions by using less fuel and the potential to provide safer conditions by producing less odor and fumes. However, in the Valley, many barriers still remain. Poor paving performance in the Valley's high summer heat, lack of confidence in WMA technology, an insufficient number of pilot projects to support feasibility in the Valley, lack of Caltrans WMA specifications to support proper WMA usage, and not enough demand to provide the needed economies of scale to achieve the identified cost benefits have all hindered widespread adoption of WMA throughout the Valley.

The results of this further study effort are available here:
http://www.valleyair.org/Air_Quality_Plans/PM_Plans.htm

C.39.7 Evaluation Findings

Rule 4641 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for potential emission reduction opportunities.

C.40 RULE 4642 SOLID WASTE DISPOSAL SITES

C.40.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	1.37	1.42	1.48	1.55	1.63	1.70	1.76	1.78	1.81

C.40.2 District Rule 4642 Description

The provisions of this rule apply to any solid waste disposal sites with a gas collection system and/or control device in operation, or undergoing maintenance or repair. The purpose of this rule is to reduce VOC emissions from solid waste disposal sites.

C.40.3 How does District Rule 4642 compare with federal rules and regulations?

C.40.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.40.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.40.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.40.3.3.1 NSPS – 40 CFR 60 Subpart CC (Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills)

The requirements of Rule 4642 are as stringent as or more stringent than the requirements in the NSPS.

C.40.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.40.3.4.1 MACT – 40 CFR 63 Subpart AAAA (National Emission Standards for Hazardous Air Pollutants from Municipal Solid Waste Landfills)

EPA NESHAP requirements are not applicable to this source category. The requirements of Rule 4642 are as stringent as or more stringent than the requirements in the MACT.

C.40.4 How does District Rule 4642 compare with California State regulations?

There are no state regulations applicable to this source category.

C.40.5 How does District Rule 4642 compare to regulations from other air districts?**C.40.5.1 Bay Area AQMD****C.40.5.1.1 Regulation 8 Rule 34 (Solid Waste Disposal Sites)**

The requirements in Rule 4642 are as stringent as or more stringent than those in Rule 8-34.

C.40.5.2 Sacramento Metro AQMD**C.40.5.2.1 SMAQMD Rule 485 (Municipal Landfill Gas)**

The requirements in Rule 4642 are as stringent as or more stringent than those in Rule 485.

C.40.5.3 South Coast AQMD**C.40.5.3.1 SCAQMD Rule 1150 (Excavation of Landfill Sites)**

The requirements in Rule 4642 are as stringent as or more stringent than those in Rule 1150.

C.40.5.3.2 SCAQMD Rule 1150.1 (Control of Gaseous Emissions from Municipal Solid Waste Landfills)

The requirements in Rule 4642 are as stringent as or more stringent than those in Rule 1150.1.

C.40.5.4 Ventura County APCD**C.40.5.4.1 Rule 74.17.1 (Municipal Solid Waste Landfills)**

The requirements in Rule 4642 are as stringent as or more stringent than those in Rule 74.17.1.

C.40.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.40.7 Evaluation Findings

Rule 4642 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.41 RULE 4651 SOIL DECONTAMINATION OPERATIONS

C.41.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.11	0.11	0.12	0.12	0.13	0.13	0.14	0.14	0.14

C.41.2 District Rule 4651 Description

This rule applies to operations involved in the excavation, transportation, handling, decontamination, and disposal of contaminated soil. The purpose of this rule is to limit VOC emissions from soil that has been contaminated with a VOC-containing liquid.

C.41.3 How does District Rule 4651 compare with federal rules and regulations?

C.41.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.41.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.41.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.41.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.41.4 How does District Rule 4651 compare with California State regulations?

There are no state regulations applicable to this source category.

C.41.5 How does District Rule 4651 compare to regulations from other air districts?

C.41.5.1 Bay Area AQMD**C.41.5.1.1 Regulation 8 Rule 40 (Aeration of Contaminated Soil and Removal of Underground Storage Tanks)**

The requirements in Rule 4651 are as stringent as or more stringent than those in Rule 8-40.

C.41.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.41.5.3 South Coast AQMD**C.41.5.3.1 SCAQMD Rule 1166 (Volatile Organic Compound Emissions from Decontamination of Soil)**

The requirements in Rule 4651 are as stringent as or more stringent than those in Rule 1166.

C.41.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.41.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.41.7 Evaluation Findings

Rule 4651 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.42 RULE 4652 COATINGS AND INK MANUFACTURING

C.42.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02

C.42.2 District Rule 4652 Description

The provisions of this rule apply to all coatings and ink manufacturing operations. The purpose of this rule is to limit VOC emissions from these operations.

C.42.3 How does District Rule 4652 compare with federal rules and regulations?

C.42.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.42.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.42.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.42.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.42.4 How does District Rule 4652 compare with California State regulations?

There are no state regulations applicable to this source category.

C.42.5 How does District Rule 4652 compare to regulations from other air districts?

C.42.5.1 Bay Area AQMD

C.42.5.1.1 Regulation 8 Rule 35 (Coating, Ink and Adhesive Manufacturing)

Although there are some VOC limits in Rule 8-35 that differ in stringency in comparison to District Rule 4652, Rule 4652 is overall at least as stringent as Rule 46. This

determination is further supported by the District's 2013 Plan for the Revoked 1-hour Ozone Standard,⁶⁶ as approved by EPA in 2016.⁶⁷

C.42.5.2 Sacramento Metro AQMD

C.42.5.2.1 Rule 466 (Solvent Cleaning)

Although there are some VOC limits in Rule 466 that differ in stringency in comparison to Rule 4652, Rule 4652 is overall more stringent than Rule 466. This determination is further supported by the District's 2013 Plan for the Revoked 1-hour Ozone Standard,⁶⁸ as approved by EPA in 2016.⁶⁹

C.42.5.3 South Coast AQMD

C.42.5.3.1 Rule 1141.1 (Coatings and Ink Manufacturing)

The requirements in Rule 4652 are as stringent as or more stringent than those in Rule 1141.1.

C.42.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.42.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.42.7 Evaluation Findings

According to the federal CAA §182(b)(2) and (f) this source category is not subject to federal RACT requirements because this source category has no sources subject to EPA CTGs and these sources are not "major sources" of VOCs and NOx, as confirmed by EPA in the Technical Support Document (TSD) for the partial approval of the Districts 2009 RACT SIP.⁷⁰ However, pursuant to the District's No Stone Left Unturned philosophy, Rule 4652 was evaluated as a part of this plan development effort.

Rule 4652 currently has in place the most stringent measures feasible to implement in the Valley and therefore would meet or exceed federal RACT requirements for this

⁶⁶ SJVAPCD. *2013 Plan for the Revoked 1-Hour Ozone Standard*. (2013, September 19). Retrieved from:

http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁶⁷ EPA. *Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California*; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

⁶⁸ SJVAPCD. *2013 Plan for the Revoked 1-Hour Ozone Standard*. (2013, September 19). Retrieved from:

http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁶⁹ EPA. *Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California*; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

⁷⁰ U.S. EPA. Region IX Air Division. Technical Support Document for EPA's Notice of Proposed Rulemaking for the California State Implementation Plan. Prepared by Stanley Tong. (2011, August 29).

<https://www.regulations.gov/#!documentDetail;D=EPA-R09-OAR-2011-0723-0006>

source category were they applicable. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.43 RULE 4653 ADHESIVES AND SEALANTS

C.43.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.57	0.54	0.52	0.51	0.49	0.49	0.48	0.47	0.47

C.43.2 District Rule 4653 Description

This rule is applicable to any person who supplies, sells, offers for sale, or applies any adhesive product, sealant product, or associated solvent used within the District. The purpose of this rule is to reduce emissions of VOCs from these operations.

EPA finalized a partial approval/partial disapproval of the 2009 RACT SIP on January 10, 2012 and deemed this rule as being at least as stringent as established RACT requirements: 77 FR 1417, <http://www.gpo.gov/fdsys/pkg/FR-2012-01-10/pdf/2012-139.pdf>. EPA finalized approval of the 2010 amendments to Rule 4653 on February 13, 2012 and deemed this rule as being at least as stringent as established RACT requirements: 77 FR 7536, <http://www.gpo.gov/fdsys/pkg/FR-2012-02-13/pdf/2012-3172.pdf>

C.43.3 How does District Rule 4653 compare with federal rules and regulations?

C.43.3.1 EPA – Control Technique Guidelines (CTG)

C.43.3.1.1 CTG – EPA-453/R-08-005 (Control Techniques Guidelines for Miscellaneous Industrial Adhesives)

The requirements in Rule 4653 are as stringent as or more stringent than those in the CTG.

C.43.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.43.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.43.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.43.4 How does District Rule 4653 compare with California State regulations?

There are no state regulations applicable to this source category.

C.43.4.1.1 ARB's RACT/Best Available Retrofit Control Technology (BARCT) - Determination of Reasonably Available Control Technology and Best Available Retrofit Control Technology for Adhesives and Sealants

The requirements of Rule 4653 are as stringent as or more stringent than the requirements in the BARCT.

C.43.5 How does District Rule 4653 compare to regulations from other air districts?

C.43.5.1 Bay Area AQMD

C.43.5.1.1 Regulation 8 Rule 51 (Adhesive and Sealant Products)

The requirements in Rule 4653 are as stringent as or more stringent than those in Rule 8-51.

C.43.5.2 Sacramento Metro AQMD

C.43.5.2.1 SMAQMD Rule 460 (Adhesives and Sealants)

The requirements in Rule 4653 are as stringent as or more stringent than those in Rule 460.

C.43.5.3 South Coast AQMD

C.43.5.3.1 SCAQMD Rule 1168 (Adhesive and Sealant Applications)

The requirements in Rule 4653 are as stringent as or more stringent than those in Rule 1168.

C.43.5.4 Ventura County APCD

C.43.5.4.1 Rule 74.20 (Adhesives and Sealants)

The requirements in Rule 4653 are as stringent as or more stringent than those in Rule 74.20.

C.43.6 Potential Emission Reduction Opportunities

No additional emissions reductions opportunities have been identified at this time. This determination is further supported by the District's *2013 Plan for the Revoked 1-hour Ozone Standard*,⁷¹ as approved by EPA.⁷²

C.43.7 Evaluation Findings

Rule 4653 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

⁷¹ SJVAPCD. *2013 Plan for the Revoked 1-Hour Ozone Standard*. (2013, September 19). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁷² EPA. *Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California*; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

C.44 RULE 4661 ORGANIC SOLVENTS

C.44.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
VOC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Rule 4661 establishes limits for the use of organic solvents, however their emissions are represented in the rules that regulate their use: Rule 4662 (Organic Solvent Degreasing Operations), and Rule 4663 (Organic Solvent Cleaning, Storage, and Disposal).

C.44.2 District Rule 4661 Description

This rule applies to any source operation that uses organic solvents, with the exception of operations exempted under Section 4.0 of the rule (generally, the manufacture or transport of organic solvents or any source operation that is subject to or exempted by another District rule). The purpose of this rule is to limit VOC emissions from the use of organic solvents. EPA finalized approval of the 2007 amendments to Rule 4661 on May 5, 2010 and deemed this rule as being at least as stringent as established RACT requirements.⁷³

C.44.3 How does District Rule 4661 compare with federal rules and regulations?

C.44.3.1 EPA – Control Technique Guidelines (CTG)

C.44.3.1.1 CTG - EPA-453/R-06-001 2006/09 (Control Techniques Guidelines for Industrial Cleaning Solvents)

The requirements of Rule 4661 are as stringent as or more stringent than the requirements in the CTG.

C.44.3.2 EPA – Alternative Control Technology (ACT)

C.44.3.2.1 ACT - EPA-453/R-94-015 1994/02 (Industrial Cleaning Solvents)

The requirements of Rule 4661 are as stringent as or more stringent than the requirements in the ACT.

C.44.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

⁷³ 75 FR 24406, <http://www.gpo.gov/fdsys/pkg/FR-2010-05-05/pdf/2010-10402.pdf>

C.44.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.44.3.4.1 NESHAP/MACT – 40 CFR 63 Subpart T (National Emission Standards for HAPs: Halogenated Solvent Cleaning)

The requirements of Rule 4661 are as stringent as or more stringent than the requirements in the NESHAP.

C.44.4 How does District Rule 4661 compare with California State regulations?

There are no state regulations applicable to this source category.

C.44.5 How does District Rule 4661 compare to regulations from other air districts?

C.44.5.1 Bay Area AQMD

C.44.5.1.1 Regulation 8 Rule 11 (Metal Container, Closure and Coil Coating)

No requirements in Rule 8-11 are more stringent than those in Rule 4661.

C.44.5.2 Sacramento Metro AQMD

C.44.5.2.1 SMAQMD Rule 441 (Organic Solvents)

The requirements in Rule 4661 are as stringent as or more stringent than those in Rule 441.

C.44.5.3 South Coast AQMD

C.44.5.3.1 SCAQMD Rule 1171 (Solvent Cleaning Operation)

The requirements in Rule 4661 are as stringent as or more stringent than those in Rule 1171.

C.44.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.44.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.44.7 Evaluation Findings

Rule 4661 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address

increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.45 RULE 4662 ORGANIC SOLVENTS DEGREASING OPERATIONS

C.45.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	1.05	1.05	1.06	1.06	1.06	1.07	1.08	1.08	1.08

C.45.2 District Rule 4662 Description

This rule applies to all organic solvent degreasing operations. The purpose of this rule is to limit VOC emissions and hazardous air pollutant emissions from these operations. EPA finalized approval of the 2007 amendments to Rule 4662 on July 30, 2009 and deemed this rule as being at least as stringent as established RACT requirements.⁷⁴

C.45.3 How does District Rule 4662 compare with federal rules and regulations?

C.45.3.1 EPA – Control Technique Guidelines (CTG)

C.45.3.1.1 CTG - EPA 450/2-77-022 1977/11 (Control of Volatile Organic Emissions from Solvent Metal Cleaning)

The requirements of Rule 4662 are as stringent as or more stringent than the requirements in the CTG.

C.45.3.1.2 CTG - EPA 453/R-06-001 Control Technique Guidelines for Industrial Cleaning Solvents

The requirements of Rule 4662 are as stringent as or more stringent than the requirements in the CTG.

C.45.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.45.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.45.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

⁷⁴ 74 FR 37948, <http://www.gpo.gov/fdsys/pkg/FR-2009-07-30/pdf/E9-18001.pdf>

C.45.4 How does District Rule 4662 compare with California State regulations?

There are no state regulations applicable to this source category.

C.45.5 How does District Rule 4662 compare to regulations from other air districts?**C.45.5.1 Bay Area AQMD****C.45.5.1.1 Regulation 8 Rule 16 (Solvent Cleaning Operations)**

BAAQMD does not have a rule that specifically covers organic solvent degreasing operations, but conveyORIZED solvent cleaner operation requirements are included in Regulation 8, Rule 16 (Solvent Cleaning Operations). The requirements in Rule 4662 are as stringent as or more stringent than those in Rule 8-16.

C.45.5.2 Sacramento Metro AQMD**C.45.5.2.1 SMAQMD Rule 454 (Degreasing Operations)**

The requirements of Rule 4663 are as stringent as or more stringent than the requirements in rule 454.

C.45.5.3 South Coast AQMD**C.45.5.3.1 SCAQMD Rule 1122 (Solvent Degreasers)**

The requirements of Rule 4663 are as stringent as or more stringent than the requirements in rule 1122.

C.45.5.4 Ventura County APCD**C.45.5.4.1 Rule 74.6 (Surface Cleaning and Degreasing)**

The requirements of Rule 4663 are as stringent as or more stringent than the requirements in rule 74.6.

