

RULE 4694 WINE FERMENTATION AND STORAGE TANKS (Adopted December 15, 2005)

1.0 Purpose

The purpose of this rule is to reduce emissions of volatile organic compounds (VOC) from the fermentation and bulk storage of wine, or achieve equivalent reductions from alternative emission sources.

2.0 Applicability

This rule applies to any winery fermenting wine and/or storing wine in bulk containers.

3.0 Definitions

3.1 Air Pollution Control Officer (APCO): as defined in Rule 1020 (Definitions).

3.2 Air Resources Board (ARB or CARB): as defined in Rule 1020 (Definitions).

3.3 Baseline Fermentation Emissions (BFE): the average Uncontrolled Fermentation Emissions from wine fermentation, occurring at the winery during a given Baseline Period pursuant to Section 3.4, or as established by the Operator pursuant to section 3.3.3. For wineries with less than three consecutive years of fermentation activities, the baseline shall be established pursuant to Section 3.3.2 or Section 3.3.3.

3.3.1 The BFE shall be calculated as follows:

$$BFE = \frac{\sum UFE}{CY}$$

Where,

*BFE* = Baseline Fermentation Emissions

$\sum UFE$  = The sum of annual Uncontrolled Fermentation Emissions for a given Baseline Period

*CY* = The number of consecutive years used to establish the BFE for a given Baseline Period

3.3.2 If the winery does not have three consecutive years of fermentation data, *CY* shall equal the number of consecutive years of available fermentation data.

- 3.3.3 Operators may voluntarily establish their BFE provided that the BFE shall not be less than the BFE calculated pursuant to Section 3.3.1, and that the BFE shall not be greater than the operator's Potential to Emit for fermentation VOC emissions
- 3.4 Baseline Period: the three consecutive calendar years, immediately before the year of calculation of the Baseline Fermentation Emissions.
- 3.5 Batch: a quantity of must fermented at the same time in a fermenter.
- 3.6 Brix: the sugar content of grapes, juice, or wine. Each degree Brix is equivalent to 1 gram of sugar per 100 grams of grape juice.
- 3.7 Capture System: equipment, including but not limited to, hoods, ducts, fans, booths, and vents which are used to contain, capture, or transport an air pollutant to an emissions control device.
- 3.8 Certified Emissions Reductions (CER): the reduction of VOC or NO<sub>x</sub> emissions, from mobile, stationary, or area sources, which are actual, quantifiable, enforceable, and surplus at the time of use, as determined by the APCO.
- 3.9 Combined Capture and Control Efficiency (CCCE): the percent reduction in emissions achieved by an emissions control system. CCCE shall be calculated as follows:

$$CCCE = \%CSE \times \%CDE$$

Where,

*CCCE* = Combined Capture and Control Efficiency

*%CSE* = Capture System Efficiency, as established in the Permit To Operate

*%CDE* = Control Device Efficiency as established in the Permit To Operate

- 3.10 Compliance Period: the three consecutive calendar years immediately following the year of calculation of the Baseline Fermentation Emissions.
- 3.11 Continuous or Adjacent Property: a property consisting of two or more parcels of land with a common point or boundary, or separated solely by a public roadway or other public right-of-way.

- 3.12 Control Device: equipment that is used to reduce the amount of air pollutants in an exhaust stream before discharge to the ambient air.
- 3.13 Emission Control System: a system consisting of a capture system and control device.
- 3.14 Emission Reduction Duration: the period of time during which the action generating an emission reduction results in Certified Emission Reductions.
- 3.15 Fermentation: the action of yeast upon sugar to produce ethyl alcohol. Fermentation begins within a given fermenter when an operator inoculates the must with yeast or when the operator allows fermentation to begin naturally. Fermentation ends when the operator stops fermentation, when fermentation stops naturally, or when the fermenting juice reaches a sugar content of 4 degrees Brix, or less.
- 3.16 Fermentation Emission Reduction (FER): the reduction in VOC emissions from the total volume of must fermented in tanks equipped and operated with an emissions control system. FER shall be calculated as follows:

$$FER = \frac{(Q \times EF)}{1,000 \text{ gal}} \times \frac{1 \text{ ton}}{2,000 \text{ lb}} \times CCCE$$

