San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

NOV 15 2017

Mr. Ted Wells
Sutter Home winery
18667 N Jacob Brack Rd
Lodi, CA 95242

Re: Proposed ATC / Certificate of Conformity (Significant Mod)
District Facility # N-7855
Project # N-1171486

Dear Mr. Wells:

Enclosed for your review is the District's analysis of an application for Authority to Construct for the facility identified above. You requested that a Certificate of Conformity with the procedural requirements of 40 CFR Part 70 be issued with this project. This project is to modify 160 wine tanks to allow spirits with up to 60% ethanol by volume to be stored in the tanks.

After addressing all comments made during the 30-day public notice and the 45-day EPA comment periods, the District intends to issue the Authority to Construct with a Certificate of Conformity. Please submit your comments within the 30-day public comment period, as specified in the enclosed public notice. Prior to operating with modifications authorized by the Authority to Construct, the facility must submit an application to modify the Title V permit as an administrative amendment, in accordance with District Rule 2520, Section 11.5.

If you have any questions, please contact Mr. Nick Peirce, Permit Services Manager, at (209) 557-6400.

Thank you for your cooperation in this matter.

Sincerely,

Arnaud Marjollet
Director of Permit Services

Enclosures

cc: Tung Le, CARB (w/enclosure) via email
cc: Gerardo C. Rios, EPA (w/enclosure) via email

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San Joaquin Valley Air Pollution Control District

Authority to Construct Application Review

Modification of Wine Fermentation/Storage Tanks to Allow the Storage of Spirits

Facility Name:	Sutter Home Winery	Date:	October 26, 2017
Mailing Address:	18667 N Jacob Brack Rd Lodi, CA 95242	Engineer:	James Harader
		Lead Engineer:	Nick Peirce
Contact Person:	Ted Wells		
Telephone:	(209) 263-3228		
E-Mail:	twells@tfewines.com		
Application #(s):	N-7855-449-2 through '508-2, and N-7855-631-2 through '700-2, and N-7855-751-2 through '776-2		
Project #:	N-1171486		
Deemed Complete:	June 29, 2017		

I. Proposal

Sutter Home Winery is requesting Authority to Construct permits for the modification of 160 white wine fermentation and storage tanks to allow the storage of distilled spirits in these tanks. To allow spirits to be stored in the tank, the applicant is proposing to increase the ethanol content limit from 23.9 percent by volume to 60 percent by volume. No changes are proposed to the tanks when operating as white wine fermenters. This project only affects storage operations in the tanks. A copy of the current PTO's is included in Appendix II.

Sutter Home Winery currently has a specific limiting condition (SLC) of 292,950 pounds of volatile organic compound (VOC) emissions per year for the fermentation and storage operations located at this facility. Sutter Home Winery is not proposing to increase the SLC limit for VOC emissions.

Sutter Home Winery operates under a Title V permit. This modification can be classified as a Title V significant modification pursuant to Rule 2520, and can be processed with a Certificate of Conformity (COC). Since the facility has specifically requested that this project be processed in that manner, the 45-day EPA comment period will be satisfied prior to the issuance of the Authority to Construct. Sutter Home Winery must apply to administratively amend their Title V permit.

II. Applicable Rules

Rule 2201 New and Modified Stationary Source Review Rule (2/18/16)
Rule 2410 Prevention of Significant Deterioration (6/16/11)
Rule 2520 Federally Mandated Operating Permits (6/21/01)
Rule 4001 New Source Performance Standards (4/14/99)
Rule 4002 National Emissions Standards for Hazardous Air Pollutants (5/20/04)
Rule 4102 Nuisance (12/17/92)
Rule 4694 Wine Fermentation and Storage Tanks (12/15/05)
California Health & Safety Code 41700 (Public Nuisance)
California Health & Safety Code 42301.6 (School Notice)
Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

III. Project Location

The facility is located at 18667 N Jacob Brack Rd in Lodi, CA. The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

IV. Process Description

Sutter Home Winery operates a wine fermentation and storage facility.

This project will allow the facility to receive and store spirits in up to 160 existing tanks at the facility. Spirits will be received via truck and delivered to the tanks. The spirits will then be used as additives for various wine products at the facility. The spirits will have an ethanol content up to 60% by weight. The applicant is not proposing any changes that would affect fermentation operations when the tanks are used to ferment white wine.

V. Equipment Listing

The applicant is proposing to modify 160 tanks to allow the tanks to store distilled spirits. All of the tanks are equipped with pressure/vacuum valves and tank insulation. Please refer to the Draft Authority to Construct in Appendix I for a sample tank equipment description.

VI. Emission Control Technology Evaluation

VOCs, primarily ethanol, are emitted from the tanks as a result of both working losses (which occur when the liquid level in the tank changes) and breathing losses (expansion and contraction effects due to temperature variations). The proposed pressure/vacuum relief valve limits emissions of VOC's due to the breathing and working losses. Additionally, when wine or spirits storage tanks are insulated or located in a climate controlled building, breathing losses are considered negligible.

VII. General Calculations

A. Assumptions

- VOC is the only criteria pollutant emitted by the tanks.
- No change is proposed to the fermentation operation that takes place in these tanks.
- The fill-factor for white wine fermentation is 95%. (District Practice)
- The typical white wine grape crushing season is 120 days. (District Practice)
- A white wine fermentation cycle takes approximately 10 days. (District Practice)
- The pre-project maximum ethanol content of stored wine is limited to 23.9% by volume.
- The post-project maximum ethanol content of stored wine or spirits will be 60% by volume.
- The maximum daily throughput of each of the storage tanks is 5 turns per day. A 100% fill factor is assumed for wine storage. (per District practice)
- The maximum annual throughput of each of the storage tanks is estimated to be 25 turns per year. A 100% fill factor is assumed for wine storage.
- There will be no change to the existing SLC of 292,950 lb-VOC/year for wine fermentation and storage tanks.
- Other assumptions will be stated as they are made.

B. Emission Factors

1. Pre-Project Emission Factors (EF1)

The following emission factors are applicable for these red and white wine tanks. These are based on the emission factors listed in District FYI-114, "VOC Emission Factors for Wine Fermentation and Storage Tanks (Revised 8/10/11, included in Appendix III)" and based on a maximum ethanol content of 23.9% (rounded to 24%) by volume.

Type	Operation	EF1 (lb-VOC/1,000 gal of wine)		Source
		Daily	Annual	
White	Fermentation	1.62	2.5	District FYI-114 (See Appendix III)
White	Storage	0.366	0.213	District FYI -114 (See Appendix III)

2. Post-Project Emission Factors (EF2)

The following emission factors are applicable for these red and white wine tanks. These are based on the emission factors listed in District FYI-114, "VOC Emission Factors for Wine Fermentation and Storage Tanks (Revised 8/10/11, included in Appendix II)" and based on a maximum ethanol content of 60% by volume (proposed by applicant).

Type	Operation	EF2 (lb-VOC/1,000 gal of wine)		Source
		Daily	Annual	
White	Fermentation	1.62	2.5	District FYI-114 (See Appendix III)
White or Spirits	Storage	0.684	0.413	District FYI -114 (See Appendix III)

C. Calculations

1. Pre-Project Potential to Emit (PE1)

Fermentation

Although no changes are proposed to the white wine fermentation operations in these tanks, annual fermentation emissions from these tanks will be calculated for future reference.