C.45.6 Potential Emission Reduction Opportunities

No additional emissions reductions opportunities have been identified at this time. This determination is further supported by the District's 2013 Plan for the Revoked 1-hour Ozone Standard,⁷⁵ as approved by EPA.⁷⁶

C.45.7 Evaluation Findings

⁷⁵ SJVAPCD. 2013 Plan for the Revoked 1-Hour Ozone Standard. (2013, September 19). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁷⁶ EPA. Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

Rule 4662 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.46 RULE 4663 ORGANIC SOLVENT CLEANING, STORAGE, AND DISPOSAL

C.46.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.62	0.66	0.71	0.74	0.8	0.82	0.86	0.87	0.87

C.46.2 District Rule 4663 Description

This rule applies to organic solvent cleaning performed outside a degreaser during the production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or in general work areas at stationary sources. This rule also applies to the storage and disposal of all solvents and waste solvent materials at stationary sources. The purpose of this rule is to limit VOC emissions from these processes. EPA finalized approval of the 2007 amendments to Rule 4663 on July 30, 2009 and deemed this rule as being at least as stringent as established RACT requirements.⁷⁷

C.46.3 How does District Rule 4663 compare with federal rules and regulations?

C.46.3.1 EPA – Control Technique Guidelines (CTG)

C.46.3.1.1 CTG - EPA-453/R-06-001 2006/09 (Control Techniques Guidelines for Industrial Cleaning Solvents)

The requirements of Rule 4663 are as stringent as or more stringent than the requirements in the CTG.

C.46.3.2 EPA – Alternative Control Technology (ACT)

C.46.3.2.1 ACT - EPA-453/R-94-015 1994/02 (Alternative Control Techniques Document--Industrial Cleaning Solvents)

The requirements of Rule 4663 are as stringent as or more stringent than the requirements in the ACT.

C.46.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.46.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

⁷⁷ FR 74 37948, <http://www.gpo.gov/fdsys/pkg/FR-2009-07-30/pdf/E9-18001.pdf>

EPA NESHAP and MACT requirements are not applicable to this source category.

C.46.4 How does District Rule 4663 compare with California State regulations?

There are no state regulations applicable to this source category.

C.46.5 How does District Rule 4663 compare to regulations from other air districts?

C.46.5.1 Bay Area AQMD

C.46.5.1.1 Regulation 8 Rule 16 (Solvent Cleaning Operations)

The requirements in Rule 4663 are as stringent as or more stringent than those in Rule 8-16.

C.46.5.2 Sacramento Metro AQMD

C.46.5.2.1 SMAQMD Rule 441 (Organic Solvents)

The requirements in Rule 4663 are as stringent as or more stringent than those in Rule 441.

C.46.5.3 South Coast AQMD

C.46.5.3.1 SCAQMD Rule 1171(Solvent Cleaning Operation)

The requirements in Rule 4663 are as stringent as or more stringent than those in Rule 1171.

C.46.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.46.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.46.7 Evaluation Findings

Rule 4663 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.47 RULE 4672 PETROLEUM SOLVENT DRY CLEANING OPERATIONS

C.47.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07
VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

C.47.2 District Rule 4672 Description

This rule applies to petroleum solvent washers, dryers, solvent filters, settling tanks, vacuum stills, and other containers and conveyors of petroleum solvents used in petroleum solvent dry cleaning facilities. The purpose of this rule is to limit VOC emissions from petroleum solvent dry cleaning operations.

EPA finalized approval of the 1992 amendments to Rule 4672 on March 9, 2010 and deemed this rule as being at least as stringent as established RACT requirements: 75 FR 10690, <http://www.gpo.gov/fdsys/pkg/FR-2010-03-09/pdf/2010-4967.pdf> EPA finalized a partial approval/partial disapproval of the 2009 RACT SIP on January 10, 2012 and deemed this rule as still being at least as stringent as established RACT requirements: 77 FR 1417, <http://www.gpo.gov/fdsys/pkg/FR-2012-01-10/pdf/2012-139.pdf>

C.47.3 How does District Rule 4672 compare with federal rules and regulations?

C.47.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.47.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.47.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.47.3.3.1 NSPS – 40 CFR 60 Subpart JJJ (Standards of Performance for Petroleum Dry Cleaners)

The requirements of Rule 4672 are as stringent as or more stringent than the requirements in the NSPS.

C.47.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.47.4 How does District Rule 4672 compare with California State regulations?

There are no state regulations applicable to this source category.

C.47.5 How does District Rule 4672 compare to regulations from other air districts?**C.47.5.1 Bay Area AQMD****C.47.5.1.1 Regulation 8 Rule 17 (Petroleum Dry Cleaning Operations)**

The requirements in Rule 4672 are as stringent as or more stringent than those in Rule 8-17.

C.47.5.2 Sacramento Metro AQMD**C.47.5.2.1 Rule 444 (Petroleum Solvent Dry Cleaning)**

The requirements in Rule 4672 are as stringent as or more stringent than those in Rule 444.

C.47.5.3 South Coast AQMD**C.47.5.3.1 Rule 1102 (Dry Cleaners Using Solvent Other Than Perchloroethylene)**

The requirements in Rule 4672 are as stringent as or more stringent than those in Rule 1102.

C.47.5.4 Ventura County APCD**C.47.5.4.1 Rule 74.5.1 (Petroleum Solvent Dry Cleaning)**

The requirements in Rule 4672 are as stringent as or more stringent than those in Rule 74.5.1.

C.47.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.47.7 Evaluation Findings

Rule 4672 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.48 RULE 4681 RUBBER TIRE MANUFACTURING

C.48.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

There are no sources in the Valley. There are no emissions from this source category.

C.48.2 District Rule 4681 Description

This rule applies to rubber tire and recapping tread stock manufacturing facilities. The purpose of this rule is to limit emissions of VOC from these facilities.

EPA finalized approval of the 1993 amendments to Rule 4681 on August 17, 1998 and deemed this rule as being at least as stringent as then established RACT requirements.⁷⁸

The District adopted a Negative Declaration on December 16, 2010 to satisfy Clean Air Act CTG RACT requirements for this source category. There are currently no rubber tire manufacturers operating in the Valley. Any rubber tire manufacturers beginning operation in the Valley in the future would be required to go beyond CTG RACT requirements and meet District BACT requirements, per District Rules 2201 (New and Modified Stationary Source Review Rule).

C.48.3 How does District Rule 4681 compare with federal rules and regulations?

C.48.3.1 EPA – Control Technique Guidelines (CTG)

C.48.3.1.1 CTG – EPA-450-2-78-030 (Control of Volatile Organic Emissions from Manufacture of Pneumatic Rubber Tires)

The requirements of Rule 4681 are as stringent as or more stringent than the requirements in the CTG.

C.48.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

⁷⁸ 63 FR 43881, <http://www.gpo.gov/fdsys/pkg/FR-1998-08-17/pdf/98-21900.pdf>

C.48.3.3 Standards of Performance for New Stationary Sources (NSPS)**C.48.3.3.1 NSPS – 40 CFR 60 Subpart BBB (Standards of Performance for the Rubber Tire Manufacturing Industry)**

The requirements of Rule 4681 are as stringent as or more stringent than the requirements in the NSPS.

C.48.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.48.4 How does District Rule 4681 compare with California State regulations?

There are no state regulations applicable to this source category.

C.48.5 How does District Rule 4681 compare to regulations from other air districts?**C.48.5.1 Bay Area AQMD**

There are no analogous rules for this source category.

C.48.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.48.5.3 South Coast AQMD

There are no analogous rules for this source category.

C.48.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.48.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.48.7 Evaluation Findings

There are no rubber tire manufacturers in operation in the Valley, nor are any expected to be operated in the Valley in the future. However, if any rubber tire manufacturers were to begin operating in the Valley, it would be required to meet District BACT requirements, which by definition are beyond RACT. As such, Rule 4681 meets or exceeds federal RACT requirements for this source category.

C.49 RULE 4682 POLYSTYRENE, POLYETHYLENE, AND POLYPROPYLENE PRODUCTS MANUFACTURING

C.49.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.30	0.31	0.32	0.34	0.36	0.39	0.41	0.42	0.42

C.49.2 District Rule 4682 Description

The provisions of this rule apply to the manufacturing, processing, and storage of products composed of polystyrene, polyethylene, or polypropylene. The purpose of this rule is to limit emissions of VOCs, trichlorofluoromethane, and dichlorofluoromethane from this source category. EPA finalized approval of the 2011 amendments to Rule 4682 on September 20, 2012 and deemed this rule as being at least as stringent as established RACT requirements.⁷⁹

C.49.3 How does District Rule 4682 compare with federal rules and regulations?

C.49.3.1 EPA – Control Technique Guidelines (CTG)

There are two federal CTGs guidelines that regulate the manufacturing of raw polystyrene, polyethylene, and polypropylene. The facilities subject to Rule 4682 use these raw materials in their manufacturing processes, but do not manufacture such material on site; as such, these regulations do not apply to this source category. EPA CTG requirements are not applicable to this source category.

C.49.3.2 EPA – Alternative Control Technology (ACT)

C.49.3.2.1 ACT – EPA-450/3-90-020 (Control of VOC Emissions from Polystyrene Foam Manufacturing)

The requirements of Rule 4682 are as stringent as or more stringent than the requirements in the ACT.

C.49.3.3 Standards of Performance for New Stationary Sources (NSPS)

⁷⁹ 77 FR 58312, <http://www.gpo.gov/fdsys/pkg/FR-2012-09-20/pdf/2012-21218.pdf>

C.49.3.3.1 NSPS – 40 CFR Part 60 Subpart DDD (Standards of Performance for Volatile Organic Compound (VOC) Emissions from the Polymer Manufacturing Industry)

There is a NSPS guideline that regulates the manufacturing of raw polystyrene, polyethylene, and polypropylene. The facilities subject to Rule 4682 use these raw materials in their manufacturing processes, but do not manufacture such material on site; as such, these regulations do not apply to this source category.

C.49.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.49.4 How does District Rule 4682 compare with California State regulations?

There are no state regulations applicable to this source category.

C.49.5 How does District Rule 4682 compare to regulations from other air districts?

C.49.5.1 Bay Area AQMD

C.49.5.1.1 Regulation 8 Rule 52 (Polystyrene, Polypropylene and Polyethylene Foam Product Manufacturing Operations)

The requirements in Rule 4682 are as stringent as or more stringent than those in Rule 8.

C.49.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.49.5.3 South Coast AQMD

C.49.5.3.1 SCAQMD Rule 1175 (Control of Emissions from the Manufacture of Polymeric Cellular (Foam) Products)

The requirements in Rule 4682 are as stringent as or more stringent than those in Rule 1175.

C.49.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.49.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.49.7 Evaluation Findings

Rule 4682 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.50 RULE 4684 POLYESTER RESIN OPERATIONS

C.50.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.23	0.24	0.24	0.26	0.28	0.30	0.31	0.32	0.33

C.50.2 District Rule 4684 Description

The provisions of this rule apply to commercial and industrial polyester resin operations, fiberglass boat manufacturing operations, organic solvent cleaning, and the storage and disposal of all solvents and waste solvent materials associated with such operations. The purpose of this rule is to reduce VOC emissions from these operations.

EPA finalized approval of the 2011 amendments to Rule 4684 on February 6, 2012 and deemed this rule as being at least as stringent as established RACT requirements.⁸⁰ Rule 4684 was recently amended in 2011 to add new specialty coating categories, lower VOC limits, and raise control system effectiveness limits to match existing limits in other air districts. There were no additional feasible emission reduction opportunities that were identified at that time.

C.50.3 How does District Rule 4684 compare with federal rules and regulations?

C.50.3.1 EPA – Control Technique Guidelines (CTG)

C.50.3.1.1 CTG – EPA-450/3-83-006 (Control of Volatile Organic Compound Emissions from Manufacture of High-Density Polyethylene, Polypropylene, and Polystyrene Resins)

The requirements of Rule 4684 are as stringent as or more stringent than the requirements in the CTG.

C.50.3.1.2 CTG – EPA-453/R-08-004 (Control Technique for Fiberglass Boat Manufacturing Materials)

The requirements of Rule 4684 are as stringent as or more stringent than the requirements in the CTG.

C.50.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

⁸⁰ 77 FR 5709, <http://www.gpo.gov/fdsys/pkg/FR-2012-02-06/pdf/2012-2599.pdf>

C.50.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.50.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)**C.50.3.4.1 NESHAP/MACT – 40 CFR Part 61 Subpart VVVV (National Emission Standards for Hazardous Air Pollutants for Boat Manufacturing)**

The requirements of Rule 4684 are as stringent as or more stringent than the requirements in the NESHAP/MACT.

C.50.4 How does District Rule 4684 compare with California State regulations?

There are no state regulations applicable to this source category.

C.50.5 How does District Rule 4684 compare to regulations from other air districts?**C.50.5.1 Bay Area AQMD****C.50.5.1.1 Regulation 8 Rule 50 (Polyester Resin Operations)**

The requirements in Rule 4684 are as stringent as or more stringent than those in Rule 8-50.

C.50.5.2 Sacramento Metro AQMD**C.50.5.2.1 Rule 465 (Polyester Resin Operations)**

The requirements in Rule 4684 are as stringent as or more stringent than those in Rule 465.

C.50.5.3 South Coast AQMD**C.50.5.3.1 Rule 1162 (Polyester Resin Operations)**

The requirements in Rule 4684 are as stringent as or more stringent than those in Rule 1162.

C.50.5.4 Ventura County APCD**C.50.5.4.1 Rule 74.14 (Polyester Resin Material Operations)**

The requirements in Rule 4684 are as stringent as or more stringent than those in Rule 74.14.

C.50.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.50.7 Evaluation Findings

Rule 4684 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.51 RULE 4691 VEGETABLE OIL PROCESSING OPERATIONS

C.51.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	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	0.00

C.51.2 District Rule 4691 Description

This rule applies to facilities that extract oil from vegetable sources such as cottonseeds and corn. The purpose of this rule is to limit VOC emissions from vegetable oil processing operations. EPA finalized approval of the original 1991 District Rule 461.2 (Vegetable Oil Processing Operations), which subsequently became District Rule 4691, on January 18, 1994.⁸¹

C.51.3 How does District Rule 4691 compare with federal rules and regulations?

C.51.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.51.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.51.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.51.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.51.4 EPA NESHAP/MACT requirements are not applicable to this source category. How does District Rule 4691 compare with California State regulations?

There are no state regulations applicable to this source category.

C.51.5 How does District Rule 4691 compare to regulations from other air districts?

⁸¹ 59 FR 2535, <http://www.gpo.gov/fdsys/pkg/FR-1994-01-18/html/94-1059.htm>

C.51.5.1 Bay Area AQMD**C.51.5.1.1 Regulation 8 Rule 41 (Vegetable Oil Manufacturing Operations)**

The requirements in Rule 4691 are as stringent as or more stringent than those in Rule 8-41.

C.51.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.51.5.3 South Coast AQMD

There are no analogous rules for this source category.

C.51.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.51.6 Potential Emission Reduction Opportunities

No additional emission reduction opportunities have been identified at this time.

C.51.7 Evaluation Findings

Rule 4691 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.52 RULE 4692 COMMERCIAL CHARBROILERS

C.52.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.39	0.41	0.43	0.45	0.47	0.49	0.51	0.51	0.52

C.52.2 District Rule 4692 Description

The Rule 4692 source category includes charbroiling equipment located in restaurants, including hospitals, educational institutions, military, and government facilities. The purpose of this rule is to limit VOC and PM emissions from commercial charbroiling.

The original rule, adopted in March 2002, reduced PM_{2.5} emissions from chain-driven charbroilers by 84%. The September 2009 rule amendment expanded rule applicability to more chain-driven charbroilers, reducing 25% of the remaining PM_{2.5} chain-driven charbroiler emissions. EPA finalized approval for Rule 4692 on November 3, 2011.

C.52.3 How does District Rule 4692 compare with federal rules and regulations?

C.52.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.52.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.52.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.52.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.52.4 How does District Rule 4692 compare with California State regulations?

There are no state regulations applicable to this source category.

C.52.5 How does District Rule 4692 compare to regulations from other air districts?