Where,

*FER* = Fermentation Emission Reduction

*Q* = Volume of must, in gallons, fermented into red wine or white wine in the controlled tank

*EF* = Emissions Factor for the type of wine being fermented in the controlled tank. EF equals 6.2 lb for red wine, and 2.5 lb for white wine

*CCCE* = Combined Capture and Control Efficiency of the VOC emissions control system

- 3.17 Fermenter: any tank used to ferment must into wine.
- 3.18 Gas Leak: a reading in excess of 1,000 ppmv, above background, measured on a portable hydrocarbon detection instrument that is calibrated with methane.
- 3.19 Gas-Tight: a condition without a gas leak.

- 3.20 Higher Heating Value (hhv): the total heat liberated per mass of fuel burned (Btu per pound), when fuel and dry air at standard conditions undergo complete combustion and all resulting products are brought to the standard states at standard conditions.
- 3.21 Must: any unfermented juice or mixture of juice, pulp, skins, and seeds prepared from grapes or other fruit. Must fermented to produce white wines is considered to be juice. Must fermented to produce red wines is considered to be a mixture of juice and solids, such as pulp, skins, and seeds.
- 3.22 Operator: includes but is not limited to any person who leases, supervises, or operates equipment, in addition to the normal meaning of ownership.
- 3.23 Potential To Emit: as defined in District Rule 2201 (New and Modified Stationary Source Review Rule).
- 3.24 Red Wine: any wine produced by a process that separates the wine from the must solids (skins, pulp, seeds) after fermentation begins.
- 3.25 Required Annual Emissions Reductions (RAER): the sum of all emission reductions rounded to the nearest 0.1 ton, achieved by the operator during the calendar year. Required Annual Emissions Reductions shall be calculated as follows:

$$RAER = \sum FER + \sum CER + \sum DOER$$

Where,

*RAER* = Required Annual Emissions Reductions

$\sum FER$  = Sum of all Fermentation Emission Reductions from controlled wine fermenters in operation at the winery during the calendar year

$\sum CER$  = Sum of all Certified Emission Reductions obtained by the operator during the calendar year

$\sum DOER$  = Sum of all District Obtained Emission Reductions achieved through payment of Air Quality Impact Mitigation Fees for the calendar year

- 3.26 Stationary Source: as defined in District Rule 2201 (New and Modified Stationary Source Review Rule).

- 3.27 Storage Tank: any container having an internal volume greater than 250 gallons, used to hold wine.
- 3.28 Surplus: emission reductions which have not been relied upon or required by any local, state, or federal permit, rule, regulation, law, ordinance, or approved air quality plan.
- 3.29 Tank: any vessel, with a volume greater than 250 gallons, used as a fermenter or as a storage tank.
- 3.30 Time Of Use: the date on which an emission reduction is received by the District in a winery's Three-year Compliance Plan pursuant to Section 6.1, or Annual Compliance Demonstration pursuant to Section 6.3.
- 3.31 Uncontrolled Fermentation Emissions (UFE): the VOC emissions that occur in a calendar year from the fermentation of must before emission mitigation or use of an emissions control system. Uncontrolled Fermentation Emissions shall be calculated as follows:

$$UFE = \frac{(Q_{red} \text{ gal/yr} \times 6.2 \text{ lb}) + (Q_{white} \text{ gal/yr} \times 2.5 \text{ lb})}{1,000 \text{ gal}} \times \frac{1 \text{ ton}}{2,000 \text{ lb}}$$

Where,

*UFE* = Uncontrolled Fermentation Emissions

*Q<sub>red</sub>* = Total gallons of must fermented to produce red wine during the calendar year

*Q<sub>white</sub>* = Total gallons of must fermented to produce white wine during the calendar year

- 3.32 US EPA: the United States Environmental Protection Agency.
- 3.33 Volatile Organic Compound (VOC): as defined in Rule 1020 (Definitions).
- 3.34 White Wine: any wine produced by a process that separates the juice from the must solids (skins, pulp, seeds) before fermentation begins.
- 3.35 Wine: the liquid product obtained from fermented must.
- 3.36 Winery: a facility used to produce and/or store wine.