The following formula will be used to calculate the worst-case potential to emit for fermentation in the 160 tanks:

$$\text{Annual VOC}_{\text{Ferment}} = \text{Tank Capacity (gal)} \times \text{Fill Factor} \times \text{Fermentation Season (days)} \div \text{Fermentation Cycle (days)} \times 2.5 \text{ lb-VOC/1000 gallon}$$

Permit Unit	# of Tanks	Capacity (gallons,per tank)	Fill Factor	Ferment Season (days)	Ferment Cycle (days)	PE1 VOC (lb/year, per tank)	PE1 VOC (lb/year, combined)
N-7855-449-1 through '-508-1	60	25,885	0.95	120	10	738	44,280
N-7855-631-1 through '-650-1	20	2,600	0.95	120	10	74	1,480
N-7855-651-1 through '-670-1	20	5,282	0.95	120	10	151	3,020
N-7855-671-1 through '-688-1, And '-699-1 through '-700-1	20	10,587	0.95	120	10	302	6,040
N-7855-689-1 through '-698-1	10	15,500	0.95	120	10	442	4,420
N-7855-747-1 through '-751-1 and '-772-1 through 776-1	10	20,219	0.95	120	10	576	5,760
N-7855-752-1 through '-756-1 and '-767-1 through 771-1	10	13,487	0.95	120	10	384	3,840
N-7855-757-1 through '-766-1	10	8,031	0.95	120	10	229	2,290
						Total	**71,130**

Storage

Maximum pre-project daily emissions from the storage of white or red wine is equal to the following:

$$\text{Daily VOC}_{\text{Storage}} = \text{Tank Capacity (gal)} \times 5 \text{ turnovers/day} \times \text{EF1}_{\text{Storage, Daily}} \text{ (lb-VOC/1000 gal)}$$

Annual pre-project VOC emissions from the storage of white or red wine is equal to the following:

$$\text{Annual VOC}_{\text{Storage}} = \text{Tank Capacity (gal)} \times 25 \text{ turnovers/year} \times \text{EF1}_{\text{Storage, Annual}} \text{ (lb-VOC/1000 gal)}$$

Permit Unit	# of Tanks	Capacity (gallons,per tank)	PE1 VOC (lb/day, per tank)	PE1 VOC (lb/year, per tank)	PE1 VOC (lb/year, combined)
N-7855-449-1 through '-508-1	60	25,885	47.4	138	8,280
N-7855-631-1 through '-650-1	20	2,600	4.8	14	280
N-7855-651-1 through '-670-1	20	5,282	9.7	28	560
N-7855-671-1 through '-688-1, And '-699-1 through '-700-1	20	10,587	19.4	56	1,120
N-7855-689-1 through '-698-1	10	15,500	28.4	83	830
N-7855-747-1 through '-751-1 and '-772-1 through 776-1	10	20,219	37.0	108	1,080
N-7855-752-1 through '-756-1 and '-767-1 through 771-1	10	13,487	24.7	72	720
N-7855-757-1 through '-766-1	10	8,031	14.7	43	430
				Total	**13,300**

2. Post Project Potential to Emit (PE2)

Fermentation

The applicant is not proposing any changes that would affect the fermentation operation in these tanks. Thus, PE2 is equal to PE1 for fermentation.

Storage

Maximum daily emissions from the storage of wine or spirits is equal to the following:

$$\text{Daily VOC}_{\text{Storage}} = \text{Tank Capacity (gal)} \times 5 \text{ turnovers/day} \times \text{EF2}_{\text{Storage, Daily}} \text{ (lb-VOC/1000 gal)}$$

Annual VOC emissions from the storage of wine or spirits is equal to the following:

$$\text{Annual VOC}_{\text{Storage}} = \text{Tank Capacity (gal)} \times 25 \text{ turnovers/year} \times \text{EF2}_{\text{Storage, Annual}} \text{ (lb-VOC/1000 gal)}$$

Permit Unit	# of Tanks	Capacity (gallons,per tank)	PE2 VOC (lb/day, per tank)	PE2 VOC (lb/year, per tank)	PE2 VOC (lb/year, combined)
N-7855-449-1 through '-508-1	60	25,885	88.5	267	16,020
N-7855-631-1 through '-650-1	20	2,600	8.9	27	540
N-7855-651-1 through '-670-1	20	5,282	18.1	55	1,100
N-7855-671-1 through '-688-1, And '-699-1 through '-700-1	20	10,587	36.2	109	2,180
N-7855-689-1 through '-698-1	10	15,500	53.0	160	1,600
N-7855-747-1 through '-751-1 and '-772-1 through 776-1	10	20,219	69.1	209	2,090
N-7855-752-1 through '-756-1 and '-767-1 through 771-1	10	13,487	46.1	139	1,390
N-7855-757-1 through '-766-1	10	8,031	27.5	83	830
				Total	**25,750**

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Pursuant to District Rule 2201, the SSPE1 is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of Emission Reduction Credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions (AER) that have occurred at the source, and which have not been used on-site.

The following data was obtained from District Project N1141458.

SSPE1 (lb/yr)					
Permit	**NO_x**	**SO_x**	**PM_{10}**	**CO**	**VOC**
N-7855-226 thru -852 and -855 thru -898 (Wine tank permits)	0	0	0	0	292,950 (SLC)
N-7855-853-1	46	0	3	23	2
N-7855-854-3	0	0	73	0	0
N-7855-899-0	182	0	4	27	7
N-7855-900-0	68	0	2	24	2
ERC	0	0	0	0	0
Total	**296**	**0**	**82**	**74**	**292,961**

4. Post Project Stationary Source Potential to Emit (SSPE2)

Pursuant to District Rule 2201, the SSPE2 is the PE from all units with valid ATCs or PTOs at the Stationary Source and the quantity of ERCs which have been banked since September 19, 1991 for AER that have occurred at the source, and which have not been used on-site.

The facility is not proposing any changes to the existing SLC. Therefore, SSPE2 is equal to SSPE1.

SSPE2 (lb/yr)					
Permit	**NO_x**	**SO_x**	**PM_{10}**	**CO**	**VOC**
N-7855-226 thru -852 and -855 thru -898 (Wine tank permits)	0	0	0	0	292,950 (SLC)
N-7855-853-1	46	0	3	23	2
N-7855-854-3	0	0	73	0	0
N-7855-899-0	182	0	4	27	7
N-7855-900-0	68	0	2	24	2
ERC	0	0	0	0	0
Total	**296**	**0**	**82**	**74**	**292,961**

5. Major Source Determination

Rule 2201 Major Source Determination:

Pursuant to District Rule 2201, a Major Source is a stationary source with a SSPE2 equal to or exceeding one or more of the following threshold values. For the purposes of determining major source status, the following shall not be included:

- any ERCs associated with the stationary source
- Emissions from non-road IC engines (i.e. IC engines at a particular site at the facility for less than 12 months)
- Fugitive emissions, except for the specific source categories specified in 40 CFR 51.165

Rule 2201 Major Source Determination (lb/year)						
	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO	VOC
SSPE1	296	0	82	82	74	292,961
SSPE2	296	0	82	82	74	292,961
Major Source Threshold	20,000	140,000	140,000	140,000	200,000	20,000
Major Source?	No	No	No	No	No	No

Note: PM2.5 assumed to be equal to PM10

This source is an existing Major Source for VOC emissions and will remain a Major Source for VOC. No change in other pollutants are proposed or expected as a result of this project.

Rule 2410 Major Source Determination:

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(iii). Therefore, the PSD Major Source threshold is 250 tpy for any regulated NSR pollutant.