C.52.5.1 Bay Area AQMD

C.52.5.1.1 Regulation 6 Rule 2 (Commercial Cooking Equipment)

BAAQMD Regulation 6 Rule 2 regulates both chain-driven and under-fired units. Newly installed under-fired units with more than 10 square feet of cooking area are required to limit emissions to 1 lb of PM10 per 1,000 lbs of cooked beef. Effective January 2013, the same emissions requirements also apply to pre-existing units. However, as the BAAQMD rule is implemented, a significant portion of under-fired charbroilers are below the applicability thresholds for grill size or amount of food cooked, and are thus exempt from rule requirements. In addition, BAAQMD has been unable to enforce this rule because no control technologies have been certified.

The applicability thresholds for grill size in District Rule 4692 are lower than those in BAAQMD Regulation 6 Rule 2. However, because BAAQMD Regulation 6 Rule 2 is not currently being enforced for under-fired charbroilers, District Rule 4692 is effectively more stringent.

C.52.5.2 Sacramento Metro AQMD

Sacramento Metro AQMD has no analogous rules for this source category.

C.52.5.3 South Coast AQMD

South Coast AQMD has no analogous rules for this source category.

C.52.5.4 Ventura County APCD

C.52.5.4.1 Rule 74.25 (Restaurant Cooking Operations)

The District evaluated the requirements contained within VCAPCD's Rule 74.25 and found no requirements more stringent than those already in Rule 4692.

C.52.6 Potential Emission Reduction Opportunities

Under-fired charbroiler technologies are still un-tested in real-life applications and need further evaluation and demonstration at Valley restaurants before these technologies can be considered as requirements to Rule 4692. Technological feasibility issues and logistical issues such as the need to modify hoods and exhaust systems and reinforce roof supports in addition to the purchase, installation, maintenance, and labor costs must all be evaluated.

During the summer of 2015 the Governing Board approved \$750,000 to fund the Restaurant Charbroiler Technology Partnership (RCTP) program which provides funding for restaurants to install particulate control systems for under-fired charbroilers as demonstration projects to assess their feasibility and effectiveness. This information will assist in evaluating potential amendments to Rule 4692. The first demonstration

unit funded under the RCTP program started operation in September 2015. Several additional projects are expected to be funded in the near future.

At this time, no additional potential emission reduction opportunities are available for this source category.

C.52.7 Evaluation Findings

According to the federal CAA §182(b)(2) and (f), this source category is not subject to federal RACT requirements, because this source category has no sources subject to EPA CTGs and are not “major sources” of VOCs and NO_x, as confirmed by EPA in the Technical Support Document (TSD) for the partial approval of the Districts 2009 RACT SIP.⁸² However, pursuant to the District’s No Stone Left Unturned philosophy, Rule 4692 was evaluated as a part of this plan development effort.

Rule 4692 currently has the most stringent control requirements. The District has no recommendations for future actions from this source category as a part of this attainment plan. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

⁸² U.S. EPA. Region IX Air Division. Technical Support Document for EPA’s Notice of Proposed Rulemaking for the California State Implementation Plan. Prepared by Stanley Tong. (2011, August 29). <https://www.regulations.gov/#!documentDetail;D=EPA-R09-OAR-2011-0723-0006>

C.53 RULE 4693 BAKERY OVENS

C.53.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	0.31	0.32	0.34	0.36	0.37	0.39	0.40	0.41	0.41

C.53.2 District Rule 4693 Description

The requirements of this rule apply to bakery ovens operated at major source facilities, which emit VOCs during the baking of yeast-leavened products. The purpose of this rule is to limit VOC emissions from these sources. EPA finalized approval of the 2002 adoption of Rule 4693 on April 26, 2004 and deemed this rule as being at least as stringent as established RACT requirements.⁸³

C.53.3 How does District Rule 4693 compare with federal rules and regulations?

C.53.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.53.3.2 EPA – Alternative Control Technology (ACT)

C.53.3.2.1 ACT – EPA-453/R-92-017 (Alternative Control Technology Document for Bakery Oven Emissions)

The requirements of Rule 4691 are as stringent as or more stringent than the requirements in the ACT.

C.53.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.53.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.53.4 How does District Rule 4693 compare with California State regulations?

There are no state regulations applicable to this source category.

⁸³ 69 FR 22441, <http://www.gpo.gov/fdsys/pkg/FR-2004-04-26/pdf/04-9279.pdf>

C.53.5 How does District Rule 4693 compare to regulations from other air districts?**C.53.5.1 Bay Area AQMD****C.53.5.1.1 Regulation 8 Rule 42 (Large Commercial Bread Bakeries)**

The requirements in Rule 4693 are as stringent as or more stringent than those in Rule 8-42.

C.53.5.2 Sacramento Metro AQMD**C.53.5.2.1 SMAQMD Rule 458 (Large Commercial Bread Bakeries)**

The requirements in Rule 4693 are as stringent as or more stringent than those in Rule 458.

C.53.5.3 South Coast AQMD**C.53.5.3.1 SCAQMD Rule 1153 (Commercial Bakery Ovens)**

The requirements in Rule 4693 are as stringent as or more stringent than those in Rule 1153.

C.53.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.53.6 Potential Emission Reduction Opportunities

No additional emissions reductions opportunities have been identified at this time. This determination is further supported by the District's 2013 Plan for the Revoked 1-hour Ozone Standard,⁸⁴ as approved by EPA.⁸⁵

C.53.7 Evaluation Findings

Rule 4693 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

⁸⁴ SJVAPCD. 2013 Plan for the Revoked 1-Hour Ozone Standard. (2013, September 19). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁸⁵ EPA. Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

C.54 RULE 4694 WINE FERMENTATION AND STORAGE TANKS

C.54.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	3.56	3.72	3.98	4.18	4.35	4.50	4.58	4.61	4.64

C.54.2 District Rule 4694 Description

Rule 4694 was adopted on December 15, 2005 to reduce VOC emissions from the fermentation and bulk storage of wine, or achieve equivalent reductions from alternative emission sources. This rule is applicable to any winery fermenting wine and/or storing bulk containers with the exception of wineries with baseline fermentation emissions of less than 10 tpy or is limited by a District permit condition to a Potential To Emit of less than 10 tpy VOC emissions from fermentation, or storage tanks made of concrete and/or wood.

The rule requires facilities to reduce the VOC emissions from fermentation by 35% of their baseline emissions annually. Tanks over 5,000 gallons in volume must be equipped with pressure/vacuum relieve valves operating within 10% of the maximum allowable working pressure of the tank, and the temperature of stored wine must be maintained 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.

General Process Description

Wine making involves three major steps: grapes are harvested, crushed, and then fermented. Rule 4694 focuses on the third step of this process, wine fermentation which is typically a batch process. The majority of the volume of the State of California's wine production occurs in the Valley. The majority of wine production in the Valley occurs at large wineries, with annual wine production capacities of tens of millions of gallons. Wine fermentation is a significant industry in the Valley with total projected emissions of 4.64 tpd of VOC in 2031.

Ethanol is the primary VOC produced during wine fermentation. Many different types of established technologies can be used to control ethanol emissions. Five types of VOC controls are:

1. Oxidation (conversion of the VOC to CO₂);
2. Absorption ("scrubbers", which transfer the VOC in air emissions to a liquid waste stream);
3. Adsorption (often using activated carbon, which transfers the VOC in the air onto a solid substrate);

4. Condensation (conversion of the VOC gases into liquids); and
5. Biological control systems (e.g., bio-filters or bio-scrubbers)

C.54.3 How does District Rule 4691 compare with federal rules and regulations?

C.54.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.54.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.54.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.54.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.54.4 How does District Rule 4694 compare with California State regulations?

There are no state regulations applicable to this source category.

C.54.5 How does District Rule 4694 compare to regulations from other air districts?

C.54.5.1 Bay Area AQMD

There are no analogous rules for this source category.

C.54.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.54.5.3 South Coast AQMD

There are no analogous rules for this source category.

C.54.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.54.6 Potential Emission Reduction Opportunities

Through ongoing review of wine fermentation permitting applications, the District has closely tracked the development of new emission control technologies for capturing ethanol emissions from wine fermentation processes. Technologies of interest have included scrubbers, condensers, activated carbon and thermal oxidizers. In recent years, several wine manufacturing facilities have successfully implemented or are experimenting with new emission control systems that capture ethanol emissions from some of their wine fermentation operations. Two wineries currently utilize water scrubbers to capture ethanol emissions from wine fermentation tanks, and several other wineries have developed systems that utilize scrubbers and chilled vapor condensers. Preliminary cost effectiveness analyses results indicate the costs to be between \$18,337 and \$89,644 per ton of VOC reduced, depending on the size of the winery, fermentation tank configuration, type of wine, number of fermentation rotations, and other factors.

C.54.7 Evaluation Findings

As demonstrated above, District Rule 4694 meets RACT requirements.

The District commits to working closely with affected operators to undergo a regulatory amendment process for Rule 4694 as follows:

Modeling shows that the Valley is a NO_x-limited regime, especially in projections of future years. As such, VOC reductions are not as effective in reducing Valley ozone concentrations as NO_x reductions. The District will evaluate the technological achievability and economic feasibility of implementing emission control technologies to reduce VOC emissions from wine fermentation processes and potential benefits to help reduce ozone concentrations. Upon completion of this review, the District commits to amend Rule 4694 to include additional requirements to further reduce emissions from wine fermentation processes as appropriate by December 31, 2018.

C.55 RULE 4695 BRANDY AGING AND WINE AGING OPERATIONS

C.55.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOC	7.04	7.35	7.87	8.26	8.60	8.89	9.05	9.12	9.17

C.55.2 District Rule 4695 Description

Adopted on September 19, 2009, Rule 4695 is applicable to brandy aging and wine aging operations in the Valley. The purpose of this rule is to limit VOC emissions from these operations. EPA finalized approval of Rule 4695 on August 4, 2011 and deemed this rule as meeting RACT requirements.⁸⁶

C.55.3 How does District Rule 4695 compare with federal rules and regulations?

C.55.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.55.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.55.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.55.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.55.4 How does District Rule 4695 compare with California State regulations?

There are no state regulations applicable to this source category.

C.55.5 How does District Rule 4695 compare to regulations from other air districts?

⁸⁶ Environmental Protection Agency. EPA. *Revision to the State Implementation Plan, San Joaquin Valley Unified Air Pollution Control District*; Final rule. 76 Federal Register Fed. Reg. 150 (2011, August 4), pp. 47076 – 47077. (To be codified at 40 CFR Part 52). Retrieved from <http://www.gpo.gov/fdsys/pkg/FR-2011-08-04/pdf/2011-19384.pdf>

C.55.5.1 Bay Area AQMD

There are no analogous rules for this source category.

C.55.5.2 Sacramento Metro AQMD

There are no analogous rules for this source category.

C.55.5.3 South Coast AQMD

There are no analogous rules for this source category.

C.55.5.4 Ventura County APCD

There are no analogous rules for this source category.

C.55.6 Potential Emission Reduction Opportunities

No additional emissions reductions opportunities have been identified at this time. This determination is further supported by the District's 2013 Plan for the Revoked 1-hour Ozone Standard,⁸⁷ as approved by EPA.⁸⁸

C.55.7 Evaluation Findings

Rule 4695 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

⁸⁷ SJVAPCD. *2013 Plan for the Revoked 1-Hour Ozone Standard*. (2013, September 19). Retrieved from: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf

⁸⁸ EPA. *Clean Air Plans; 1-Hour and 1997 8-Hour Ozone Nonattainment Area Requirements; San Joaquin Valley, California*; final rule. 81 Fed. Reg. 65, pp. 19492 – 19495. (2016, April 5) (to be codified at 40 CFR Part 52).

C.56 RULE 4702 INTERNAL COMBUSTION ENGINES

C.56.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	16.83	11.68	8.16	7.30	6.46	5.79	5.36	5.16	5.05
VOC	1.55	1.27	0.96	0.89	0.79	0.73	0.69	0.67	0.66

C.56.2 District Rule 4702 Description

Rule 4702 applies to any internal combustion (IC) engine rated at 25 brake horsepower (bhp) or greater. The purpose of this rule is to limit NOx, carbon monoxide (CO), VOC, and SOx emissions from units subject to this rule.

The District's original IC engine rule, Rule 4701 (Internal Combustion Engines – Phase 1), was adopted on May 21, 1992, superseded by Rule 4702, adopted on August 21, 2003, and subsequently amended five times. The rule established NOx limits between 25-50 ppmv achieving 90-96% control for non-agricultural operation rich-burn engines, and 65-75 ppmv achieving 85-90% control for non-agricultural operation lean-burn engines. Through years of implementing increasingly stringent requirements, Rules 4701 and 4702 have achieved significant reductions of NOx and PM emissions.

Substantial emission reductions from agricultural IC engines have also been achieved through a combination of regulatory efforts and incentive actions. Rule 4702 has effectively reduced emissions from agricultural engines by 84% since the 2005 amendments to the rule, with substantial investments being made by the affected sources to comply with the rule. The rule was further strengthened in August 2011 when rule amendments implemented more stringent NOx limits as low as 11 ppmv for non-agricultural operations spark-ignited engines. Additional emission reductions are forthcoming under Rule 4702 as compliance dates for emission control requirements continue to approach over the coming years.

An internal combustion engine is any engine that operates by burning its fuel inside the engine. Engines generate power by the combustion of an air/fuel mixture. The main types of engines are spark-ignited engines and compression-ignited (or diesel) engines. In the case of spark-ignited engines, a spark plug ignites the air/fuel mixture. Spark-ignited engines come in several designs such as: two-stroke and four-stroke, rich-burn and lean-burn, turbocharged and naturally aspirated. Spark-ignited engines may use one or more fuels, such as natural gas, propane, butane, liquefied petroleum gas, oil field gas, digester gas, landfill gas, methanol, ethanol, and gasoline. Compression-ignited engines rely on heating of the inducted air during the compression stroke to ignite the injected diesel fuel. In addition to being classified into spark-ignited and compression-ignited, IC engines can be further classified as either two-stroke or four-stroke engines. Most diesel engines are four-stroke, while larger diesel engines often

are two-stroke. Natural gas-fired spark-ignited engines are usually four-stroke, but some operators prefer two-stroke engines for their applications.

Engines are used by a variety of private businesses and public agencies throughout the Valley for a number of purposes, primarily for powering pumps, compressors, or electrical generators. Examples of businesses and industries that use engines include: schools and universities, agriculture, oil and gas production and pipelines, petroleum refining, manufacturing facilities, food processing, electrical power generation, landfill and waste water treatment facilities, and water districts. Many engines are limited or low use in nature, such as emergency standby engines that provide backup power when electric service is interrupted.

C.56.3 How does District Rule 4702 compare with federal rules and regulations?

C.56.3.1 EPA – Control Technique Guidelines (CTG)

There are no EPA Control Technique Guidelines (CTG) requirements for this source category.

C.56.3.2 EPA – Alternative Control Technology (ACT)

C.56.3.2.1 EPA – 453/R-93-032 (Alternative Control Techniques Document – NOx Emissions from Stationary Reciprocating Internal Combustion Engines)

The District evaluated the requirements contained within the EPA – 453/R-93-032 ACT document and found no requirements that were more stringent than those already in Rule 4702.

C.56.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.56.3.3.1 40 CFR 60 Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines)

The District evaluated the requirements contained within 40 CFR 60 Subpart IIII and found no requirements that were more stringent than those already in Rule 4702.

C.56.3.3.2 40 CFR 60 Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines)

The District evaluated the requirements contained within 40 CFR 60 Subpart JJJJ and found no requirements that were more stringent than those already in Rule 4702.

C.56.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)**C.56.3.4.1 40 CFR 63 Subpart ZZZZ (NESHAP for Stationary Reciprocating Internal Combustion Engines)**

The District evaluated the requirements contained within 40 CFR 63 Subpart ZZZZ NESHAP and found no requirements that were more stringent than those already in Rule 4702.