3.37 Winery Premises: a property that is contiguous to or adjacent to the winery, and that is under the ownership and control of the winery operator.

#### 4.0 Exemptions

4.1 Except for recordkeeping requirements specified in Section 6.4.4, this rule shall not apply to any winery which has a BFE of less than 10 tons per year, or is limited by a District permit condition to a Potential To Emit of less than 10 tons VOC emissions from fermentation.

4.2 Section 5.2 shall not apply to storage tanks constructed primarily of concrete or wood.

#### 5.0 Requirements

##### 5.1 Fermentation Tanks

Operators of any winery shall achieve Required Annual Emissions Reductions (RAER) equal to at least 35% of the winery's Baseline Fermentation Emissions (BFE).

##### 5.2 Storage Tanks

Operators of any wine storage tank having an internal volume equal to or greater than 5,000 gallons shall comply with all of the following requirements when storing wine:

5.2.1 The tank shall be equipped and operated with a pressure-vacuum relief valve meeting all of the following requirements:

5.2.1.1 The pressure-vacuum relief valve shall operate within 10% of the maximum allowable working pressure of the tank,

5.2.1.2 The pressure-vacuum relief valve shall operate in accordance with the manufacturer's instructions, and

5.2.1.3 The pressure-vacuum relief valve shall be permanently labeled with the operating pressure settings.

5.2.1.4 The pressure-vacuum relief valve and storage tank shall remain in a gas-tight condition except when the operating pressure of the tank exceeds the valve set pressure. A gas-tight condition shall be determined by measuring the gas leak in accordance with the procedures in EPA Method 21.

5.2.2 The temperature of the stored wine shall be maintained at or below 75° Fahrenheit.

5.2.2.1 Temperature of the stored wine shall be determined and recorded at least once per week.

5.2.2.2 For each batch of wine, operators shall achieve the storage temperature of 75°F or less within 60 days after completing fermentation.

## 6.0 Administrative Requirements

### 6.1 Three-year Compliance Plan

By no later than December 1, 2006, and every three years thereafter, each winery operator subject to the requirements of Section 5.1 shall submit to the District, a Three-Year Compliance Plan that demonstrates compliance with the applicable requirements of this rule for each year of the applicable compliance period. The Three-year Compliance Plan shall include the following information:

6.1.1 Name and address of the winery.

6.1.2 Name, title, and contact information for the operator and the operator's signature certifying the accuracy of all information presented in the Three-Year Compliance Plan.

6.1.3 Calculation of the BFE, and the volumes of red wine and white wine fermented at the winery for each year of the Baseline Period. For the Three-Year Compliance Plan due December 1, 2006, the Baseline Period shall be the years 2003, 2004, and 2005.

6.1.4 Calculation of the RAER to be achieved for each year covered by the Three-year Compliance Plan. For the Three-Year Compliance Plan due pursuant to section 6.1, the compliance period shall be for the three-year period following the Plan submittal due date.

6.1.5 Demonstration of how the operator will achieve the RAER necessary to satisfy Section 5.1, using any combination of the following compliance options:

6.1.5.1 Fermentation Emission Reduction (FER): Reductions of VOC emissions from wine fermentation. For each FER

source the Three-Year Compliance Plan shall include the following information:

6.1.5.1.1 Calculation of FER for each controlled fermentation tank, identified by a Permit To Operate number. FER shall be calculated for the annual throughput of each controlled fermenter using the following:

$$FER = \frac{(Q \times EF)}{1,000 \text{ gal}} \times \frac{1 \text{ ton}}{2,000 \text{ lb}} \times CCCE$$

Where,

*FER* = Fermentation Emission Reduction

*Q* = Volume of must, in gallons, fermented into red wine or white wine in the controlled tank

*EF* = Emissions Factor for the type of wine being fermented in the controlled tank. EF equals 6.2 lb for red wine, and 2.5 lb for white wine

*CCCE* = Combined Capture and Control Efficiency of the VOC emissions control system

6.1.5.1.2 Reductions in annual emissions from wine fermentation resulting from changes in production volumes shall not be considered FER or result in CER.