PSD Major Source Determination (tons/year)						
	NO2	VOC	SO2	CO	PM	PM10
Estimated Facility PE before Project Increase	0.1	146.5	0.0	0.04	0.04	0.04
PSD Major Source Thresholds	250	250	250	250	250	250
PSD Major Source ? (Y/N)	N	N	N	N	N	N

As shown above, the facility is not an existing PSD major source for any regulated NSR pollutant expected to be emitted at this facility.

6. Baseline Emissions (BE)

The BE calculation (in lb/year) is performed pollutant-by-pollutant for each unit within the project to calculate the QNEC, and if applicable, to determine the amount of offsets required.

Pursuant to District Rule 2201, BE = PE1 for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to District Rule 2201.

Clean Unit Determination for Existing Tanks under SLC

This facility is a major source for VOC emissions. A unit is considered clean if that unit is equipped with an emission control technology that meets the requirements for achieved-in-practice BACT as accepted by the APCO during the five years immediately prior to the submission of the complete application. For a facility with a specific limiting condition (SLC), all units in the SLC must be clean in order for emission units under the SLC to be considered clean.

This facility has an SLC for its wine fermentation and storage tanks. Thus, all wine fermentation tanks and storage tanks must be clean. Achieved in Practice BACT five years immediately prior to submission of the application was:

Operation	Achieved in Practice BACT (5 years prior)
Wine Fermentation	BACT Guideline 5.4.14 Temperature-controlled open top tank with maximum average fermentation temperature of 95 deg F
Wine Storage	BACT Guideline 5.4.13 Insulation or Equivalent, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum allowable working pressure of the tank, "gas-tight" tank operation; and continuous storage temperature not exceeding 75 degrees F, achieved within 60 days of completion of fermentation

All of the existing wine tanks are operated to meet the above BACT limits; therefore, all of the tanks in the SLC are clean emission units.

$BE_{SLC} = PE1_{SLC}$

7. SB 288 Major Modification

SB 288 Major Modification is defined in 40 CFR Part 51.165 as "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act."

Since this facility is a major source for VOC, the project's PE2 is compared to the SB 288 Major Modification Thresholds in the following table in order to determine if the SB 288 Major Modification calculation is required.

Since this project only involves the storage operations in the tanks, only the storage emissions are included in the Project PE2 below.

SB 288 Major Modification Thresholds			
Pollutant	**Project PE2 (lb/year)**	**Threshold (lb/year)**	**SB 288 Major Modification Calculation Required?**
VOC	25,750	50,000	No

Since none of the SB 288 Major Modification Thresholds is surpassed with this project, this project does not constitute an SB 288 Major Modification.

8. Federal Major Modification

District Rule 2201 states that a Federal Major Modification is the same as a "Major Modification" as defined in 40 CFR 51.165 and part D of Title I of the CAA.

The determination of Federal Major Modification is based on a two-step test. For the first step, only the emission *increases* are counted. Emission decreases may not cancel out the increases for this determination.

For existing emissions units, the increase in emissions is calculated as follows.

Emission Increase = PAE – BAE - UBC

Where: PAE = Projected Actual Emissions, and
BAE = Baseline Actual Emissions
UBC = Unused baseline capacity

Only VOC is emitted by the tanks. The applicant's proposal will result in an increase in storage emissions, compared to the baseline. Thus, the emission increase will be greater than zero for this project and the project triggers a Federal Major Modification for VOC emissions for the wine and spirits storage operation.

Federal Offset quantities are calculated below:

Federal Offset Quantities:

The Federal offset quantity is only calculated only for the pollutants for which the project is a Federal Major Modification. The Federal offset quantity is the sum of the annual emission changes for all new and modified emission units in a project calculated as the potential to emit after the modification (PE2) minus the actual emissions (AE) during the baseline period for each emission unit times the applicable federal offset ratio. There are no special calculations performed for units covered by an SLC.

VOC		Federal Offset Ratio	1.5
Permit No.	**Actual Emissions (lb/year)**	**Potential Emissions (lb/year)**	**Emissions Change (lb/yr)**
N-7855 160 wine tanks Storage Operation Only	**1,729[1]**	**25,750**	**24,021**
		Net Emission Change (lb/year):	**24,021**
		Federal Offset Quantity: (NEC * 1.5)	**36,032**

9. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination

Rule 2410 applies to any pollutant regulated under the Clean Air Act, except those for which the District has been classified nonattainment. The pollutants which must be addressed in the PSD applicability determination for sources located in the SJV and which are emitted in this project are: (See 52.21 (b) (23) definition of significant)

- VOC

I. Project Emissions Increase - New Major Source Determination

The post-project potentials to emit from all new and modified units are compared to the PSD major source thresholds to determine if the project constitutes a new major source subject to PSD requirements.

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(i). The PSD Major Source threshold is 250 tpy for any regulated NSR pollutant.

PSD Major Source Determination: Potential to Emit (tons/year)						
	NO_2	**VOC**	**SO_2**	**CO**	**PM**	**PM_{10}**
Total PE from New and Modified Units	0.0	12.9	0.0	0.0	0.0	0.0
PSD Major Source threshold	250	250	250	250	250	250
New PSD Major Source?	N	N	N	N	N	N

As shown in the table above, the potential to emit for the project, by itself, does not exceed any PSD major source threshold. Therefore Rule 2410 is not applicable and no further analysis is required.

[1] Based on 2-year average of actual emissions from the 160 tanks during the baseline period.

10. Quarterly Net Emissions Change (QNEC)

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS emissions profile screen. Detailed QNEC calculations are included in Appendix V.

VIII. Compliance Determination

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis. Unless specifically exempted by Rule 2201, BACT shall be required for the following actions*:

a. Any new emissions unit with a potential to emit exceeding two pounds per day,
b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding two pounds per day, and/or
d. Any new or modified emissions unit, in a stationary source project, which results in an SB 288 Major Modification or a Federal Major Modification, as defined by the rule.

*Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

a. New emissions units – PE > 2 lb/day

As discussed in Section I above, there are no new emissions units associated with this project. Therefore, BACT for new units with PE > 2 lb/day purposes is not triggered.

b. Relocation of emissions units – PE > 2 lb/day

As discussed in Section I above, there are no emissions units being relocated from one stationary source to another; therefore, BACT is not triggered.

c. Modification of emissions units – AIPE > 2 lb/day

AIPE = PE2 – HAPE

Where,

AIPE = Adjusted Increase in Permitted Emissions, (lb/day)
PE2 = Post-Project Potential to Emit, (lb/day)
HAPE = Historically Adjusted Potential to Emit, (lb/day)

HAPE = PE1 x (EF2/EF1)

Where,

PE1 = The emissions unit's PE prior to modification or relocation, (lb/day)
EF2 = The emissions unit's permitted emission factor for the pollutant after modification or relocation. If EF2 is greater than EF1 then EF2/EF1 shall be set to 1
EF1 = The emissions unit's permitted emission factor for the pollutant before the modification or relocation

AIPE = PE2 – (PE1 * (EF2 / EF1))

Wine Fermentation

Since PE2 is equal to PE1 and EF2 is equal to EF1, the AIPE is equal to zero for the fermentation operation in these tanks.