C.56.4 How does District Rule 4702 compare with California State regulations?**C.56.4.1 17 CCR 93114 (ATCM to Reduce Particulate Emissions from Diesel-Fueled Engines—Standards for Nonvehicular Diesel Fuel)**

The District implements the requirements of 17 CCR 93114 through Rule 4702 and the District's new source review permitting program (Rule 2201).

C.56.4.2 17 CCR 93115 (ATCM for Stationary Compression Ignition Engines)

The District implements the requirements of 17 CCR 93115 through Rule 4702 and the District's new source review permitting program (Rule 2201).

C.56.5 How does District Rule 4702 compare to regulations from other air districts?**C.56.5.1 Bay Area AQMD****C.56.5.1.1 Regulation 9 Rule 8 (Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines)**

The District evaluated the requirements contained within BAAQMD's Regulation 9 Rule 8 and found no requirements that were more stringent than those already in Rule 4702.

C.56.5.2 Sacramento Metro AQMD**C.56.5.2.1 Rule 412 (Stationary Internal Combustion Engines Located at Major Stationary Sources of NOx)**

The District evaluated the requirements contained within SMAQMD's Rule 412 and found no requirements that were more stringent than those already in Rule 4702.

C.56.5.3 Ventura County APCD**C.56.5.3.1 Rule 74.9 (Stationary Internal Combustion Engines)**

The District evaluated the requirements contained within VCAPCD's Rule 74.9 and found no requirements that were more stringent than those already in Rule 4702.

C.56.5.4 South Coast AQMD

C.56.5.4.1 Rule 1110.2 (Emissions from Gaseous- and Liquid-Fueled Engines) and Rules 2000 – 2020 (RECLAIM program)

South Coast Air Quality Management District (SCAQMD) regulates the emissions from IC engines through a combination of control measures. SCAQMD 1110.2 is directly applicable to IC engines and includes emissions limitations for various applications. SCAQMD's RECLAIM program (Rules 2000 – 2020) allows most operators to purchase credits in lieu of instituting engine emissions controls otherwise required under SCAQMD 1110.2. Given these overlapping sets of requirements, Rule 4702 must be compared in context of both regulations. Additionally, many of the engine applications found in the Valley vary substantially from engine applications in SCAQMD; for example, engines used for agricultural irrigation pumping that exist in the Valley and are no longer found in SCAQMD. While not directly comparable, the following tables compare the emission limits between SCAQMD Rule 1110.2 and District Rule 4702.

Table C-5 Comparison of District and SCAQMD NOx Emission Limits for Non-Agricultural Operations (Non-AO) Spark-Ignited Waste Gas Engines Rated at > 50 bhp (corrected to 15% oxygen on a dry basis)

Engine Type	District NOx Limit (ppmv)	SCAQMD NOx Limit (ppmv)
Waste Gas Fueled (Rich-Burn)	50	<u>Until 01-01-16</u> bhp ≥ 500: 36 x ECF ⁸⁹ bhp < 500: 45 x ECF ⁹² <u>On and after 01-01-16</u> 11 ppmv
Waste Gas Fueled (Lean-Burn)	65 ppmv or 90% reduction	<u>Until 01-01-16</u> bhp ≥ 500: 36 x ECF ⁹² bhp < 500: 45 x ECF ⁹² <u>On and after 01-01-16</u> 11 ppmv

⁸⁹ The efficiency correction factor (ECF) is 1.0, unless: 1) The engine operator has measured the engine's net specific energy consumption, in compliance with ASME Performance Test Code PTC 17 -1973, at the average load of the engine; and 2) the ECF-corrected emission limit is made a condition of the engine's permit to operate. The ECF is never less than 1.0 so in some cases the SCAQMD limits could potentially be less stringent than the District's NOx limits.

Table C-6 Comparison of District and SCAQMD NOx Emission Limits for Non-AO Spark-Ignited Engines Rated > 50 bhp (corrected to 15% oxygen on a dry basis)

Engine Type	District NOx Limit (ppmv)	SCAQMD NOx Limit (ppmv)
1. Rich-Burn		
Rich-Burn Engine (except for below special applications)	11	11
Cyclic Loaded, Field Gas Fueled	50	11
Limited Use	25	11 ⁹⁰
2. Lean-Burn Engines		
Lean-Burn Engine (except for below special applications)	11	11
Two-Stroke, Gaseous Fueled, > 50 bhp and < 100 bhp	75	11
Limited Use	65	11
Lean-Burn Engine used for gas compression	65 ppmv or 93% reduction	11

Table C-7 Comparison of District and SCAQMD NOx Emission Limits for Agricultural Operations (AO) Spark-Ignited Engines Rated > 50 bhp (corrected to 15% oxygen on a dry basis)

Engine Type	District NOx Limit	SCAQMD NOx Limit
1. Rich-Burn	90 ppmv or 80% reduction	11
2. Lean-Burn	150 ppmv or 70% reduction	11
3. Certified and installed on or before June 16, 2005	Meet a Certified Spark-Ignited Engine Standard of HC + NOx < 0.6 g/bhp-hr	11

Medium and large operators in the South Coast Air Basin are most likely part of the South Coast RECLAIM program and are subsequently not required to meet the engine emission limitations included in Rule 1110.2. All facilities that emit over a certain threshold are required to participate in the RECLAIM program. As part of the RECLAIM program, certain companies receive emission allocations every year, usable for 12 months. The portion of the allocation not needed to offset the operator's own emissions can be sold to other companies. If the operator does not receive an emission allocation, they must buy emission credits from operators with unused emission allocations. In this way, the RECLAIM program is similar to a cap-and-trade program. The District does not have a RECLAIM-type program for this source category; therefore, all operators are required to meet the stringent emission limitations included in Rule 4702.

⁹⁰ SCAQMD exempt units that operate less than 500 hours from this limit; District defines "limited use" units as those operating less than 4,000 hours and only exempts engines operating less than 200 hours.

Although the SCAQMD emission level of 11 ppm has not yet been proven as technologically feasible in agricultural settings and it is unclear what percentage of facilities are complying with the current SCAQMD NO_x limits for non-ag categories, the District evaluated the cost-effectiveness and feasibility of implementing an 11 ppmv NO_x emission limit for the following categories of IC engines:

- Non-Agricultural Operations (Non-AO) Waste Gas Engines
- Non-AO Spark-Ignited Engines
 - Cyclic Loaded, Field Gas Fueled
 - Limited Use Engines
 - Lean-Burn Engines
 - Rich-Burn Engines
 - Two-Stroke, Gaseous Fueled Engines 50-100 bhp
 - Lean-Burn Engines Used for Gas Compression
- Agricultural Operations (AO) Spark-Ignited Engines

The District also evaluated the cost-effectiveness and feasibility of implementing intermediate NO_x emission limits for AO spark-ignited engines that more closely match the current NO_x emission limits for non-AO limited use rich-burn and lean-burn engines.

To determine potential emissions reductions, the District used the following equations:

$$\text{NO}_x = (\text{BHP} \times \text{HR} \times \text{EF} \times \text{LF}) / (\text{CF})$$

Where:

NO _x	=	Current annual NO _x emissions or potential annual NO _x emissions in ton/year
BHP	=	engine power
HR	=	annual hours of operation
EF	=	NO _x emission factor
LF	=	engine load factor
CF	=	conversion factor from grams to pounds

The estimated annual NO_x emissions reduction was calculated using the following equation:

$$\text{Potential Emissions Reduction} = \text{current annual NO}_x \text{ emissions} - \text{potential NO}_x \text{ annual NO}_x \text{ emissions}$$

NON-AGRICULTURAL OPERATIONS (NON-AO) WASTE GAS ENGINES

The District analyzed the technological feasibility of lowering the NO_x emission limit for waste gas engines and determined that due to the variability of waste gas, additional levels of NO_x control on existing waste gas engines can pose significant technical and feasibility challenges. Waste gas includes landfill gas, which is generated at landfills, and digester gas, which is generated from anaerobic digestion. Both landfill and digester gas result from the decomposition of organic matter by microorganisms in the absence of oxygen. Unlike pipeline natural gas, the composition of waste gas is not consistent or guaranteed. The heating value and composition of the gas (e.g. methane and oxygen contents) will vary with the type of materials that enter the landfill or digester and can also fluctuate seasonally or even daily. Both landfill and digester gases contain impurities, such as siloxanes, sulfur compounds, and halides. Landfill gas also contains entrained particulate matter, and both landfill and digester gas may contain particulate that results from combustion of the impurities in the gas. The contaminants in waste gas can coat and/or poison catalysts, rendering them ineffective. Because of its variable composition and contaminants, untreated waste gas is not interchangeable with pipeline-quality natural gas, and extensive and costly cleanup would be necessary to allow the use of catalytic emission controls needed to achieve 11 ppmv. This is not a practical option for most existing waste gas-fired engines, which were not designed to include the required gas systems and catalytic controls.

In addition to the District's efforts to identify additional potential technology options for this category, SCAQMD has also been evaluating this issue. In February 2008, SCAQMD amended Rule 1110.2 to include an 11 ppmv limit for waste gas engines rated at > 50 bhp. The original compliance date for this emissions limit was July 1, 2012, with the assumption that SCAQMD would complete a Technology Assessment to verify the feasibility of available control technologies for waste gas engines. However, SCAQMD had to amend Rule 1110.2 in September 2012 to extend the compliance deadline for waste gas engines from 2012 to 2016 in order to allow for more time to complete their Final Technology Assessment, which is currently still incomplete and has yet to identify feasible technology options. Additionally, these sources may also be in a position to avoid installing additional NO_x control technologies through their participation in SCAQMD's RECLAIM program.

District Rule 4702 contains the most stringent limits feasible for existing waste gas-fueled engines based on the use of combustion processes that minimize emissions without the use of post-combustion catalytic controls. Therefore, Rule 4702 meets or exceeds RACT for non-AO waste gas-fueled spark-ignited engines.

OTHER NON-AO SPARK-IGNITED ENGINES

Cyclic Loaded, Field Gas Fueled

Cyclic-loaded, field gas fueled engines can achieve some level of control, but not the stringent level of control that can be imposed on engines that operate in a narrow and more stable range of loads. The exhaust gas temperature of cyclic loaded engines

varies as a function of the engine load; however, catalyst chemistry is dependent on a minimum temperature to be effective in reducing emissions. When the cyclic load engine is operating in a particular engine load range, the exhaust gas temperature can reach the catalyst's effective range and allow for emissions to be well-controlled; however, as the engine cycles out of this load range, the exhaust gas temperature becomes too low for effective emissions control. Since the exhaust temperature fluctuates frequently for this category of units, it is technologically infeasible to require a lower NO_x limit for cyclic loaded field-gas fueled engines. The current emission limit for this category of engines meets or exceeds RACT for these sources.

Limited Use Engines

During the 2011 amendments to Rule 4702, the District created this category of engines based on the high costs and cost effectiveness associated with the installation of additional controls for these engines (< 4,000 hours of operation). As discussed in the staff report, the NO_x emission reductions foregone from not lowering the existing NO_x limits to 11 ppmv for limited use engines was insignificant (about 0.004 tons per day in 2011).⁹¹

However, because the evaluation was conducted in 2011, the District re-evaluated the cost effectiveness of lowering the NO_x emission limits to 11 ppmv for limited use non-AO rich-burn and lean-burn engines. The costs in the analyses below were gathered from information in the District's Permits database, IC engine manufacturers, and operators.

Limited Use Lean-Burn Engines

When evaluating the ability to lower NO_x emissions to 11 ppmv, an operator can either retrofit the existing lean-burn IC engine with a selective catalytic reduction (SCR) system or install a new lean-burn engine with an SCR system. In many cases, retrofitting an existing IC engine is technologically infeasible or may require substantial additional unanticipated costs (such as the incompatibility of an older engine with less sophisticated operating controls with additional control technology, additional labor/maintenance costs, etc.). However, for the purpose of evaluating all potential controls, the District has included both options in the below analysis.

⁹¹ SJVAPCD. (2011, August 18). *Adopt Revised Proposed Amendments to Rule 4702 (Internal Combustion Engines)*. Retrieved from http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2011/August/Agenda_Item_10_Aug_18_2011.pdf

Table C-8 Annual Costs for Retrofitting an Existing Limited Use Lean-Burn Engine and Installing a New Limited Use Lean-Burn Engine with SCR

Item	Assumptions/Methodology	Cost
Average Engine Power Rating	1,100 brake horsepower (bhp)	n/a
Annual Operation	2,500 hours (hr)	n/a
Capital Costs		
New Engine Cost (without SCR)	Includes: engine, freight, installation, start-up, additional equipment (belt guards, fuel connection, etc.), and tax	\$110,656
Annualized Engine Capital Costs (10 years, 10%)	0.163 x New Engine Cost	\$18,037
SCR Equipment Costs		
SCR System	\$73,000 per engine	\$73,000
550 gallon double wall plastic urea tank and accessories	\$5,270 per tank	\$5,270
3 hp rotary screw air compressor with dryer and receiver tank	\$5,875 per compressor package	\$5,875
Total SCR Equipment Costs	Equipment costs x 20% profit/mark-up	\$100,974
SCR Installation Costs		
Start-up and Commissioning Rate	\$1,500/day; assume 1 day for each system	\$1,500
Electrical upgrade to power compressor	n/a	\$0
Total SCR Installation Costs		\$1,500
Total SCR Capital Costs	SCR Equipment Costs + SCR Installation Costs	\$102,474
Annualized SCR Capital Costs (10 years, 10%)	0.163 x Total SCR Capital Costs	\$16,703
Annual Operating and Maintenance Costs		
Annual Reagent (urea) Cost	\$3 per gallon; 1 gallon/hr Cost = \$3 x 2,500 hr	\$7,500
Annual Increase in Fuel Cost (due to drop in fuel efficiency with SCR)	Fuel usage = 9,322.5 standard cubic feet per hour (scf/hr) Fuel cost (per 1,000 scf) = \$7.36 Fuel cost (per hour) = (9,322.5 x \$7.36) / 1,000 Fuel cost (per year) = hourly cost x 2,500 hr 2.5% drop in fuel efficiency Added Fuel Cost = Annual fuel cost x 2.5%	\$4,288
Annual Electricity Cost (for compressor)	3 hp compressor = 2.24 kW power rating Electricity rate for industrial operations = \$0.132/kW-hr Hourly electricity cost = 2.24 kW x \$0.132/kW-hr Daily meter charge = \$49.281 Annual electricity cost = hourly cost x 2500 hr Annual meter charge = daily meter charge x 365 days Total utility cost = Annual electricity cost + Annual meter charge	\$18,728

Item	Assumptions/Methodology	Cost
Annual Catalyst Cost	Life of catalyst = 5 years Cost per catalyst = \$5,000 Catalyst costs for 10 years = \$5,000 x 2 Annualized cost = \$10,000 x 0.163	\$1,630
Annual Maintenance Cost	Maintenance = \$0.02 per bhp per hour of operation Annual cost = \$0.02 x 1,100 bhp x 2,500 hr	\$55,000
Annual Operating & Maintenance (O&M) Costs	Annual O&M = Annual Reagent Cost+ Annual Increase in Fuel Cost + Annual Electricity Cost + Annual Catalyst Cost + Annual Maintenance Cost	\$87,147
Annual Cost for Retrofit of LB Engine with SCR	Annualized SCR Capital Cost + Annual O&M Cost	\$103,850
Annual Cost for New LB Engine with SCR	Annualized Engine Capital Cost + Annualized SCR Capital Cost + Annual O&M Cost	\$121,887

The emissions reductions are calculated below:

$$\begin{aligned}
 \text{BHP} &= 1,100 \text{ bhp} \\
 \text{HR} &= 2,500 \text{ hours/year (hr/yr)} \\
 \text{EF1} &= 0.78 \text{ g-NOx/bhp-hr (equivalent to 65 ppmvd NOx at 15\% O}_2\text{; assuming 35\% thermal efficiency)} \\
 \text{EF2} &= 0.132 \text{ g-NOx/bhp-hr (equivalent to 11 ppmvd NOx at 15\% O}_2\text{; assuming 35\% thermal efficiency)} \\
 \text{LF} &= 0.8 \\
 \text{CF} &= 453.6 \text{ grams/pound (g/lb)}
 \end{aligned}$$

$$\begin{aligned}
 \text{Current NOx} &= (\text{BHP} \times \text{HR} \times \text{EF1} \times \text{LF}) / (\text{CF}) \\
 &= (1,100 \text{ bhp} \times 2,500 \text{ hr/yr} \times 0.78 \text{ g-NOx/bhp-hr} \times 0.8) / (453.6 \text{ g/lb}) \\
 &= 3,783 \text{ lb-NOx/year}
 \end{aligned}$$

$$\begin{aligned}
 \text{Potential NOx} &= (\text{BHP} \times \text{HR} \times \text{EF2} \times \text{LF}) / (\text{CF}) \\
 &= (1,100 \text{ bhp} \times 2,500 \text{ hr/yr} \times 0.132 \text{ g-NOx/bhp-hr} \times 0.8) / (453.6 \text{ g/lb}) \\
 &= 640 \text{ lb-NOx/year}
 \end{aligned}$$

$$\begin{aligned}
 \text{Potential Emissions Reduction} &= \text{Current NOx} - \text{Potential NOx} \\
 \text{Potential Emissions Reduction} &= (3,783 - 640 \text{ lb}) \times (1 \text{ ton} / 2,000 \text{ lb}) \\
 \text{Potential Emissions Reduction} &= \mathbf{1.57 \text{ tons/year}}
 \end{aligned}$$

Cost Effectiveness: The cost effectiveness is the added cost, in dollars per year, of the control technology, divided by the emissions reductions achieved, in tons per year. Based on the calculations above, the cost effectiveness of retrofitting or replacing current limited use lean-burn spark-ignited engines is as follows:

- Retrofit limited use lean-burn engine with SCR: \$66,146/ton of NOx reduced
- New limited use lean-burn engine with SCR: \$77,635/ton of NOx reduced

As demonstrated in the analysis and summary above, it is not cost effective to require the retrofit or replacement of limited use lean-burn engines to achieve 11 ppmv.