6.1.5.2 Certified Emission Reductions (CER): Reductions in surplus emissions from mobile, area, or stationary sources.

6.1.5.2.1 CER shall have an emissions reduction duration equal to the approved life of the emission reduction activity, provided that the CER is continuously committed to the District within any operator's Three-year Compliance Plan and the CER is achieved consistent with the plan.

- 6.1.5.2.2 An emission reduction activity that loses CER status, for any reason, may be resubmitted to the District for re-approval. The emission reduction will be evaluated at the time of use, without consideration of previous CER status.
- 6.1.5.2.3 For each CER source the Three-Year Compliance Plan shall include the following information:
  - 6.1.5.2.3.1 Details of the CER to be controlled, including: starting date and duration of the CER; emissions reductions to be achieved per unit of activity; technical information demonstrating that the emissions reduction meets the definition of CER; and a plan for monitoring all emissions reductions.
  - 6.1.5.2.3.2 The Permit To Operate number for permitted sources of CER. The CER shall be made enforceable as one or more permit conditions that establish the emission unit's daily emissions limitation.
  - 6.1.5.2.3.3 A legally binding contract for non-permitted sources of CER. This rule is part of the San Joaquin Valley portion of the California State Implementation Plan. Each contract entered into pursuant to this rule shall be federally enforceable under Section 304 of the Federal Clean Air Act, 42 U.S.C. 7604. The CER shall be made enforceable by a legally binding contract between the operator of the winery, the operator of the emissions source, and the District. All contracts

executed to comply with the provisions of this rule shall contain adequate monitoring, recordkeeping, and reporting requirements to demonstrate that the required emissions reduction and the applicable performance standards are achieved during the Emission Reduction Duration.

6.1.5.2.3.4 If the emission source operates exclusively on the Winery Premises during the compliance period, the CER shall be offset at a ratio of 1.0 ton CER per 1.0 ton of fermentation VOC emissions.

6.1.5.2.3.5 If the emission source is not operated exclusively on the Winery Premises during the compliance period, the CER shall be offset at a ratio of 1.2 ton CER per 1.0 ton of fermentation VOC emissions.

6.1.5.3 District Obtained Emissions Reductions (DOER) obtained by payments to the District Air Quality Impact Mitigation Fund (AQIMF) for a Three-Year Compliance Plan shall include the following information:

6.1.5.3.1 The amount of requested DOER. DOER shall be calculated as follows:

$$DOER = RAER - \sum CER - \sum FER$$

Where,

*DOER* = The amount of District Obtained Emission Reductions.

*RAER* = 35% of the operator's Baseline Fermentation Emissions.

$\Sigma CER$  = Sum of all CER to be obtained by the operator.

$\Sigma FER$  = Sum of all FER to be achieved by the operator.

6.1.5.3.2 The payment amount for DOER shall be an amount sufficient to cover the District's costs of obtaining emission reductions having an Emission Reduction Duration (ERD) of three years in aggregate, plus an administrative fee.

6.1.5.3.3 Payment shall be calculated as follows:

$$AQIMF = DOER \times FR \times AF$$

Where,

$AQIMF$  = Air Quality Impact Mitigation Fund payment.

$DOER$  = District Obtained Emissions Reductions.

$FR$  = Fund Rate. As of January 1, 2006, the Fund Rate is established at \$11,778 per ton.

$AF$  = District's administrative fee. As of January 1, 2006, the administrated fee is established at 1.04.

6.1.5.3.4 Beginning January 1, 2007, the Fund Rate and the administrative fee shall be established by the APCO in accordance with Section 6.5.

6.1.5.3.5 Payment of DOER and administrative fees shall be made to the District no later than March 1, of the first year in the applicable compliance period. For the Three-Year Compliance Plan due December 1, 2006, the payment of DOER and administrative fees shall be made no later than March 1, 2007.