Wine Storage

For this project, EF2 is greater than EF1; therefore, EF2/EF1 is equal to 1, and,

AIPE = PE2 – PE1

Permit Unit	PE2 VOC (lb/day, per tank)	PE1 VOC (lb/day, per tank)	AIPE VOC (lb/day)	BACT Triggered?
N-7855-449-1 through '-508-1	88.5	47.4	41.1	Yes
N-7855-631-1 through '-650-1	8.9	4.8	4.1	Yes
N-7855-651-1 through '-670-1	18.1	9.7	8.4	Yes
N-7855-671-1 through '-688-1, And '-699-1 through '-700-1	36.2	19.4	16.8	Yes
N-7855-689-1 through '-698-1	53.0	28.4	24.6	Yes
N-7855-747-1 through '-751-1 and '-772-1 through 776-1	69.1	37.0	32.1	Yes
N-7855-752-1 through '-756-1 and '-767-1 through 771-1	46.1	24.7	21.4	Yes
N-7855-757-1 through '-766-1	27.5	14.7	12.8	Yes

As demonstrated above, the AIPE is greater than 2.0 lb/day for VOC emissions from the storage tanks; therefore, BACT is triggered for VOC for the wine and spirits storage operation.

d. SB 288/Federal Major Modification

As discussed in Sections VII.C.7 and VII.C.8 above, this project does constitute a Federal Major Modification for VOC emissions for the wine and spirits storage operation only. Therefore, BACT is triggered for VOC emissions for the wine and spirits storage operation.

2. BACT Guideline

BACT Guideline 5.4.13 is applicable to the storage of wine and BACT Guideline 5.4.15 is applicable to the storage of distilled spirits. (See **Appendix III**)

3. Top-Down BACT Analysis

Per Permit Services Policies and Procedures for BACT, a Top-Down BACT analysis shall be performed as a part of the application review for each application subject to the BACT requirements pursuant to the District's NSR Rule.

Pursuant to the "Top-Down BACT Analysis" in Appendix III of this document, BACT has been satisfied with the following:

For Wine and Distilled Spirits

Insulation or Equivalent, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum allowable working pressure of the tank; "gas-tight" tank operation.

For Wine Only

A continuous storage temperature not exceeding 75 degrees F, achieved within 60 days of completion of fermentation.

The following conditions will be included on the Authority to Construct permits:

- *When used for wine or spirit storage, this tank shall be equipped with and operated with a pressure-vacuum relief valve, which shall operate within 10% of the maximum allowable working pressure of the tank, operate in accordance with the manufacturer's instructions, and be permanently labeled with the operating pressure settings. [District Rules 2201 and 4694]*

- *When this tank is used for wine or spirit storage, 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. [District Rules 2201 and 4694]*

- *The temperature of the wine stored in this tank shall be maintained at or below 75 degrees Fahrenheit. The temperature of the stored wine shall be determined and recorded at least once per week. For each batch of wine stored in this tank, the operator shall achieve the storage temperature of 75 degrees Fahrenheit or less within 60 days after completing fermentation, and shall maintain records to show when the required storage temperature of 75 degrees Fahrenheit or less was achieved. [District Rules 2201 and 4694]*

B. Offsets

1. Offset Applicability

Offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the SSPE2 equals or exceeds the offset threshold levels in Table 4-1 of Rule 2201.

The SSPE2 is compared to the offset thresholds in the following table.

Offset Determination (lb/year)					
	NO_X	SO_X	PM_{10}	CO	VOC
SSPE2	296	0	82	74	292,961
Offset Thresholds	20,000	54,750	29,200	200,000	20,000
Offsets triggered?	No	No	No	No	**Yes**

2. Quantity of Offsets Required

This facility's total VOCs are above the offset threshold of 20,000 pounds per year. Therefore, offset calculations are required for this project.

Section 4.7.1 states that for pollutants with SSPE1 greater than the emission offset threshold levels, emission offsets shall be provided for all increases in Stationary Source emissions, calculated as the differences of post-project Potential to Emit (PE2) and the Baseline Emissions (BE) of all new and modified emissions units, plus all increases in Cargo Carrier emissions. Thus,

$EOQ = \Sigma (PE2 - BE) + ICCE$, where

PE2 = Post-Project Potential to Emit (lb/yr)
BE = Baseline Emissions (lb/yr)
ICCE = Increase in Cargo Carrier emissions (lb/yr)

There is no increase in Cargo Carrier emissions from this project. Additionally, this facility is subject to an SLC for VOC emissions. Thus,

$EOQ = \Sigma (PE2_{SLC} - BE_{SLC})$

As discussed earlier in this evaluation BE_{SLC} is set equal to $PE1_{SLC}$ for this facility.

$EOQ = \Sigma (PE2_{SLC} - PE1_{SLC})$

Both pre-project and post-project VOC emissions from the facility's fermentation and storage operations are limited to 292,950 pounds per year. Therefore,

$EOQ = PE2_{SLC} - PE1_{SLC}$
$= 292,950$ lb-VOC/yr $- 292,950$ lb-VOC/yr
$= 0$ lb-VOC/yr

Therefore, the quantity of offsets required for this project is equal to zero.

C. Public Notification

1. Applicability

Public noticing is required for:
a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications,
b. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
c. Any project which results in the offset thresholds being surpassed,
d. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant, and/or
e. Any project which results in a Title V significant permit modification

a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications

New Major Sources are new facilities, which are also Major Sources. As shown in Section VII.C.5 above, the SSPE2 is not greater than the Major Source threshold for any pollutant. Therefore, public noticing is not required for this project for new Major Source purposes.

New Major Sources are new facilities, which are also Major Sources. Since this is not a new facility, public noticing is not required for this project for New Major Source purposes.

As demonstrated in Sections VII.C.7 and VII.C.8, this project is a Federal Major Modification. Therefore, public noticing for Federal Major Modification purposes is required.

b. PE > 100 lb/day

Applications which include a new emissions unit with a PE greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements. There are no new emissions units associated with this project. Therefore, public noticing is not required for this project for PE > 100 lb/day.

c. Offset Threshold

The SSPE1 and SSPE2 are compared to the offset thresholds in the following table.

Offset Thresholds				
Pollutant	**SSPE1 (lb/year)**	**SSPE2 (lb/year)**	**Offset Threshold**	**Public Notice Required?**
NO_X	296	296	20,000 lb/year	No
SO_X	0	0	54,750 lb/year	No
PM_{10}	82	82	29,200 lb/year	No
CO	74	74	200,000 lb/year	No
VOC	292,961	292,961	20,000 lb/year	No

VOC emissions from the facility are already above the offset threshold and are not increasing. As detailed above, there were no thresholds surpassed with this project; therefore, public noticing is not required for offset purposes.

d. SSIPE > 20,000 lb/year

Public notification is required for any permitting action that results in a SSIPE of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE = SSPE2 – SSPE1. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table.

SSIPE Public Notice Thresholds					
Pollutant	**SSPE2 (lb/year)**	**SSPE1 (lb/year)**	**SSIPE (lb/year)**	**SSIPE Public Notice Threshold**	**Public Notice Required?**
NO_X	296	296	0	20,000 lb/year	No
SO_X	0	0	0	20,000 lb/year	No
PM_{10}	82	82	0	20,000 lb/year	No
CO	74	74	0	20,000 lb/year	No
VOC	292,961	292,961	0	20,000 lb/year	No

As demonstrated above, the SSIPEs for all pollutants were less than 20,000 lb/year; therefore, public noticing for SSIPE purposes is not required.

e. Title V Significant Permit Modification

As shown in the Discussion of Rule 2520 below, this project constitutes a Title V significant modification. Therefore, public noticing for Title V significant modifications is required for this project.