Limited Use Rich-Burn Engines

When evaluating the ability to lower NOx emissions to 11 ppmv, an operator will generally retrofit the existing rich-burn IC engine with a nonselective catalytic reduction (NSCR) system. In many cases, retrofitting an existing IC engine is technologically infeasible or may require substantial additional unanticipated costs (such as the incompatibility of an older engine with less sophisticated operating controls with additional control technology, additional labor/maintenance costs, etc.). However, for the purpose of evaluating potential controls in this category, the District has included the less costly, potentially feasible scenario of retrofitting an existing rich-burn engine with NSCR in the below analysis.

Table C-9 Annual Costs for Retrofitting an Existing Limited Use Rich-Burn Engine

Item	Assumptions/Methodology	Cost
Average Engine Power Rating	500 bhp	n/a
Annual Operation	2,500 hours (hr)	n/a
Capital Costs		
New Catalyst System	Includes: catalyst, air-to fuel ratio controller, ignition system, and installation	\$75,000
Annualized Catalyst Capital Cost (10 years, 10%)	0.163 x New Catalyst System	\$12,225
Annual Cost for Retrofit of RB Engine with New Catalyst	Annualized Catalyst Capital Cost	\$12,225

The emissions reductions are calculated below:

$$\begin{aligned}
 \text{BHP} &= 500 \text{ bhp} \\
 \text{HR} &= 2,500 \text{ hours/year (hr/yr)} \\
 \text{EF1} &= 0.30 \text{ g-NOx/bhp-hr (equivalent to 25 ppmvd NOx at 15\% O}_2\text{; assuming 35\% thermal efficiency)} \\
 \text{EF2} &= 0.132 \text{ g-NOx/bhp-hr (equivalent to 11 ppmvd NOx at 15\% O}_2\text{; assuming 35\% thermal efficiency)} \\
 \text{LF} &= 0.8 \\
 \text{CF} &= 453.6 \text{ grams/pound (g/lb)}
 \end{aligned}$$

$$\begin{aligned}
 \text{Current NOx} &= (\text{BHP} \times \text{HR} \times \text{EF1} \times \text{LF}) / (\text{CF}) \\
 &= (500 \text{ bhp} \times 2,500 \text{ hr/yr} \times 0.30 \text{ g-NOx/bhp-hr} \times 0.8) / (453.6 \text{ g/lb}) \\
 &= 661 \text{ lb-NOx/year}
 \end{aligned}$$

$$\begin{aligned}\text{Potential NOx} &= (\text{BHP} \times \text{HR} \times \text{EF2} \times \text{LF}) / (\text{CF}) \\ &= (500 \text{ bhp} \times 2,500 \text{ hr/yr} \times 0.132 \text{ g-NOx/bhp-hr} \times 0.8) / (453.6 \text{ g/lb}) \\ &= 291 \text{ lb-NOx/year}\end{aligned}$$

$$\begin{aligned}\text{Potential Emissions Reduction} &= \text{Current NOx} - \text{Potential NOx} \\ \text{Potential Emissions Reduction} &= (661 - 291 \text{ lb}) \times (1 \text{ ton} / 2,000 \text{ lb})\end{aligned}$$

Potential Emissions Reduction = 0.19 tons/year

Cost Effectiveness: The cost effectiveness is the added cost, in dollars per year, of the control technology, divided by the emissions reductions achieved, in tons per year. Based on the calculations above, the cost effectiveness of retrofitting limited use rich-burn spark-ignited engines is as follows:

- Retrofitted limited use rich-burn non-AO engine with new catalyst:
\$64,342/ton of NOx reduced

As demonstrated in the analysis and summary above, it is not cost effective to require the retrofit of limited use rich-burn engines to achieve 11 ppmv, even without including additional substantial costs, such as annual operating and maintenance costs.

Two-Stroke, Gaseous Fueled Engines 50-100 bhp

There is no control technology compatible with two-stroke, gaseous fueled engines, including SCR, which will allow these units to achieve a NOx emission limit below 75 ppmv. An 11 ppmv NOx emission limit is not technologically feasible for these engines; the current limit implements RACT for two-stroke, gaseous fueled engines less than 100 bhp.

Lean-Burn Engines Used in Gas Compression

Similar to the "Limited Use" engine category, during the 2011 amendments to Rule 4702, the District created this category of engines based on the technological infeasibility to control these types of engines. Lean-burn engines used in gas compression in the Valley are used in natural gas distribution and storage service, and these engines frequently experience changing load conditions. As noted in EPA's Stationary IC Engine Technical Support Document⁹², SCR use is problematic for these engines due to the fluctuations over a broad range of conditions. For this reason, EPA states that there is an insufficient basis to conclude that SCR is an appropriate technology for large lean-burn engines used for gas compression. The current emission limit is achievable through low-NOx combustion technology, which includes changes to the engine's timing, enhanced control of the air-fuel ratio, and other changes that lower NOx emissions. Due to the technological complexities associated with lean-burn engines used in gas compression, the current emissions limit implements RACT for these units.

⁹² EPA. (2003, October). *Stationary Reciprocating Internal Combustion Engines Technical Support Document for NOx SIP Call*.

AO SPARK-IGNITED ENGINES

Over the past decade, AOs have invested significant capital to retrofit and replace thousands of irrigation pump and other engines reducing emissions by over 80% in this category, and continue to do so as emission limitations and associated compliance deadlines come into effect under Rule 4702. In addition to the high cost-effectiveness and potential technical infeasibility associated with retrofitting or replacing existing AO spark-ignited engines, requiring additional costly controls on existing AO engines is economically challenging and potentially infeasible.

AO Rich-Burn and Lean-Burn Engine Retrofit Evaluation

Retrofitting existing spark-ignited rich-burn and lean-burn engines poses several challenges that are not present when installing new, replacement engines. The District had to overcome many obstacles and challenges in retrofitting existing AO engines when the District adopted its current emission limits and has worked closely with AO engine owners and operators and control system manufacturers to ensure compliance with this stringent emission limit. Efforts to ensure compliance with the current rule limit are continuing today. However, lowering the emission limits even further would present a number of challenges with respect to technological feasibility as outlined in the following list.

1. Engine power losses from adding controls
2. Existing engines may require overhaul
3. Existing engines cannot meet lower emissions levels due to narrower margin of compliance
4. Control systems must be custom designed
5. Errors generated during control system installation
6. Retrofit controls can damage an engine
7. Engine can damage a control system
8. Compliance costs
9. Engines operated in remote locations

1. Engine power losses from adding controls

An engine is chosen based on its ability to provide the required power output at a reasonable engine speed (rpm) that will not over-stress the engine over its expected service life. Add-on emission control systems result in additional loads that the engine may not have been originally designed to accommodate. In addition, due to the extreme drought conditions, engine owners and operators have needed to increase the power output for well pump engines as the water table has dropped. As the engines work harder to pump water, there is less power output available to accommodate emission control systems.

2. Existing engines may require overhaul

The engines in use at AOs have been in service for many years, even decades, and are heavily worn. A worn engine can burn oil, leak fluids, and run rough. For an uncontrolled engine, some of the effects of engine wear do not have a major effect on the engine's ability to do its job (e.g. pumping water). However, the operation of a catalytic emission control system requires that the engine be operated consistently smooth. An expensive major engine overhaul or rebuild would be necessary to ensure smooth engine operation prior to installing a catalytic emission control system. Many AOs do not have the resources (e.g., staff, experience, technical training, etc.) to complete an engine overhaul or rebuild without outside assistance. Meeting more stringent/lower emission standards increases the need for the engine to operate properly.

3. Existing engines cannot meet lower emissions levels due to narrower margin of compliance

As emission limits are lowered, there is a narrower margin of compliance and proper engine operation becomes more critical. AOs in the District have to constantly ensure that their engine is properly maintained and within all the appropriate specifications to ensure compliance with the current emission limit, more so than newer engines. The lower emissions levels will result in additional stresses on the engine and increased maintenance and monitoring efforts that result from operating a retrofitted engine. Even then, due to the age of the engine and based on engine not appropriately designed for additional add-on systems and the associated loads, engines will not be able to meet the lower limits.

4. Control systems must be custom designed

For proper control system design, the engine condition, make, model, power output, and exhaust gas flow rate and temperature must be considered. There are no universal, off-the-shelf, one size-fits-all systems available for purchase. Control system design also assumes that an engine is operating properly and smoothly per the engine manufacturer's specifications. To ensure proper operation of the control system, an engine may need to be overhauled or rebuilt prior to installation of the control system. A common problem with many retrofit emission control systems is installation of a system on an engine that is not operating smoothly or to engine manufacturer specifications. Installing a control system on a rough running engine will result in poor control system operation and eventually system and engine damage. Proper system design and engine operation is more important as emission limits are lowered since the margin of compliance will be much less.

5. Errors generated during control system installation

Site conditions like gas supply pressure can cause an existing engine to operate rough. If site issues are not addressed prior to installation of a control system, the control system will not operate correctly. An installer may attempt to correct rough engine

operation by making the combustion more fuel rich; however, this technique will not provide lasting results and will cause accelerated engine and control system wear and eventually failure. An emission control system that is designed to meet lower emission limits will require a larger catalyst element which will be more expensive to replace if permanently damaged.

6. Retrofit controls can damage an engine

For proper control of exhaust pollutants, a catalyst must be operated at a certain temperature range that is higher than normal exhaust temperatures. Additional fuel is often injected into the engine with the intent that the additional fuel will pass through the combustion chamber and ignite in the exhaust system prior to the catalyst (the high catalyst temperature ignites the fuel). This extra fuel results in higher engine operating temperatures since some of the extra fuel is combusted during normal engine combustion. The increased engine temperature leads to accelerated engine wear and reduced engine reliability. Due to wear and older design, increased combustion temperatures lead to engine failure and permanent engine damage.

7. Engine can damage a control system

An existing, worn engine can burn oil and run rough. Oil in the exhaust stream will foul/mask a catalyst which will result in reduced emission control efficiency and likely permanent damage to a catalyst element. The air-fuel ratio controller will attempt to adjust engine operation (e.g., injecting more fuel) to keep the control system operating within the specified parameters; however, adjusting engine operation will not correct a fouled catalyst. Continued operation with a damaged catalyst will lead to permanent catalyst damage. An emission control system that is designed to meet lower emission limits will require a larger catalyst element which will be more expensive to replace if permanently damaged and this cycle will be repeated further adding to the cost.

8. Compliance costs

Unlike many industries, AOs compete on an international basis and cannot pass increased production costs on to consumers. AOs must absorb the compliance costs associated with lower emission standards, for example: retrofit and replacement costs; additional maintenance costs; additional monitoring costs; and additional testing costs. These additional regulatory costs put them at an economic disadvantage to their competitors.

9. Engines operated in remote locations

AO spark-ignited engines are generally located in rural, hard to access areas with minimal oversight since AOs have limited resources and staffing. With seasonal labor and minimal year-round staffing, it is difficult for AOs to provide the frequent and complex maintenance required for retrofitted or new engines equipped with advanced emission controls. Lower emission limits are achieved only through well maintained engines and control systems. Lower emissions limits lead to increased maintenance

and monitoring efforts. The oil production industry is the only other major industry in the Valley that has IC engines located in remote locations; however, with the highly technical nature of oil production and refining as compared to agricultural production and additional economic resources, it is feasible for the oil and gas production industry to hire qualified staff dedicated to maintaining and operating IC engines and other equipment on-site.

Retrofitting AO engines with emission control systems to meet increasingly stringent emission limits poses unique challenges that are not applicable when replacing engines. Based on the challenges outlined above, meeting 25 ppm or even 11 ppmv with existing AO engines is not feasible. The additional maintenance, monitoring, and testing, along with the cost of rebuilding engines and the cost of the emission control system, may even be more costly than installing a replacement engine.

AO Lean-Burn Engine Replacement with SCR

When evaluating the ability to lower NO_x emissions, an agricultural operator can install a new lean-burn engine with an SCR system. The cost-effectiveness analysis to lower emissions to 11 ppmv is as follows:

Table C-10 Annual Costs for Installing a New AO Lean-Burn Engine with SCR

Item	Assumptions/Methodology	Cost
Average Engine Power Rating	241 bhp	n/a
Annual Operation	2,500 hours (hr)	n/a
Capital Costs (Engine)		
New Engine Cost (without SCR)	Includes: engine, freight, installation, start-up, additional equipment (belt guards, fuel connection, etc.), and tax	\$109,480
Annualized Engine Capital Costs (10 years, 10%)	0.163 x New Engine Cost	\$17,845
SCR Equipment Costs		
SCR System	\$73,000 per engine	\$73,000
550 gallon double wall plastic urea tank and accessories	\$5,270 per tank	\$5,270
3 hp rotary screw air compressor with dryer and receiver tank	\$5,875 per compressor package	\$5,875
Total SCR Equipment Costs	Equipment costs x 20% profit/mark-up	\$100,974
SCR Installation Costs		
Start-up and Commissioning Rate	\$1,500/day; assume 1 day for each system	\$1,500
Electrical upgrade to power compressor	\$43.22/foot; avg. 1,020 feet to extend electrical line	\$44,084
Total SCR Installation Costs		\$45,584
Total SCR Capital Costs	SCR Equipment Costs + SCR Installation Costs	\$146,558

Item	Assumptions/Methodology	Cost
Annualized SCR Capital Costs (10 years, 10%)	0.163 x Total SCR Capital Costs	\$23,889
Annual Operating and Maintenance Costs (SCR)		
Annual Reagent (urea) Cost	\$3 per gallon; 1 gallon/hr Cost = \$3 x 2,500 hr	\$7,500
Annual Increase in Fuel Cost (due to drop in fuel efficiency with SCR)	Fuel usage = 1,750.7 standard cubic feet per hour (scf/hr) Fuel cost (per 1,000 scf) = \$7.36 Fuel cost (per hour) = (1,750.7 x \$7.36) / 1,000 Fuel cost (per year) = hourly cost x 2,500 hr 2.5% drop in fuel efficiency Added Fuel Cost = Annual fuel cost x 2.5%	\$805
Annual Electricity Cost (for compressor)	3 hp compressor = 2.24 kW power rating Electricity rate for AO = \$0.136/kW-hr Hourly electricity cost = 2.24 kW x \$0.136/kW-hr Annual electricity cost = hourly cost x 2,500 hr	\$761
Annual Catalyst Cost	Life of catalyst = 5 years Cost per catalyst = \$5,000 Catalyst costs for 10 years = \$5,000 x 2 Annualized cost = \$10,000 x 0.163	\$1,630
Annual Maintenance Cost	Maintenance = \$0.02 per bhp per hour of operation Annual cost = \$0.02 x 241 bhp x 2,500 hr	\$12,050
Annual Operating & Maintenance (O&M) Costs	Annual O&M = Annual Reagent Cost+ Annual Increased Fuel Cost + Annual Electricity Cost + Annual Catalyst Cost + Annual Maintenance Cost	\$22,746
Annual Cost for New LB Engine with SCR	Annualized Engine Capital Cost + Annualized SCR Capital Cost + Annual O&M Cost	\$64,480

*The values within this table are rounded.