- 6.1.6 Emission reductions achieved in excess to RAER may not be banked or credited for use to satisfy RAER requirements in any year other than the year of their generation.
- 6.1.7 New Source Review Emission Reduction Credits are not eligible for use to satisfy RAER requirements.
- 6.1.8 For fermentation tanks subject to emission controls from New Source Review requirements, the maximum allowable FER shall be the lesser of either the actual emission reduction generated by the NSR review control, or 35% of the uncontrolled emissions.

## 6.2 Three-Year Compliance Plan Verification

By no later than July 1, 2007, and every three years thereafter, winery operators shall submit to the District a Three-Year Compliance Plan Verification that demonstrates that the Three-Year Compliance Plan elements are in effect. The Compliance Plan Verification shall include the following information:

- 6.2.1 Name and address of the winery.
- 6.2.2 Name, title, and contact information for the operator, and the operator's signature certifying the accuracy of all submitted information.
- 6.2.3 Certification that the required control equipment to generate FER are installed and operating consistent with their Permit To Operate conditions.
- 6.2.4 Certification stating that the required emissions reduction commitments to generate CER have been implemented.
- 6.2.5 Certification that AQIMF payments to obtain DOER have been made.

## 6.3 Annual Compliance Plan Demonstration

By no later than February 1, 2008, and every year thereafter, each winery operator shall submit to the District an Annual Compliance Plan Demonstration that shows compliance with the applicable requirements of this rule. The Compliance Plan Demonstration shall include the following information:

- 6.3.1 Name and address of the winery.

- 6.3.2 Name, title, and contact information for the operator, and the operator's signature certifying the accuracy of all information presented in the Three-Year Compliance Plan.
- 6.3.3 Calculation of the Uncontrolled Fermentation Emissions (UFE) for the prior calendar year.
- 6.3.4 Certification that all CER commitments were met and calculations of the resulting emission reductions.
- 6.3.5 Certification that all FER controls were installed and operated, and calculations of the resulting emission reductions.
- 6.3.6 If the UFE is less than or equal to the BFE, the operator shall demonstrate that the RAER is greater than or equal to 35% of the BFE indicated in the Three-Year Compliance Plan, for the year covered by the demonstration.
- 6.3.7 If the UFE is greater than the BFE, the operator shall demonstrate that the RAER is greater than or equal to 35% of the UFE for the year covered by the demonstration. If the RAER are less than 35% of the UFE the operator shall identify how they will obtain additional RAER sufficient to satisfy this section.
  - 6.3.7.1 Additional RAER may be obtained from any source of FER, CER or DOER.
  - 6.3.7.2 All additional RAER shall be obtained by April 1 of the year of the Annual Compliance Demonstration.

#### 6.4 Monitoring and Recordkeeping

Commencing January 1, 2007, the following records shall be maintained, retained on-site for a minimum of five years, and made available to the APCO upon request:

- 6.4.1 For each fermentation batch, operators shall record the following information by Permit To Operate number and by wine type, stated as either red wine or white wine:
  - 6.4.1.1 Total gallons of must fermented,
  - 6.4.1.2 Uncontrolled Fermentation Emissions, and

6.4.1.3 Fermentation Emission Reductions.

6.4.2 For each storage tank, operators shall record the following information on a weekly basis:

6.4.2.1 Total gallons of wine contained in the tank, and

6.4.2.2 Maximum temperature of the stored wine.

6.4.3 Operators using CER to mitigate fermentation emissions shall perform all monitoring and recordkeeping, as established in their approved Three-Year Compliance Plan, and shall maintain all records necessary to demonstrate compliance.

6.4.4 Operators claiming exemption pursuant to Section 4.0 shall maintain annual records of the total gallons of red wine and the total gallons of white wine fermented at the winery, and total gallons of wine in storage tanks. Records submitted to the United States Department of Treasury - Alcohol and Tobacco Tax and Trade Bureau for the purpose of tax determination shall be adequate, provided the operator indicates the volumes of red and white wines fermented.