2. Public Notice Action

As discussed above, public noticing is required for this project since the project triggers a Federal Major Modification and a Title V Significant Modification. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and US EPA and a public notice will be published in a local newspaper of general circulation prior to the issuance of the ATC for this equipment.

D. Daily Emission Limits (DELs)

DELs and other enforceable conditions are required by Rule 2201 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. The DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

Proposed Rule 2201 (DEL) Conditions:

The following conditions will be included on each Authority to Construct permit:

- *The VOC emissions rate for fermentation operations in this tank shall not exceed 1.62 lb/day per 1000 gallons of tank capacity. [District Rule 2201]*
- *The ethanol content of wine or spirit stored in this tank shall not exceed 60.0 percent by volume. [District Rule 2201]*
- *When this tank is used for wine or spirit storage, the daily tank throughput, in gallons, shall not exceed five times the maximum nominal tank capacity stated in the equipment description and the annual tank throughput, in gallons, shall not exceed 25 times the maximum nominal tank capacity stated in the equipment description. [District Rule 2201]*
- *Annual emissions from all wine fermentation and wine or spirits storage tanks, calculated on a 12-month rolling basis, shall not exceed 292,950 lb-VOC. [District Rule 2201]*

E. Compliance Assurance

1. Source Testing

Since winery tank emissions are based on generally accepted emission factors, source testing is not required to demonstrate compliance.

2. Monitoring

Monitoring is not required to demonstrate compliance with Rule 2201 requirements.

3. Recordkeeping

For each storage tank, the facility will be required to keep daily throughput records, including records of filling and emptying operations, the dates of such operations, a unique identifier for each batch, the volume percent ethanol in the batch, and the volume of wine transferred, is required to be maintained along with records of the total gallons of wine contained in a tank and the maximum temperature of the stored wine. These records are required to be retained on-site for a period of at least five years and made available for District inspection upon request.

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

F. Ambient Air Quality Analysis (AAQA)

An AAQA shall be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard. Since this facility only emits VOCs and since there is no ambient air quality standard for VOCs, an AAQA is not required.

G. Compliance Certification

Section 4.15.2 of this Rule requires the owner of a new Major Source or a source undergoing a Federal Major Modification to demonstrate to the satisfaction of the District that all other Major Sources owned by such person and operating in California are in compliance or are on a schedule for compliance with all applicable emission limitations and standards. As discussed in Section VIII above, this facility is a new major source and this project does constitute a Federal Major Modification, therefore this requirement is applicable. Sutter Home Winery's compliance certification is included in Appendix VI.

H. Alternate Siting Analysis

The current project occurs at an existing facility. The applicant is proposing to modify existing wine storage operations to allow the storage of distilled spirits in 160 tanks.

Use of the existing site will result in the least possible impact from the project. Alternative sites would involve the relocation and/or construction of various support structures on a much greater scale, and would therefore result in a much greater impact.

Rule 2410 Prevention of Significant Deterioration

As shown in Section VII.C.9 above, this project does not result in a new PSD major source or PSD major modification. No further discussion is required.

Rule 2520 Federally Mandated Operating Permits

This facility is subject to this Rule, and has received their Title V Operating Permit. A significant permit modification is defined as a "permit amendment that does not qualify as a minor permit modification or administrative amendment." Since this project triggers a Federal Major Modification, the project does not qualify as a minor permit modification or administrative amendment. Therefore, the project is a Significant TV permit modification.

As discussed above, the facility has applied for a Certificate of Conformity (COC); therefore, the facility must apply to modify their Title V permit with an administrative amendment, prior to operating with the proposed modifications. Continued compliance with this rule is expected. The facility shall not implement the changes requested until the final permit is issued.

Rule 4001 New Source Performance Standards (NSPS)

This rule incorporates NSPS from Part 60, Chapter 1, Title 40, Code of Federal Regulations (CFR); and applies to all new sources of air pollution and modifications of existing sources of air pollution listed in 40 CFR Part 60. However, no subparts of 40 CFR Part 60 apply to wine fermentation tanks and wine or distilled spirits storage tanks.

Rule 4002 National Emission Standards for Hazardous Air Pollutants (NESHAPs)

This rule incorporates NESHAPs from Part 61, Chapter I, Subchapter C, Title 40, CFR and the NESHAPs from Part 63, Chapter I, Subchapter C, Title 40, CFR; and applies to all sources of hazardous air pollution listed in 40 CFR Part 61 or 40 CFR Part 63. However, no subparts of 40 CFR Part 61 or 40 CFR Part 63 apply to wine fermentation tanks and wine or distilled spirits storage tanks.

Rule 4102 Nuisance

Section 4.0 prohibits discharge of air contaminants, which could cause injury, detriment, nuisance or annoyance to the public. The following condition will be placed on each permit:

- *No air contaminant shall be released into the atmosphere, which causes a public nuisance. [District Rule 4102]*

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 - Risk Management Policy for Permitting New and Modified Sources specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

Ethanol (VOC) and CO_2 are not hazardous air pollutants (HAP) as defined in Section 44321 of the California Health and Safety Code. Therefore, health risk assessment is not required.

Compliance is expected with this Rule.

Rule 4694 Wine Fermentation and Storage Tanks

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. This rule is applicable to all facilities with fermentation emissions in excess of 10 tons-VOC/year. The storage tank provisions of Section 5.2 of this rule apply only to tanks with capacity in excess of 5,000 gallons and that are not constructed out of concrete or wood.

Section 5.1 requires the winery operator achieve Required Annual Emissions Reductions (RAER) equal to at least 35% of the winery's Baseline Fermentation Emissions (BFE). Per the definition of RAER in Section 3.25 of the Rule, the RAER may be achieved by any combination of Fermentation Emission Reductions (FER), Certified Emission Reductions (CER) or District Obtained Emission Reductions (DOER) as established in the facility's District-approved Rule 4694 Compliance Plan, due every three years on December 1 beginning in 2006. The facility has submitted the required plan to the District and is currently satisfying the required emission reductions in the form of Certified Emission Reductions.

Section 5.2 places specific restrictions on wine storage tanks with 5,000 gallons or more in capacity when such tanks are not constructed of wood or concrete. Section 5.2.1 requires these tanks to be equipped and operated with a pressure-vacuum relief valve meeting all of the following requirements:

- The pressure-vacuum relief valve shall operate within 10% of the maximum allowable working pressure of the tank,
- The pressure-vacuum relief valve shall operate in accordance with the manufacturer's instructions, and
- The pressure-vacuum relief valve shall be permanently labeled with the operating pressure settings.
- 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.

All of the proposed tanks are larger than 5,000 gallons and constructed out of stainless steel. Thus, the following conditions will be included on each Authority to Construct permit:

- *When used for wine or spirits storage, this tank shall be equipped with and operated with a pressure-vacuum relief valve, which shall operate within 10% of the maximum allowable working pressure of the tank, operate in accordance with the manufacturer's instructions, and be permanently labeled with the operating pressure settings. [District Rules 2201 and 4694]*

- *When this tank is used for wine or spirits storage, 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 [District Rules 2201 and 4694]*

Section 5.2.2 requires that the temperature of the stored wine be maintained at or below 75° F. The following condition will be included on each Authority to Construct permit:

- *The temperature of the wine stored in this tank shall be maintained at or below 75 degrees Fahrenheit. For each batch of wine, the operator shall achieve the storage temperature of 75 degrees Fahrenheit or less within 60 days after completing fermentation, and shall maintain records to show when the required storage temperature of 75 degrees Fahrenheit or less was achieved. [District Rules 2201 and 4694]*

Section 6.1 and 6.2 require the facility to submit a Three-Year Compliance Plan and a Three-Year Compliance Plan Verification respectively. The three year compliance plan and plan verification is to show compliance with requirements for wine fermentation tanks. This project does not include wine fermentation tanks; therefore, the requirements of Section 6.1 and 6.2 are not applicable to this project.