The emissions reductions are calculated below:

$$\begin{aligned}
 \text{BHP} &= 241 \text{ bhp} \\
 \text{HR} &= 2,500 \text{ hours/year (hr/yr)} \\
 \text{EF1} &= 2.092 \text{ g-NOx/bhp-hr (equivalent to 150 ppmv)} \\
 \text{EF2} &= 0.132 \text{ g-NOx/bhp-hr (equivalent to 11 ppmv)} \\
 \text{LF} &= 0.65 \\
 \text{CF} &= 453.6 \text{ grams/pound (g/lb)}
 \end{aligned}$$

$$\begin{aligned}
 \text{Current NOx} &= (\text{BHP} \times \text{HR} \times \text{EF1} \times \text{LF}) / (\text{CF}) \\
 &= (241 \text{ bhp} \times 2,500 \text{ hr/yr} \times 2.092 \text{ g-NOx/bhp-hr} \times 0.65) / (453.6 \text{ g/lb}) \\
 &= 1,806 \text{ lb-NOx/year}
 \end{aligned}$$

$$\begin{aligned}
 \text{Potential NOx} &= (\text{BHP} \times \text{HR} \times \text{EF2} \times \text{LF}) / (\text{CF}) \\
 &= (241 \text{ bhp} \times 2,500 \text{ hr/yr} \times 0.132 \text{ g-NOx/bhp-hr} \times 0.65) / 453.6 \\
 &= 114 \text{ lb-NOx/year}
 \end{aligned}$$

Potential Emissions Reduction = Current NO_x – Potential NO_x
 Potential Emissions Reduction = (1,806-114 lb) x (1 ton / 2,000 lb)
Potential Emissions Reduction = 0.85 tons/year

Cost Effectiveness: The cost effectiveness is the added cost, in dollars per year, of the control technology, divided by the emissions reductions achieved, in tons per year. Based on the calculations above, the cost effectiveness of replacing current AO lean-burn spark-ignited engines is as follow:

- New lean-burn engine with SCR: \$75,859/ton of NO_x reduced

As demonstrated in the analysis and summary above, it is not cost effective to replace existing AO lean-burn engines with newer engines equipped with SCR systems.

Since new lean-burn engines equipped with SCR systems are now all currently designed and sold to meet NO_x emissions levels of 11 ppmv, there is not a more cost-effective option available to meet an intermediate emissions level of 25 ppmv through the purchase of new lean-burn engines equipped with SCR.

AO Lean-Burn Engine Replacement without SCR

When evaluating the ability to lower NO_x emissions to 65 ppmv, an agricultural operator can replace the existing lean-burn IC engine with a new lean-burn engine certified to meet 65 ppmv without the need of an SCR system.

Table C-11 Annual Costs for Installing a New AO Lean-Burn Engine

Item	Assumptions/Methodology	Cost
Average Engine Power Rating	241 bhp	n/a
Annual Operation	2,500 hours (hr)	n/a
Capital Costs (Engine)		
New Engine Cost (without SCR)	Includes: engine, freight, installation, start-up, additional equipment (belt guards, fuel connection, etc.), and tax	\$109,480
Annualized Engine Capital Costs (10 years, 10%)	0.163 x New Engine Cost	\$17,845
Annual Operating and Maintenance Costs		
Annual Maintenance Cost	Maintenance = \$0.01 per bhp per hour of operation Annual cost = \$0.01 x 241 bhp x 2,500 hr	\$6,025
Annual Cost for New LB Engine	Annualized Engine Capital Cost + Annual O&M Cost	\$23,870

*The values within this table are rounded.

The emissions reductions are calculated below:

BHP	=	241 bhp
HR	=	2,500 hours/year (hr/yr)
EF1	=	2.092 g-NOx/bhp-hr (equivalent to 150 ppmv)
EF2	=	0.78 g-NOx/bhp-hr (equivalent to 65 ppmv)
LF	=	0.65
CF	=	453.6 grams/pound (g/lb)

$$\begin{aligned} \text{Current NOx} &= (\text{BHP} \times \text{HR} \times \text{EF1} \times \text{LF}) / (\text{CF}) \\ &= (241 \text{ bhp} \times 2,500 \text{ hr/yr} \times 2.092 \text{ g-NOx/bhp-hr} \times 0.65) / (453.6 \text{ g/lb}) \\ &= 1,806 \text{ lb-NOx/year} \end{aligned}$$

$$\begin{aligned} \text{Potential NOx} &= (\text{BHP} \times \text{HR} \times \text{EF2} \times \text{LF}) / (\text{CF}) \\ &= (241 \text{ bhp} \times 2,500 \text{ hr/yr} \times 0.78 \text{ g-NOx/bhp-hr} \times 0.65) / 453.6 \\ &= 673 \text{ lb-NOx/year} \end{aligned}$$

$$\begin{aligned} \text{Potential Emissions Reduction} &= \text{Current NOx} - \text{Potential NOx} \\ \text{Potential Emissions Reduction} &= (1,806 - 673 \text{ lb}) \times (1 \text{ ton} / 2,000 \text{ lb}) \end{aligned}$$

Potential Emissions Reduction = 0.57 tons/year

Cost Effectiveness: The cost effectiveness is the added cost, in dollars per year, of the control technology, divided by the emissions reductions achieved, in tons per year. Based on the calculations above, the cost effectiveness of replacing current AO lean-burn spark-ignited engines is as follows:

- New lean-burn engine: \$41,877/ton of NOx reduced

As demonstrated in the analysis and summary above, it is not cost effective to replace existing AO lean-burn engines with newer engines.

AO Rich-Burn Engine Replacement with 3-Way Catalyst Meeting 11 ppmv

When evaluating the ability to lower NOx emissions, an agricultural operator can install a new rich-burn engine with a 3-way catalyst. The cost-effectiveness is shown below:

Table C-12 Annual Cost for Installing a New AO Rich-Burn Engine with a 3-way Catalyst

Item	Assumptions/Methodology	Cost
Average Engine Power Rating	256 bhp	n/a
Annual Operation	2,500 hours (hr)	n/a
Total Capital Costs		
New Engine Cost	Includes: engine with 3-way catalyst, freight, installation, and tax	\$95,000
Annualized Engine Capital Costs (10 years, 10%)	0.163 x New Engine Cost	\$15,485
Annual Operating and Maintenance Costs (SCR)		
Annual Added Fuel Cost (due to drop in fuel efficiency with catalyst)	Fuel usage = 1,859.7 scf/hr Fuel cost (per 1,000 scf) = \$7.36 Fuel cost (per hour) = (1,859.7 x \$7.36) / 1,000 Fuel cost (per year) = hourly cost x 2,500 hr Assume 2.5% drop in fuel efficiency Added Fuel cost = Annual fuel cost x 2.5%	\$855
Annual Catalyst Cost	Life of catalyst = 5 years Cost per catalyst = \$5,000 Catalyst costs for 10 years = \$5,000 x 2 Annualized Catalyst Cost = \$10,000 x 0.163	\$1,630
Annual Maintenance Cost	Maintenance = \$0.02 per bhp per hour of operation Annual Maintenance Cost = \$0.02 x 256 bhp x 2,500 hr	\$12,800
Annual Operating & Maintenance (O&M) Costs	Annual O&M = Annual Added Fuel Cost + Annual Catalyst Cost + Annual Maintenance Cost	\$15,285
Annual Cost for New RB Engine with 3-way	Annualized Engine Capital Cost + Annual O&M Cost	\$30,770

*The values within the above table are rounded.

The emissions reductions are calculated below:

$$\begin{aligned}
 \text{BHP} &= 256 \text{ bhp} \\
 \text{HR} &= 2,500 \text{ hours/year} \\
 \text{EF1} &= 1.255 \text{ g-NOx/bhp-hr (equivalent to 90 ppmv)} \\
 \text{EF2} &= 0.132 \text{ g-NOx/bhp-hr (equivalent to 11 ppmv)} \\
 \text{LF} &= 0.65 \\
 \text{CF} &= 453.6 \text{ grams/pound}
 \end{aligned}$$

$$\begin{aligned}
 \text{Current NOx} &= (\text{BHP} \times \text{HR} \times \text{EF1} \times \text{LF}) / (\text{CF}) \\
 &= (256 \text{ bhp} \times 2,500 \text{ hr/yr} \times 1.255 \text{ g-NOx/bhp-hr} \times 0.65) / 453.6 \\
 &= 1,151 \text{ lb-NOx/year}
 \end{aligned}$$

$$\begin{aligned}
 \text{Potential NOx} &= (\text{BHP} \times \text{HR} \times \text{EF2} \times \text{LF}) / (\text{CF}) \\
 &= (256 \text{ bhp} \times 2,500 \text{ hr/yr} \times 0.132 \text{ g-NOx/bhp-hr} \times 0.65) / 453.6 \\
 &= 121 \text{ lb-NOx/year}
 \end{aligned}$$

Potential Emissions Reduction = Current NO_x – Potential NO_x
 Potential Emissions Reduction = (1,151-121 lb) x (1 ton / 2,000 lb)
Potential Emissions Reduction = 0.52 tons/year

Cost Effectiveness: The cost effectiveness is the added cost, in dollars per year, of the control technology, divided by the emissions reductions achieved, in tons per year. Based on the calculations above, the cost effectiveness of replacing current AO rich-burn engines is as follows:

- New rich-burn engine with a 3-way catalyst to meet 11 ppmv: \$59,173/ton of NO_x reduced

As demonstrated in the analysis and summary above, it is not cost effective to replace existing spark-ignited engines with new rich-burn engines with 3-way catalysts meeting 11 ppmv.

AO Rich-Burn Engine Replacement with 3-Way Catalyst Meeting 25 ppmv

In order to meet 25 ppmv, an agricultural operator can install a new rich-burn engine with a slightly smaller catalyst compared to the catalyst needed to meet an 11 ppmv emission level.

Table C-13 Annual Cost for Installing a New AO Rich-Burn Engine with a 3-way Catalyst

Item	Assumptions/Methodology	Cost
Average Engine Power Rating	256 bhp	n/a
Annual Operation	2,500 hr	n/a
Total Capital Costs		
New Engine Cost	Includes: engine with 3-way catalyst, freight, installation, and tax	\$95,000
Annualized Engine Capital Costs (10 years, 10%)	0.163 x New Engine Cost	\$15,485
Annual Operating and Maintenance Costs (SCR)		
Annual Added Fuel Cost (due to drop in fuel efficiency with catalyst)	Fuel usage = 1,859.7 scf/hr Fuel cost (per 1,000 scf) = \$7.36 Fuel cost (per hour) = (1,859.7 x \$7.36) / 1,000 Fuel cost (per year) = hourly cost x 2,500 hr Assume 2.5% drop in fuel efficiency Added Fuel cost = Annual fuel cost x 2.5%	\$855
Annual Catalyst Cost	Life of catalyst = 5 years Cost per catalyst = \$4,000 Catalyst costs for 10 years = \$4,000 x 2 Annualized Catalyst Cost = \$8,000 x 0.163	\$1,304
Annual Maintenance Cost	Maintenance = \$0.02 per bhp per hour of operation Annual Maintenance Cost = \$0.02 x 256 bhp x 2,500 hr	\$12,800

Item	Assumptions/Methodology	Cost
Annual Operating & Maintenance (O&M) Costs	Annual O&M = Annual Added Fuel Cost + Annual Catalyst Cost + Annual Maintenance Cost	\$14,959
Annual Cost for New RB Engine with 3-way	Annualized Engine Capital Cost + Annual O&M Cost	\$30,444

*The values within the above table are rounded.

The emissions reductions are calculated below:

BHP	=	256 bhp
HR	=	2,500 hours/year
EF1	=	1.255 g-NOx/bhp-hr (equivalent to 90 ppmv)
EF2	=	0.30 g-NOx/bhp-hr (equivalent to 25 ppmv)
LF	=	0.65
CF	=	453.6 grams/pound

$$\begin{aligned} \text{Current NOx} &= (\text{BHP} \times \text{HR} \times \text{EF1} \times \text{LF}) / (\text{CF}) \\ &= (256 \text{ bhp} \times 2,500 \text{ hr/yr} \times 1.255 \text{ g-NOx/bhp-hr} \times 0.65) / 453.6 \\ &= 1,151 \text{ lb-NOx/year} \end{aligned}$$

$$\begin{aligned} \text{Potential NOx} &= (\text{BHP} \times \text{HR} \times \text{EF2} \times \text{LF}) / (\text{CF}) \\ &= (256 \text{ bhp} \times 2,500 \text{ hr/yr} \times 0.30 \text{ g-NOx/bhp-hr} \times 0.65) / 453.6 \\ &= 275 \text{ lb-NOx/year} \end{aligned}$$

$$\begin{aligned} \text{Potential Emissions Reduction} &= \text{Current NOx} - \text{Potential NOx} \\ \text{Potential Emissions Reduction} &= (1,151 - 275 \text{ lb}) \times (1 \text{ ton} / 2,000 \text{ lb}) \\ \text{Potential Emissions Reduction} &= \mathbf{0.44 \text{ tons/year}} \end{aligned}$$

Cost Effectiveness: The cost effectiveness is the added cost, in dollars per year, of the control technology, divided by the emissions reductions achieved, in tons per year. Based on the calculations above, the cost effectiveness of replacing current AO rich-burn engines is as follows:

- New rich-burn engine with a 3-way catalyst to meet 25 ppmv: \$69,191/ton of NOx reduced

As demonstrated in the analysis and summary above, it is not cost effective to replace existing spark-ignited engines with new rich-burn engines with 3-way catalysts meeting 25 ppmv.

Since new rich-burn engines equipped with 3-way catalysts are now all currently designed and sold to meet NOx emissions levels of 25 ppmv, there is not a more cost-effective option available to meet an intermediate emissions level of 65 ppmv through the purchase of new rich-burn engines.

C.56.7 Potential Emission Reduction Opportunities

As discussed above, there are no additional emission reduction opportunities at this time for Rule 4702.

C.56.8 Evaluation Findings

Rule 4702 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.57 RULE 4703 STATIONARY GAS TURBINES

C.57.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	3.17	2.84	2.98	2.89	2.94	2.99	3.03	3.04	3.06
VOC	0.71	0.69	0.72	0.73	0.74	0.76	0.77	0.78	0.78

C.57.2 District Rule 4703 Description

The provisions of this rule are applicable to all stationary gas turbine systems, which are subject to District permitting requirements, and with electrical generation ratings equal to or greater than 0.3 megawatt (MW) or a maximum heat input rating of more than 3 million British Thermal Units per hour (MMBtu/hr), and that are used for the generation of electrical power. The purpose of this rule is to limit NOx emissions from these stationary gas turbines.