6.5 Air Quality Impact Mitigation Fund Fees Review

The District shall review the AQIMF and administrative fees on an annual basis to determine their appropriateness and to establish fee levels that are not less than the District's cost to obtain emission reductions and administer the program. The APCO may adjust the cost of reductions according to the following process:

6.5.1 An analysis shall be performed that details:

6.5.1.1 The cost effectiveness of projects funded to date;

6.5.1.2 The rule effectiveness of achieving the required emission reductions to date; and

6.5.1.3 The availability of off-site emission reduction projects.

6.5.2 The APCO shall provide a draft revised cost effectiveness based on the analysis.

6.5.3 The process shall included at least one public workshop.

## 6.6 Test Methods

- 6.6.1 Operators of an emission unit identified in a District prohibitory rule shall comply with the test methods specified in the applicable District prohibitory rule.
- 6.6.2 Operators of an emission unit not identified in a District prohibitory rule shall use the following test methods to quantify emission reductions. Alternative test methods may be used provided they are approved by the APCO, ARB, and US EPA.

### 6.6.2.1 VOC Control

6.6.2.1.1 The control efficiency of any VOC destruction device, measured and calculated as carbon, shall be determined by US EPA Method 25, except when the outlet concentration must be below 50 ppm in order to meet the standard, in which case US EPA Method 25a may be used.

6.6.2.1.2 US EPA Method 18 may be used in lieu of US EPA Method 25 or US EPA Method 25A provided the identity and approximate concentrations of the analytes/compounds in the sample gas stream are known before analysis with the gas chromatograph and the gas chromatograph is calibrated for each of the known analytes/compounds to ensure that the VOC concentrations are neither under- or over-reported.

### 6.6.2.2 NO<sub>x</sub> Control

6.6.2.2.1 Fuel hhv shall be certified by a third party fuel supplier or determined by:

6.6.2.2.1.1 ASTM D 240-87 or D 2382-88 for liquid hydrocarbon fuels;

6.6.2.2.1.2 ASTM D 1826-88 or D 1945-81 in conjunction with ASTM D 3588-89 for gaseous fuels.

6.6.2.3 Oxides of nitrogen (ppmv) – US EPA Method 7E, or ARB Method 100.

- 6.6.2.4 Carbon monoxide (ppmv) – US EPA Method 10, or ARB Method 100.
- 6.6.2.5 Stack gas oxygen – US EPA Method 3 or 3A, or ARB Method 100.
- 6.6.2.6 NOx Emission Rate (Heat Input Basis) – US EPA Method 19.
- 6.6.2.7 Stack gas velocities – US EPA Method 2.
- 6.6.2.8 Stack gas moisture content – US EPA Method 4.

## 6.7 Compliance Testing

Operators of an emission unit identified in a District prohibitory rule shall comply with the compliance test methods specified in the applicable District prohibitory rule. Operators of an emission unit not identified in a District prohibitory rule shall comply with compliance test requirements approved by the APCO, ARB, and US EPA.

7.0 Compliance Schedule

Operators shall comply with the applicable requirements of this rule by the dates indicated in Table 1 Rule Compliance Schedule.

Table1 Rule Compliance Schedule

<b>Initial Compliance Date</b>	<b>Subsequent Compliance Dates</b>	<b>Requirement</b>	<b>Reference</b>
December 1, 2006	Every three years	Submit Three-year Compliance Plan to District	Section 6.1
January 1, 2007	Continuously, as appropriate	Commencing monitoring and recordkeeping	Section 6.4
March 1, 2007	Every three years	Submit AQIMF & Administrative fees for DOER pursuant to the Three-Year Compliance Plan	Section 6.1.5.3.4
July 1, 2007	Every three years	Submit Three-year Compliance Plan Verification	Section 6.2
March 1, 2008	Annually	Submit Annual Compliance Plan Demonstration	Section 6.3
May 1, 2008	Annually, as appropriate	Provide additional RAER, as required	Section 6.3.5.2

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