Section 6.4.1 requires that records be kept for each fermentation batch. These tanks do not include fermentation; therefore, Section 6.4.1 is not applicable to these tanks.

Section 6.4.2 requires that weekly records be kept of wine volume and temperature in each storage tank. Therefore, the following conditions will be included on each Authority to Construct permit:

- *When this tank is used for wine or spirits storage, daily throughput records, including records of filling and emptying operations, the dates of such operations, a unique identifier for each batch, the volume percent ethanol in the batch, and the volume of wine or sprit transferred, shall be maintained. [District Rules 2201 and 4694]*

- *When this tank is used for wine storage, the operator shall record, on a weekly basis, the total gallons of wine contained in the tank and the maximum temperature of the stored wine.[District Rules 2201 and 4694]*

Compliance is expected with this Rule.

California Health & Safety Code 42301.6 (School Notice)

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

California Environmental Quality Act (CEQA)

CEQA requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The District adopted its *Environmental Review Guidelines* (ERG) in 2001. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities;
- Identify the ways that environmental damage can be avoided or significantly reduced;
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible; and
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

Greenhouse Gas (GHG) Significance Determination

District is a Responsible Agency

It is determined that another agency has prepared an environmental review document for the project. The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CEQA Guidelines §15381). As a Responsible Agency, the District is limited to mitigating or avoiding impacts for which it has statutory authority. The District does not have statutory authority for regulating greenhouse gas emissions. The District has determined that the applicant is responsible for implementing greenhouse gas mitigation measures, if any, imposed by the Lead Agency.

District CEQA Findings

The County of San Joaquin (County) is the public agency having principal responsibility for approving the project. As such, the County served as the Lead Agency (CCR §15367). In approving the project, the Lead Agency prepared and adopted a Negative Declaration. The Lead agency filed a Notice of Determination, stating that the environmental document was adopted pursuant to the provisions of CEQA and concluding that the project would not have a significant effect on the environment.

The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CCR §15381). As a Responsible Agency the District complies with CEQA by considering the environmental document prepared by the Lead Agency, and by reaching its own conclusion on whether and how to approve the project (CCR §15096).

The District has considered the Lead Agency's environmental document and finds that it adequately characterizes the project's potential impact on air quality. In addition, all feasible and cost-effective control measures to reduce potential impacts on air quality resulting from project related stationary source emissions have been applied to the project as part of BACT. Furthermore, the District has conducted an engineering evaluation of the project, this document, which demonstrates that Stationary Source emissions from the project would be reduced. Thus, the District finds that through a combination of project design elements, compliance with applicable District rules and regulations, and compliance with District air permit conditions, project specific stationary source emissions would be reduced to lessen the impacts on air quality. The District does not have authority

over any of the other project impacts and has, therefore, determined that no additional findings are required (CEQA Guidelines §15096(h)).

Indemnification Agreement/Letter of Credit Determination

The proposed project requires only ministerial approval, and is exempt from the provisions of CEQA. As such, an Indemnification Agreement and/or a Letter of Credit will not be required for this project in the absence of expressed public concern.

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Pending a successful NSR Public Noticing period, issue the ATCs subject to the permit conditions on the attached draft sample ATC in **Appendix I**.

X. Billing Information

Annual Permit Fees			
Permit Number	**Fee Schedule**	**Fee Description**	**Previous Fee Schedule**
N-7855-449-1 through '-508-1	3020-05-C	25,885 gal	3020-05-C
N-7855-631-1 through '-650-1	3020-05-A	2,600 gal	3020-05-A
N-7855-651-1 through '-670-1	3020-05-B	5,282 gal	3020-05-B
N-7855-671-1 through '-688-1, And '-699-1 through '-700-1	3020-05-B	10,587 gal	3020-05-B
N-7855-689-1 through '-698-1	3020-05-B	15,500 gal	3020-05-B
N-7855-747-1 through '-751-1 and '-772-1 through 776-1	3020-05-C	20,219 gal	3020-05-C
N-7855-752-1 through '-756-1 and '-767-1 through 771-1	3020-05-B	13,487 gal	3020-05-B
N-7855-757-1 through '-766-1	3020-05-B	8,031 gal	3020-05-B

Appendixes

I: Draft ATC Sample
II: Current PTO Sample
III: FYI 114
IV: BACT Guidelines and Top-Down BACT Analysis
V: Quarterly Net Emissions Change
VI: Compliance Certification
VII: Comparison Sheet Ducting/Piping Costs

APPENDIX I

Draft ATC Sample

(Permit conditions identical for all units in this project)

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: N-7855-449-2

ISSUANCE DATE: DRAFT

LEGAL OWNER OR OPERATOR: SUTTER HOME WINERY
MAILING ADDRESS: P O BOX 248
ST HELENA, CA 94574-0248

LOCATION: 18667 N JACOB BRACK RD
LODI, CA 95242

EQUIPMENT DESCRIPTION:
MODIFICATION OF 25,885 GALLON STEEL WHITE WINE FERMENTATION TANK AND WINE STORAGE TANK (TANK 1116) WITH PRESSURE/VACUUM VALVE AND INSULATION: INCREASE THE MAXIMUM ETHANOL CONTENT LIMIT TO 60%

CONDITIONS

1. The VOC emissions rate for fermentation operations in this tank shall not exceed 1.62 lb/day per 1000 gallons of tank capacity. [District Rule 2201] Federally Enforceable Through Title V Permit
2. The ethanol content of wine or spirit stored in this tank shall not exceed 60 percent by volume. [District Rule 2201] Federally Enforceable Through Title V Permit
3. When this tank is used for wine or spirit storage, the daily tank throughput, in gallons, shall not exceed five times the maximum nominal tank capacity stated on the equipment description. [District Rule 2201] Federally Enforceable Through Title V Permit
4. When used for wine or spirit storage, this tank shall be equipped with and operated with a pressure-vacuum relief valve, which shall operate within 10% of the maximum allowable working pressure of the tank, operate in accordance with the manufacturer's instructions, and be permanently labeled with the operating pressure settings. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit
5. When used for wine or spirit storage, this tank and the pressure-vacuum relief valve 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. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

Arnaud Marjollet, Director of Permit Services

Northern Regional Office • 4800 Enterprise Way • Modesto, CA 95356-8718 • (209) 557-6400 • Fax (209) 557-6475

6. The temperature of the wine stored in this tank shall be maintained at or below 75 degrees Fahrenheit. For each batch of wine, the operator shall achieve the storage temperature of 75 degrees Fahrenheit or less within 60 days after completing fermentation, and shall maintain records to show when the required storage temperature of 75 degrees Fahrenheit or less was achieved. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit

7. The average fermentation temperature of each batch of must fermented in this tank shall not exceed 95 degrees Fahrenheit, calculated as the average of all temperature measurements for the batch taken at least every 12 hours over the course of the fermentation. [District Rule 2201] Federally Enforceable Through Title V Permit