Rule 4703 was adopted on August 18, 1994. Since its adoption, the rule has been amended six times. The latest rule amendment in September 2007 strengthened the rule by establishing more stringent NOx limits for existing stationary gas turbines. EPA finalized approval for Rule 4703 on October 21, 2009 and deemed this rule as being at least as stringent as established RACT requirements. NOx emissions have been controlled by over 86% for this source category.

The requirements of Rule 4703 affect owners and operators of stationary gas turbine systems used to pump, compress, generate electricity, or perform other tasks. The four major industry groups are oil and gas production, utilities, manufacturing, and government.

In complying with the rule, all affected entities are required to control NOx and CO emissions by installing approved emissions control devices. Early in the rule development process, the District identified five different emissions control technologies that could be used to achieve proposed limits for stationary gas turbines. Of the five options, four mainly control NOx emissions, while the other one controls CO emissions. The four NOx control technologies are:

- Dilutant (water or steam) injection systems,
- Dry, low-NOx,
- Selective catalytic reduction, and
- SCONox

Costs associated with different compliance options vary a great deal depending on technologies and available products. Depending on the size of the existing turbine systems, engine model and make, type of existing emissions control equipment, and many other factors, owners and operators of stationary gas turbine systems face different compliance costs. The impacts of Rule 4703 have been concentrated in the oil

and gas production sector and utilities sector of the Valley, as they own and operate the vast majority of stationary gas turbines subject to the rule.

C.57.3 How does District Rule 4703 compare with federal rules and regulations?

C.57.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.57.3.2 EPA – Alternative Control Technology (ACT)

C.57.3.2.1 EPA-435/R-93-007 (Alternative Control Techniques Document—NOx Emissions from Stationary Gas Turbines)

The requirements of Rule 4703 are as stringent as or more stringent than the requirements in the ACT.

C.57.3.3 Standards of Performance for New Stationary Sources (NSPS)

C.57.3.3.1 40 CFR 60 Subpart GG (Standards of Performance for Stationary Gas Turbines)

The requirements of Rule 4703 are as stringent as or more stringent than the requirements in the NSPS.

C.57.3.3.2 40 CFR 60 Subpart KKKK (Standards of Performance for Stationary Combustion Turbines)

The requirements of Rule 4703 are as stringent as or more stringent than the requirements in the NSPS.

C.57.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

C.57.3.4.1 40 CFR 63 Subpart YYYY (NESHAP for Stationary Combustion Turbines)

The requirements of Rule 4703 are as stringent as or more stringent than the requirements in the NESHAP.

C.57.4 How does District Rule 4703 compare with California State regulations?

There are no state regulations applicable to this source category.

C.57.5 How does District Rule 4703 compare to regulations from other air districts?

C.57.5.1 Bay Area AQMD**C.57.5.1.1 Regulation 9 Rule 9 (Nitrogen Oxides from Stationary Gas Turbines)**

The requirements in Rule 4703 are as stringent as or more stringent than those in Rule 9-9.

C.57.5.2 Sacramento Metro AQMD**C.57.5.2.1 Rule 413 (Stationary Gas Turbines)**

The requirements in Rule 4703 are as stringent as or more stringent than those in Rule 413.

C.57.5.3 South Coast AQMD**C.57.5.3.1 Rule 1134 (Emissions of Oxides of Nitrogen from Stationary Gas Turbines)**

The requirements in Rule 4703 are as stringent as or more stringent than those in Rule 1134.

C.57.5.4 Ventura County APCD**C.57.5.4.1 Rule 74.23 (Stationary Gas Turbines)**

The requirements in Rule 4703 are as stringent as or more stringent than those in Rule 74.23.

C.57.6 Potential Emission Reduction Opportunities

In its *2015 PM_{2.5} Plan* the District evaluated this source category to determine if there are any feasible emission reduction opportunities. The District found that Rule 4703 currently has in place the most stringent measures feasible to implement in the Valley.⁹³ The District re-evaluated the aforementioned options and has determined that no additional feasible opportunities have been developed in the last 12 months since the adoption of the *2015 PM_{2.5} Plan*. Therefore, there are no additional emission reduction opportunities at this time.

C.57.7 Evaluation Findings

Rule 4703 currently has in place the most stringent measures feasible to implement in the Valley and therefore meets or exceeds federal RACT requirements for this source category.

⁹³ SJVUAPCD. *2015 Plan for the 1997 PM_{2.5} Standard*. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

C.58 RULE 4902 RESIDENTIAL WATER HEATERS

C.58.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	1.48	1.44	1.39	1.34	1.28	1.29	1.31	1.32	1.32
VOC	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.12	0.12

C.58.2 District Rule 4902 Description

Adopted July 17, 1993, Rule 4902 is a point-of-sale rule that limits NOx emissions from natural gas-fired residential water heaters with heat input rates less than or equal to 75,000 Btu/hr. The original rule enforced a NOx emissions limit of 40 nanograms of NOx per Joule of heat output (ng/J). Amendments in March 2009 strengthened the rule by enforcing a limit of 10 ng/J for new or replacement water heaters and a limit of 14 ng/J for instantaneous water heaters. NOx emissions have been controlled by approximately 88% for this source category. EPA finalized approval for Rule 4902 on May 5, 2010.⁹⁴

As a point-of-sale rule, Rule 4902 affects water heater manufacturers, plumbing wholesalers, retail home supply stores, plumbers and contractors, and homeowners. This source category encompasses several types of water heaters, including conventional storage water heaters, demand water heaters, heat pump water heaters, solar water heaters, and tankless coil and indirect water heaters. Water heater options also vary by fuel type which includes electricity, fuel oil, geothermal energy, natural gas, propane, and solar energy.

Conventional storage water heaters are the most common. They have an insulated tank sized from 20 to 80 gallons and natural gas fired units have a gas burner under the tank regulated by a thermostat. Demand water heaters, also known as instantaneous water heaters, heat water as it is required and do not use a storage tank. As soon as there is a demand for hot water, a gas burner heats cold water as it travels through a pipe in the unit. Natural gas-fired units generally provide hot water at a rate upwards of 5 gallons per minute.

A tankless coil water heater heats water flowing through a heat exchanger installed in a furnace or boiler. Similar to the tankless coil water heater an indirect water heater uses a furnace or boiler. Fluid heated by the furnace or boiler is circulated through a heat exchanger in a storage tank.

⁹⁴ EPA. *Revisions to the California State Implementation Plan, San Joaquin Valley Unified Air Pollution Control District*; Final Rule. 75 Fed. Reg. 86, pp. 24408 – 24409. (2010, May 5), (to be codified at 40 CFR 52) retrieved from: <http://www.gpo.gov/fdsys/pkg/FR-2010-05-05/pdf/2010-10404.pdf>

Manufacturers have focused on combustion modification to meet the lower NO_x limit as required in other California air districts. Combustion modification systems are designed to reduce thermal NO_x formation by changing the flame characteristics to reduce peak flame temperature. Combustion modification for residential water heaters is achieved by different burner designs such as low NO_x and ultra-low NO_x burners. Some of the design principles used in low NO_x and ultra-low NO_x burners include staged air burners, staged fuel burners, pre-mix burners, internal recirculation, and radiant burners.

C.58.3 How does District Rule 4902 compare with federal rules and regulations?

C.58.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.58.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.58.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.58.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

C.58.4 How does District Rule 4902 compare with California State regulations?

There are no state regulations applicable to this source category.

C.58.5 How does District Rule 4902 compare to regulations from other air districts?

C.58.5.1 Bay Area AQMD

C.58.5.1.1 Regulation 9 Rule 6 (Nitrogen Oxides Emissions from Natural Gas-Fired Boilers and Water Heaters)

The requirements in Rule 4902 are as stringent as or more stringent than those in Rule 9-6.

C.58.5.2 Sacramento Metro AQMD

C.58.5.2.1 Rule 414 (Water Heaters, Boilers and Process Heaters Rated Less than 1,000,000 BTU per Hour)

The requirements in Rule 4902 are as stringent as or more stringent than those in Rule 414.

C.58.5.3 South Coast AQMD

C.58.5.3.1 Rule 1121 (Control of Nitrogen Oxides from Residential Type, Natural Gas-Fired Water Heaters)

The requirements in Rule 4902 are as stringent as or more stringent than those in Rule 1121.

C.58.5.4 Ventura County APCD

C.58.5.4.1 Rule 74.11 (Natural Gas-Fired Water Heaters)

The requirements in Rule 4902 are as stringent as or more stringent than those in Rule 74.11.

C.58.6 Potential Emission Reduction Opportunities

In its *2015 PM_{2.5} Plan* the District evaluated this source category to determine if there are any feasible emission reduction opportunities. The District found that Rule 4902 currently has in place the most stringent measures feasible to implement in the Valley.⁹⁵ The District re-evaluated the aforementioned options and has determined that no additional feasible opportunities have been developed in the last 12 months since the adoption of the *2015 PM_{2.5} Plan*. Therefore, there are no additional emission reduction opportunities at this time.

C.58.7 Evaluation Findings

According to the federal CAA §182(b)(2) and (f) this source category is not subject to federal RACT requirements because this source category has no sources subject to EPA CTGs and these sources are not “major sources” of VOCs and NO_x, as confirmed by EPA in the Technical Support Document (TSD) for the partial approval of the Districts 2009 RACT SIP.⁹⁶ However, pursuant to the District’s No Stone Left Unturned philosophy, Rule 4902 was evaluated as a part of this plan development effort.

⁹⁵ SJVUAPCD. *2015 Plan for the 1997 PM_{2.5} Standard*. Appendix C Best Available Control Measures and Most Stringent Measures (2015, April 16). Retrieved from http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm

⁹⁶ U.S. EPA. Region IX Air Division. Technical Support Document for EPA’s Notice of Proposed Rulemaking for the California State Implementation Plan. Prepared by Stanley Tong. (2011, August 29). <https://www.regulations.gov/#!documentDetail;D=EPA-R09-OAR-2011-0723-0006>

Rule 4902 currently has in place the most stringent measures feasible to implement in the Valley and therefore would meet or exceed federal RACT requirements for this source category were they applicable. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.59 RULE 4905 NATURAL GAS-FIRED, FAN-TYPE CENTRAL FURNACES

C.59.1 Emissions Inventory (Summer Average – Tons per day)

	2012	2015	2018	2021	2024	2027	2029	2030	2031
NOx	2.62	2.68	2.78	2.87	2.93	2.95	2.99	3.01	3.03
VOC	0.21	0.21	0.21	0.22	0.23	0.23	0.23	0.23	0.24

C.59.2 District Rule 4905 Description

Rule 4905 is a point-of-sale rule applicable to any person who sells, offers for sale, installs or solicits the installation of natural-gas-fired, fan-type central furnaces, for use within the Valley with a rated heat input capacity of less than 175,000 Btu/hour, and for combination heating and cooling units with a rated cooling capacity of less than 65,000 Btu/hour. Affected parties include furnace manufacturers, residential heating wholesalers, supply stores, contractors and end-users. The point-of-sale approach has allowed the District to achieve NOx reductions without placing an undue financial burden on the residents, operators and businesses that sell these units in the Valley.

Rule 4905 was adopted on October 20, 2005 to establish NOx limits for residential central furnaces supplied, sold, or installed in the Valley. EPA finalized approval for Rule 4905 on May 30, 2007.⁹⁷ The District's Governing Board adopted amendments to Rule 4905 on January 22, 2015 making it the most stringent rule in the nation for this source category. The following is a summary of the amendments:

- Lower the NOx emission limit for residential units from 40 ng/J (0.093 lb/MMBtu) to 14 ng/J
- Expand the rule applicability to include non-residential units with a NOx emission limit of 14 ng/J and units installed in manufactured homes with a NOx limit of 40 ng/J, to be lowered to 14 ng/J in 2018
- Additional labeling requirements

Rule 4905 applies to furnaces fueled by natural gas that use forced air distribution, the most common type of heating system for residential and commercial buildings. Central furnaces are controlled by a thermostat, which sends signals to turn the device on or off when the building temperature does not match a chosen set point. A valve then opens to send natural gas to the burners, which combust the gas directly into the heat exchangers. A blower pulls air from outside the building through a filter, across the heat exchanger, and through a series of ducts and vents to different areas of the building. Exhaust from the combustion exits the building through a separate duct. Condensing units use an additional heat exchanger to extract the latent heat in the flue (exhaust)

⁹⁷ EPA. *Revisions to the California State Implementation Plan, San Joaquin Valley Unified Air Pollution Control District*, Direct Final Rule. 72 Fed. Reg. 103, pp. 29886 – 29889. (2007, May 30). (to be codified at 40 CFR Part 52), Retrieved from <http://www.gpo.gov/fdsys/pkg/FR-2007-05-30/pdf/E7-10236.pdf>

gas by cooling the combustion gasses to near ambient temperature and thereby increase the heating efficiency by up to 10%. The water vapor in the flue gas is condensed, collected, and drained.

Applicable units are used in approximately 71% of Valley residences and are not labeled for retail as “residential” or “commercial” furnaces. Units used in commercial buildings, which are subject to the requirements of Rule 4905 as of the January 2015 amendments, are essentially the same as residential units with the exception of possible differences in usage patterns and indoor/outdoor location. Research for the analyses in the January 2015 amendments estimated 1,252,190 residential and commercial units will be operating in the Valley in 2017. Replacement will occur gradually as these units reach the end of the 20-year useful life.

Units installed in manufactured homes utilize the same types of materials and operating principles as commercial and residential units; however, significant differences exist. Furnaces installed in manufactured homes use sealed combustion, meaning all of the combustion air is taken from outside the building. These units also pre-heat the air, typically to 50-60°F, using a concentric vent where the combustion air is drawn in through the outer ring, while exhaust gases are vented through the inside core of the vent pipe. The air is pre-heated because the cold outside air does not mix well with the fuel, while pre-heated air blends well and allows for quieter ignition and combustion. Furnaces installed in manufactured homes also have to comply with strict space restrictions.⁹⁸

C.59.3 How does District Rule 4905 compare with federal rules and regulations?

C.59.3.1 EPA – Control Technique Guidelines (CTG)

EPA CTG requirements are not applicable to this source category.

C.59.3.2 EPA – Alternative Control Technology (ACT)

EPA ACT requirements are not applicable to this source category.

C.59.3.3 Standards of Performance for New Stationary Sources (NSPS)

EPA NSPS requirements are not applicable to this source category.

C.59.3.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

EPA NESHAP and MACT requirements are not applicable to this source category.

⁹⁸ U.S. Department of Energy. (2014, July 7). *Energy Conservation Program for Consumer Products: Energy Conservation Standards for Residential Furnace Fans*. Retrieved 9/23/14 from <https://www.federalregister.gov/articles/2014/07/03/2014-15387/energy-conservation-program-for-consumer-products-energy-conservation-standards-for-residential>.

C.59.4 How does District Rule 4905 compare with California State regulations?

There are no state regulations applicable to this source category.

C.59.5 How does District Rule 4905 compare to regulations from other air districts?**C.59.5.1 Bay Area AQMD****C.59.5.1.1 Regulation 9 Rule 4 (Nitrogen Oxides from Fan Type Residential Central Furnaces)**

The requirements in Rule 4905 are as stringent as or more stringent than those in Rule 9-4.

C.59.5.2 Sacramento Metro AQMD**C.59.5.2.1 Rule 414 (Water Heaters, Boilers and Process Heaters Rated Less than 1,000,000 BTU per Hour)**

The requirements in Rule 4905 are as stringent as or more stringent than those in Rule 414.

C.59.5.3 South Coast AQMD**C.59.5.3.1 Rule 1111 (Reduction of NOx Emissions from Natural Gas-Fired, Fan-Type Central Furnaces)**

The requirements in Rule 4905 are as stringent as or more stringent than those in Rule 1111.

C.59.5.4 Ventura County APCD**C.59.5.4.1 Rule 74.22 (Natural Gas-Fired, Fan-Type Central Furnaces)**

The requirements in Rule 4905 are as stringent as or more stringent than those in Rule 74.22.