8. For each batch of must fermented in this tank, the operator shall record the fermentation completion date, the total gallons of must fermented, the average fermentation temperature and the uncontrolled fermentation emissions and fermentation emission reductions (calculated per the emission factors given in District Rule 4694). The information shall be recorded by the tank Permit to Operate number and by wine type, stated as either red wine or white wine. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit

9. When this tank is used for wine or spirit storage, daily throughput records, including records of filling and emptying operations, the dates of such operations, a unique identifier for each batch, the volume percent ethanol in the batch, and the volume of wine transferred, shall be maintained. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit

10. When this tank is used for wine storage, the operator shall record, on a weekly basis, the total gallons of wine contained in the tank and the maximum temperature of the stored wine. [District Rule 4694] Federally Enforceable Through Title V Permit

11. Annual emissions from all wine fermentation and wine or spirits storage tanks, calculated on a twelve month rolling basis, shall not exceed the following limit: VOC - 292,950 lb/year. [District Rule 2201] Federally Enforceable Through Title V Permit

12. Combined annual VOC emissions from all wine and spirits storage operations shall be determined as the sum of the emissions for each individual wine or spirit movement based on the volume transferred in each wine or spirit movement and the batch-specific storage emission factor calculated using the equation(s) specified within this permit. [District Rule 2201] Federally Enforceable Through Title V Permit

13. The annual VOC wine or spirit storage emission factor (EF) for each wine or spirit transfer shall be selected from the following emission factors based on the ethanol content of the wine transferred: For a wine or spirit with an ethanol content less than 14 volume percent: EF = 0.130 lb-VOC/1000 gallons; For a wine or spirit with an ethanol content between 14 and 21 volume percent, EF = 0.189 lb-VOC/1000 gallons; For a wine or spirit with ethanol content between 21 and 24 volume percent, EF = 0.213 lb-VOC/1000 gallons; For a wine or spirit with an ethanol content between 24 and 30 volume percent, EF = 0.252 lb-VOC/1000 gallons; For a wine or spirit with an ethanol content between 30 and 45 volume percent, EF = 0.342 lb-VOC/1000 gallons; For a wine or spirit with ethanol content between 45 and 60 volume percent, EF = 0.413 lb-VOC/1000 gallons. [District Rule 2201] Federally Enforceable Through Title V Permit

14. Total annual VOC emissions from wine fermentation operations shall be determined by the following formula: Total annual VOC emissions = (Total Annual Red Wine Production-gal) x (6.2 lb-VOC/1000 gal) + (Total Annual White Wine Production-gal) x (2.5 lb-VOC/1000 gal). [District Rule 2201] Federally Enforceable Through Title V Permit

15. A Three-Year Compliance Plan that demonstrates compliance with the requirements of Section 5.1 of District Rule 4694 for each year of the applicable compliance period shall be submitted to the District by no later than December 1, 2012, and every three years thereafter on or before December 1. [District Rule 4694]

16. A Three-Year Compliance Plan Verification that demonstrates that the Three-Year Compliance Plan elements are in effect shall be submitted to the District by no later than July 1, 2013, and every three years thereafter on or before July 1. [District Rule 4694]

17. An Annual Compliance Plan Demonstration that shows compliance with the applicable requirements of this rule shall be submitted to the District by no later than March 1, 2012, and every year thereafter on or before March 1. [District Rule 4694]

CONDITIONS CONTINUE ON NEXT PAGE

18. 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. [District Rule 4694]

19. Operators using District Obtained Emission Reductions (DOER) shall submit payment of DOER and administrative fees to the District no later than March 1, of the first year in the applicable compliance period. [District Rule 4694]

20. {4659} The permittee shall maintain the following records: red wine and white wine produced by fermentation at this facility, based on values reported to the Alcohol and Tobacco Tax and Trade Bureau (TTB), U.S. Department of the Treasury; the volume and the ethanol concentration of each wine movement; and the calculated 12 month rolling VOC emission rate (lb-VOC per 12 month rolling period, calculated monthly). [District Rule 2201] Federally Enforceable Through Title V Permit

21. {4660} If the emissions calculated for any rolling 12-month period exceed the annual emissions limitations of this permit, in a crush season in which the start of the crush season (defined as the day on which the facility's seasonal crushing/fermentation operations commence) occurs less than 365 days after the start of the previous crush season, then no violation of the annual emissions limit for that rolling 12-month period will be deemed to have occurred so long as the calendar year emissions are below the annual emissions limitation. [District Rule 2201] Federally Enforceable Through Title V Permit

22. {4661} Records shall be maintained that demonstrate the date of each year's start of crush season. [District Rule 2201] Federally Enforceable Through Title V Permit

23. All records shall be retained on-site for a period of at least five years and made available for District inspection upon request. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit

APPENDIX II

Current PTO Sample

(Existing Permit conditions identical for all units in this project)

San Joaquin Valley
Air Pollution Control District

PERMIT UNIT: N-7855-449-1 **EXPIRATION DATE:** 03/31/2018

EQUIPMENT DESCRIPTION:
25,885 GALLON STEEL WHITE WINE FERMENTATION TANK AND WINE STORAGE TANK (TANK 1116) WITH PRESSURE/VACUUM VALVE AND INSULATION

PERMIT UNIT REQUIREMENTS

1. The VOC emissions rate for fermentation operations in this tank shall not exceed 1.62 lb/day per 1000 gallons of tank capacity. [District Rule 2201] Federally Enforceable Through Title V Permit
2. The ethanol content of wine stored in this tank shall not exceed 23.9 percent by volume. [District Rule 2201] Federally Enforceable Through Title V Permit
3. When this tank is used for wine storage, the daily tank throughput, in gallons, shall not exceed five times the maximum nominal tank capacity stated on the equipment description. [District Rule 2201] Federally Enforceable Through Title V Permit
4. When used for wine storage, this tank shall be equipped with and operated with a pressure-vacuum relief valve, which shall operate within 10% of the maximum allowable working pressure of the tank, operate in accordance with the manufacturer's instructions, and be permanently labeled with the operating pressure settings. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit
5. When used for wine storage, this tank and the pressure-vacuum relief valve 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. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit
6. The temperature of the wine stored in this tank shall be maintained at or below 75 degrees Fahrenheit. For each batch of wine, the operator shall achieve the storage temperature of 75 degrees Fahrenheit or less within 60 days after completing fermentation, and shall maintain records to show when the required storage temperature of 75 degrees Fahrenheit or less was achieved. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit
7. The average fermentation temperature of each batch of must fermented in this tank shall not exceed 95 degrees Fahrenheit, calculated as the average of all temperature measurements for the batch taken at least every 12 hours over the course of the fermentation. [District Rule 2201] Federally Enforceable Through Title V Permit
8. For each batch of must fermented in this tank, the operator shall record the fermentation completion date, the total gallons of must fermented, the average fermentation temperature and the uncontrolled fermentation emissions and fermentation emission reductions (calculated per the emission factors given in District Rule 4694). The information shall be recorded by the tank Permit to Operate number and by wine type, stated as either red wine or white wine. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit
9. When this tank is used for wine storage, daily throughput records, including records of filling and emptying operations, the dates of such operations, a unique identifier for each batch, the volume percent ethanol in the batch, and the volume of wine transferred, shall be maintained. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit

PERMIT UNIT REQUIREMENTS CONTINUE ON NEXT PAGE

10. When this tank is used for wine storage, the operator shall record, on a weekly basis, the total gallons of wine contained in the tank and the maximum temperature of the stored wine. [District Rule 4694] Federally Enforceable Through Title V Permit

APPENDIX III
FYI 114

FYI-114

SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT

DATE: March 8, 2007 (Revised 09/14/09) (Revised 8/10/11) (Revised 6/13/12)

TO: Permit Services Staff

FROM: Dennis Roberts

SUBJECT: VOC Emission Factors for Wine Fermentation and Storage Tanks

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Winery tank operations generally consist of two separate emissions units; 1) fermentation and 2) storage of wine and spirits. Any particular tank may be permitted to perform one or both of these operations. The emissions from each emission unit are appropriately combined to yield the Potential to Emit for the tank (permit unit).