C.59.6 Potential Emission Reduction Opportunities

No additional emissions reductions opportunities have been identified at this time.

C.59.7 Evaluation Findings

Pursuant to federal Clean Air Act §182(b)(2) and (f), this source category is not subject to federal RACT requirements, because this source category has no sources subject to EPA CTGs and these sources are not “major sources” of VOCs and NOx. However, Rule 4905 currently has in place the most stringent measures feasible to implement in the Valley and therefore would meet or exceed federal RACT requirements for this

source category were they applicable. As the District continues to develop future attainment plans to address increasingly stringent federal air quality standards, this source category will be re-evaluated for additional potential opportunities to reduce emissions.

C.60 EMISSION INVENTORY CODES

The following are the emission inventory codes used for the allocation of emissions as presented in this attainment plan.

Table 14 Emission Inventory Codes

Control Measure	Emission Inventory Codes
Rule 4103 (Open Burning)	670-660-0262-9842; 670-660-0262-9862; 670-660-0262-9874; 670-660-0262-9884; 670-660-0262-9888; 670-660-0262-9892; 670-662-0262-9878; 670-668-0200-9858; 670-668-0200-9872; 670-668-0200-9886; 670-995-0240-9848
Rule 4106 (Prescribed Burns)	670-666-0200-0000; 670-670-0200-0000
Rule 4301 (Fuel Burning Equipment)	None
Rule 4302 (Incinerator Burning)	130-130-0110-0000; 130-130-0130-0000; 130-130-0240-0000; 130-130-0324-0000; 130-130-0266-0000
Rule 4307 (Boilers, Steam Generators and Process Heaters 2 – 5 MMBtu/hr)	010-005-0110-0000; 010-005-0124-0000; 010-005-0130-0000; 010-005-0300-0000; 010-005-1220-0000; 020-005-0110-0000; 030-005-0110-0000; 030-005-0124-0000; 030-005-0130-0000; 030-005-1220-0000; 030-005-1530-0000; 030-010-0110-0000; 030-010-0130-0000; 030-010-1220-0000; 030-010-1600-0000; 030-015-0110-0000; 030-015-0130-0000; 040-005-0110-0000; 040-005-1530-0000; 040-010-0100-0000; 040-010-0110-0000; 040-010-0120-0000; 040-010-0130-0000; 040-010-1000-0000; 050-005-0110-0000; 050-005-0122-0000; 050-005-0124-0000; 050-005-0130-0000; 050-005-0320-0000; 050-005-1100-0000; 050-005-1220-0000; 050-005-1510-0000; 050-005-1520-0000; 050-005-3220-0000; 050-010-0110-0000; 050-010-0120-0000; 050-010-0320-0000; 050-010-1220-0000; 050-010-1500-0000; 052-005-0110-0000; 052-005-0124-0000; 052-005-1220-0000; 052-010-0110-0000; 052-010-0120-0000; 052-010-1224-0000; 060-005-0110-0000; 060-005-0122-0000; 060-005-0124-0000; 060-005-0130-0000; 060-005-0142-0000; 060-005-0144-0000; 060-005-0320-0000; 060-005-1220-0000; 060-005-1510-0000; 060-005-1520-0000; 060-010-0100-0000; 060-010-0110-0000; 060-010-0120-0000; 060-010-0142-0000 The EICs are the same for Rules 4306/4320, 4307, and 4308; the three rules share a combined emission inventory. Baseline emissions from the 2008 and 2009 rule amendments of these rules were used to determine the percentage of emissions for each rule. Those respective percentages are applied to the combined inventory to get the individual emission inventories.

Control Measure	Emission Inventory Codes
Rule 4308 (Boilers, Steam Generators and Process Heaters 0.075 to less than 2.0 MMBtu/hr)	The EICs are the same for Rules 4306/4320, 4307, and 4308; the three rules share a combined emission inventory. Baseline emissions from the 2008 and 2009 rule amendments of these rules were used to determine the percentage of emissions for each rule. Those respective percentages are applied to the combined inventory to get the individual emission inventories. See Rule 4307 for the EICs.
Rule 4309 (Dryers)	430-422-7078-0000; 430-424-7006-0000; 430-995-7000-0000; 499-995-0000-0000; 499-995-5630-0000
Rule 4311 (Flares)	110-132-0130-0000; 110-132-0146-0000; 120-132-0136-0000; 130-132-0110-0000; 130-132-0130-0000; 130-132-0136-0000; 310-320-0010-0000; 310-320-0110-0000; 310-320-0120-0000; 310-320-0130-0000; 310-320-0136-0000; 310-320-1600-0000; 320-320-0010-0000; 320-320-0110-0000; 320-320-0120-0000; 320-320-0130-0000
Rule 4313 (Lime Kilns)	Lime kilns are not included in the ARB emissions inventory. There are no lime kilns currently operating in the Valley.
Rule 4320 (AERO for Boilers, Steam Generators, and Process Heaters >5 MMBtu/hr)	The EICs are the same for Rules 4306/4320, 4307, and 4308; the three rules share a combined emission inventory. Baseline emissions from the 2008 and 2009 rule amendments of these rules were used to determine the percentage of emissions for each rule. Those respective percentages are applied to the combined inventory to get the individual emission inventories. See Rule 4307 for the EICs.
Rule 4352 (Solid Fuel Fired Boilers, Steam Generators, and Process Heaters)	010-005-0214-0000; 010-005-0218-0000; 010-005-0220-0000; 010-005-0240-0000; 010-005-0243-0000; 010-005-0254-0000; 020-005-0218-0000; 020-005-0230-0000; 030-005-0214-0000; 050-005-0214-0000; 050-005-0240-0000; 050-005-0254-0000; 052-005-0240-0000; 060-005-0240-0000; 060-005-0264-0000
Rule 4354 (Glass Melting Furnaces)	460-460-7037-0000; 460-460-7038-0000; 460-460-7039-0000
Rule 4401 (Steam-Enhanced Crude Oil Production Wells)	310-342-1600-0000; 310-344-1600-0000; 310-346-1600-0000; 310-348-1600-0000
Rule 4402 (Crude Oil Production Sumps)	310-300-1600-0000
Rule 4404 (Heavy Oil Test Station - Kern County)	310-350-1600-0000
Rule 4407 (In-Situ Combustion Well Vents)	The emissions from this source category are accounted for in Rule 4401.
Rule 4408 (Glycol Dehydration Systems)	The emissions from this source category are accounted for in Rule 4409.
Rule 4409 (Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities)	310-302-0110-0000; 310-302-1600-0000; 310-304-1600-0000; 310-306-1600-0000; 310-308-1600-0000; 310-308-0110-0000; 310-310-0110-0000; 310-310-1600-0000; 310-316-1600-0000; 310-352-0100-0000; 310-356-0110-0000

Control Measure	Emission Inventory Codes
Rule 4453 (Refinery Vacuum Producing Devices or Systems)	The emissions from this source category are accounted for in Rule 4409.
Rule 4454 (Refinery Process Unit Turnaround)	The emissions from this source category are accounted for in Rule 4409.
Rule 4455 (Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants)	320-302-0010-0000; 320-304-0010-0000; 320-306-0010-0000; 320-316-0010-0000
Rule 4565 (Biosolids, Animal Manure, and Poultry Litter Operations)	199-170-0240-0000; 199-170-0260-0000; 199-190-0010-0000; 199-190-0110-0000; 199-190-0300-0000; 199-995-0000-0000; 199-995-0130-0000; 199-995-0240-0000; 199-995-0260-0000; 199-995-0300-0000; 199-995-0324-0000 The EICs are the same for Rules 4565 and 4566; the two rules share a combined emission inventory.
Rule 4566 (Organic Material Composting Operations)	The EICs are the same for Rules 4565 and 4566; the two rules share a combined emission inventory.
Rule 4570 (Confined Animal Facilities)	620-618-0262-0101; 620-618-0262-0102; 620-618-0262-0103; 620-618-0262-0104; 620-618-0262-0105; 620-618-0262-0106; 620-618-0262-0107; 620-618-0262-0108; 620-618-0262-0109; 620-618-0262-0110; 620-618-0263-0000
Rule 4601 (Architectural Coatings)	520-520-91XX-0000; 520-520-92XX-0000
Rule 4602 (Motor Vehicle Assembly Coatings)	The emissions from this source category are accounted for in Rule 4612.
Rule 4603 (Surface Coating of Metal Parts and Products, Plastic Parts and Products, and Pleasure Crafts)	230-226-9000-0000; 230-226-9100-0000; 230-226-9200-0000; 230-230-9020-0000; 230-230-9050-0000; 230-230-9052-0000; 230-230-9054-0000; 230-230-9100-0000; 230-230-9200-0000
Rule 4604 (Can and Coil Coating Operations)	230-228-9000-0000; 230-228-9020-0000; 230-228-9052-0000; 230-228-9057-0000; 230-228-9100-0000; 230-228-9200-0000
Rule 4605 (Aerospace Assembly and Component Coating Operations)	230-238-9000-0000, 230-238-9020-0000; 230-238-9100-0000, 230-238-9200-0000
Rule 4606 (Wood Products and Flat Wood Paneling Products Coating Operations)	230-232-9000-0000; 230-232-9020-0000; 230-232-9040-0000; 230-232-9052-0000; 230-232-9054-0000; 230-232-9100-0000; 230-232-9200-0000
Rule 4607 (Graphic Arts and Paper, Film, Foil, and Fabric Coatings)	230-222-9000-0000, 230-222-9100-0000, 230-224-9200-0000; 240-240-3202-0000; 240-240-3314-0000; 240-240-8302-0000; 240-260-8400-0000; 240-262-8400-0000; 240-264-8400-0000; 240-266-8350-0000; 240-266-8400-0000; 240-268-8400-0000; 240-995-8000-0000; 240-995-8400-0000
Rule 4610 (Glass Coating Operations)	The emissions from this source category are accounted for in Rule 4354.
Rule 4612 (Motor Vehicle and Mobile Equipment Coating Operations)	230-218-9000-0000; 230-218-9010-0000; 230-218-9020-0000; 230-218-9050-0000; 230-218-9054-0000; 230-218-9100-0000; 230-218-9200-0000

Control Measure	Emission Inventory Codes
Rule 4621 (Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plants)	330-395-1100-0000; 330-374-1100-0000; 330-330-1110-0000; 330-397-1100-0000; 330-390-1100-0000; 330-390-1400-0000; 330-396-1100-0000; 330-330-1000-0000; 330-376-1100-0000; 330-382-1100-0000; 330-384-1100-0000; 330-384-1110-0000; 330-382-1110-0000; 330-382-1120-0000; 330-384-1120-0000; 330-390-0010-0000
Rule 4622 (Gasoline Transfer into Motor Vehicle Fuel Tanks)	330-378-1100-0000; 330-380-1100-0000
Rule 4623 (Storage of Organic Liquids)	310-326-1600-0000; 310-328-1600-0000; 310-995-1600-0000; 320-326-1000-0000; 320-326-1214-0000; 320-326-1410-0000; 320-326-1610-0000; 320-328-1000-0000; 320-328-1110-0000; 320-328-1214-0000; 320-328-1410-0000; 320-328-1610-0000; 330-326-1110-0000; 330-326-1420-0000; 330-328-1000-0000; 330-328-1110-0000; 330-328-1600-0000; 330-328-1610-0000; 430-328-7006-0000
Rule 4624 (Transfer of Organic Liquid)	330-302-0010-0000; 330-995-0110-0000; 330-304-0010-0000; 330-995-0010-0000; 330-316-0010-0000; 330-318-0110-0000
Rule 4625 (Wastewater Separators)	320-340-0010-0000
Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations)	540-560-0400-0000; 540-562-0400-0000; 540-564-0400-0000; 540-566-0400-0000
Rule 4642 (Solid Waste Disposal Sites)	120-120-0240-0000; 120-122-0242-0000
Rule 4651 (Soil Decontamination Operations)	140-995-0010-0000; 140-995-0110-0000; 140-995-0120-0000; 140-995-0240-0000; 330-995-0010-0000
Rule 4652 (Coatings and Ink Manufacturing)	410-995-8400-0000; 410-407-9000-0000
Rule 4653 (Adhesives and Sealants)	250-292-8200-0000; 250-292-8202-0000; 250-292-8250-0000
Rule 4661 (Organic Solvents)	The emissions from this source category are accounted for in Rules 4662 and 4663.
Rule 4662 (Organic Solvent Degreasing Operations)	220-204-0500-0000; 220-204-3008-0000; 220-204-3022-0000; 220-204-3083-0000; 220-204-3176-0000; 220-204-3204-0000; 220-204-3246-0000; 220-204-3333-0000; 220-204-3339-0000; 220-204-3344-0000; 220-204-8104-0000; 220-204-8106-0000; 220-206-3083-0000; 220-206-3107-0000; 220-206-3246-0000; 220-206-3300-0000; 220-206-3301-0000; 220-206-3328-0000; 220-206-3344-0000; 220-206-3346-0000; 220-206-8106-0000
Rule 4663 (Organic Solvent Cleaning, Storage, and Disposal)	220-208-0500-0000; 220-208-3022-0000; 220-208-3083-0000; 220-208-3176-0000; 220-208-3204-0000; 220-208-3246-0000; 220-208-3333-0000; 220-208-3339-0000; 220-208-3344-0000; 220-208-3346-0000; 220-208-8104-0000; 220-208-8106-0000; 230-216-8350-0000; 230-240-0500-0000; 230-240-3008-0000; 230-240-3060-0000; 230-240-3202-0000; 230-240-3232-0000; 230-240-3252-0000; 230-240-3372-0000; 230-240-8300-0000; 230-240-8302-0000; 230-240-8350

Control Measure	Emission Inventory Codes
Rule 4672 (Petroleum Solvent Dry Cleaning Operations)	210-200-3300-00000; 210-200-8102-0000; 210-200-8150-0000
Rule 4681 (Rubber Tire Manufacturing)	410-402-0248-0000
Rule 4682 (Polystyrene, Polyethylene, and Polypropylene Products Manufacturing)	410-404-5034-0000; 410-404-5036-0000; 410-404-5038-0000; 410-404-5044-0000; 410-404-5046-0000
Rule 4684 (Polyester Resin Operations)	410-403-5018-0000; 410-404-5016-0000; 410-404-5028-0000; 410-404-5030-0000
Rule 4691 (Vegetable Oil Processing Operations)	420-420-6030-0000
Rule 4692 (Commercial Charbroiling)	690-680-6000-0000
4693 (Bakery Ovens)	420-412-6012-0000; 420-412-6037-0000
Rule 4694 (Wine Fermentation and Storage Tanks)	420-408-6090-0000
Rule 4695 (Brandy Aging and Wine Aging Operations)	420-410-6090-0000
Rule 4702 (Internal Combustion Engines)	010-040-0110-0000; 010-040-1200-0000; 020-040-0110-0000; 020-040-1200-0000; 030-040-0110-0000; 030-040-0124-0000; 030-040-1200-0000; 030-040-1210-0000; 040-040-0110-0000; 050-040-0012-0000; 050-040-0110-0000; 050-040-0124-0000; 050-040-1200-0000; 052-040-0110-0000; 052-040-1200-0000; 052-042-0110-0000; 052-042-1200-0000; 052-042-1200-0010; 052-042-1200-0011; 060-040-0110-0000; 060-040-0124-0000; 060-040-0142-0000; 060-040-0146-0000; 060-040-1100-0000; 060-040-1200-0000; 060-040-1210-0000; 060-995-1220-0000; 099-040-1200-0000
Rule 4703 (Stationary Gas Turbines)	010-045-0110-0000; 010-045-1200-0000; 020-045-0110-0000; 030-045-0110-0000; 040-045-0134-0000; 050-045-1200-0000; 060-045-0110-0000; 060-045-1200-0000
Rule 4902 (Residential Water Heaters)	610-608-0110-0000
Rule 4905 (Natural Gas – Fired, Fan Type Residential Central Furnace)	610-606-0110-0000; 060-020-0110-0000

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