Emissions from fermentation operations are estimated using emission factors which have been developed based on a recognized fermentation model and are presented herein. For wine storage operations, emissions can be determined in general by modeling the storage tank operation using the EPA's Tanks 4.0 software (modeling procedures and an ethanol/water data base have been established as described in FYI-295 (*Modeling Emissions from Wine Storage Tanks)*. However, the majority of wine storage tanks located in the District are insulated storage tanks which do not have a requirement for refrigeration (ambient storage temperature). For this classification of tank the storage emission factor, as calculated by the Tanks 4.0 model, is a function of ethanol content only. For this case the tabular emission factors presented herein are applicable (note that storage tanks which are un-insulated and/or which have NSR limits on the tank operating temperature should be estimated by the emissions modeling per FYI-295).

Wine Storage Tanks

Wine storage tanks perform two functions in the winery:

- Facilitation of post-fermentation processing operations such as racking, filtration, malolactic fermentation and bottling. In this role, the typical storage tank is filled and emptied several times per year with the wine being transferred from tank to tank. Many of these operations occur prior to chilling of the wine. Emissions from such operations are "working losses" which occur as a result of the displacement of the vapor space of the tank into the atmosphere during the filling operations. For insulated tanks (or tanks installed in a climate-controlled building), working losses are a function only of the ethanol content, the ambient temperature and the tank throughput.

- Static storage of wine between processing operations up to the final operation of bottling. In this operation, a common objective is to avoid oxidation of the wine by both minimizing the wine temperature and the exposure of the wine to air. In such cases, the wine may be maintained at a temperature below ambient, often in the range of 35-40 °F, however, since the tank cannot be always maintained at this temperature due to processing considerations, the lower temperatures are not an NSR condition on the permit . Also, the tanks are typically maintained at as high a liquid level as possible to minimize contact with oxygen. Emissions from static storage are

"breathing losses" which are the result of diurnal heating and cooling caused by the effect of daily variations in atmospheric conditions on the contents of the tank. For a well-insulated tank, equipped with a pressure/vacuum relief valve per the requirements of District Rule 4694, breathing losses are considered to be negligible since the insulation serves to maintain a relatively uniform temperature inside the tank while the pressure/vacuum valve serves to contain small internal variations, preventing escape of vapor to the atmosphere.

Table 1 presents emission factors for wine and spirits storage in ambient temperature tanks (non-refrigerated), equipped with insulation and/or located in a climate-controlled building. The tabular values have been developed using the District's emissions modeling procedure for wine and spirits tanks (see FYI-295). As shown, different emission factors are presented for tanks located in the three different regions of the District based upon higher ambient temperatures in the southern part of the Central Valley. All factors represent working losses only since breathing losses are considered negligible as discussed above. Emission factors for concentrations not listed in Table 1 may be interpolated from the table.

Table 1: Emission Factors for Wine and Spirits Storage Tanks by Region in the San Joaquin Valley
lb-VOC per 1,000 gallons of throughput

Applicability:	1. Vertical Fixed-Roof tank, insulated or located in climate-controlled building 2. Ambient temperature storage					
	Southern Region		Central Region		Northern Region	
Vol %	Annual	Daily	Annual	Daily	Annual	Daily
2	0.016	0.029	0.015	0.027	0.014	0.024
4	0.033	0.062	0.032	0.057	0.030	0.051
6	0.052	0.099	0.050	0.092	0.047	0.081
8	0.074	0.141	0.071	0.130	0.067	0.116
10	0.098	0.187	0.094	0.173	0.088	0.154
12	0.125	0.239	0.120	0.221	0.112	0.196
14	0.143	0.273	0.137	0.252	0.128	0.223
16	0.159	0.302	0.153	0.280	0.143	0.248
18	0.176	0.334	0.169	0.310	0.159	0.275
20	0.195	0.368	0.187	0.341	0.175	0.303
22	0.215	0.404	0.207	0.375	0.194	0.333
24	0.237	0.443	0.227	0.412	0.213	0.366
26	0.251	0.470	0.242	0.436	0.227	0.388
28	0.264	0.494	0.254	0.458	0.238	0.408
30	0.278	0.518	0.267	0.481	0.251	0.428
32	0.293	0.544	0.281	0.506	0.264	0.450
34	0.308	0.572	0.296	0.531	0.278	0.473
36	0.324	0.600	0.312	0.559	0.293	0.498
38	0.335	0.620	0.323	0.577	0.303	0.514
40	0.347	0.640	0.334	0.595	0.313	0.530
42	0.358	0.660	0.345	0.614	0.324	0.546
44	0.371	0.681	0.357	0.634	0.335	0.565
46	0.384	0.703	0.370	0.655	0.348	0.584
48	0.396	0.724	0.381	0.674	0.359	0.602
50	0.405	0.738	0.390	0.688	0.367	0.615
52	0.415	0.754	0.400	0.703	0.376	0.628
54	0.425	0.770	0.410	0.718	0.386	0.642
56	0.436	0.788	0.420	0.734	0.396	0.657
58	0.447	0.805	0.431	0.751	0.406	0.673
60	0.455	0.818	0.438	0.764	0.413	0.684
62	0.462	0.832	0.446	0.777	0.420	0.695
64	0.471	0.847	0.454	0.790	0.427	0.708
66	0.479	0.863	0.462	0.805	0.435	0.721
68	0.489	0.879	0.471	0.820	0.443	0.735
70	0.497	0.896	0.479	0.836	0.451	0.748
72	0.507	0.914	0.488	0.853	0.460	0.763
74	0.517	0.933	0.498	0.871	0.468	0.779
76	0.527	0.954	0.508	0.890	0.478	0.796
78	0.539	0.976	0.519	0.910	0.489	0.814
80	0.552	1.000	0.531	0.932	0.500	0.833
82	0.566	1.025	0.545	0.955	0.513	0.855
84	0.581	1.052	0.559	0.981	0.526	0.877
86	0.598	1.083	0.576	1.010	0.542	0.903
88	0.617	1.120	0.595	1.044	0.559	0.934
90	0.639	1.161	0.616	1.082	0.579	0.967
92	0.663	1.206	0.639	1.124	0.601	1.004
94	0.694	1.261	0.669	1.175	0.629	1.050
96	0.742	1.339	0.715	1.249	0.673	1.118
98	0.786	1.409	0.757	1.315	0.714	1.179
100	0.838	1.534	0.807	1.437	0.762	1.278

For purposes of calculating actual annual emissions, the annual data in Table 1 have been curve-fitted based on an equation of the form $E_f = ap^2 + bp + c$, where p = vol% ethanol (e.g., 20% = 0.20). The constants for the equation are as follows:

Constants for Emission Factor Correlation

$E_f = \mathbf{a}p^2 + \mathbf{b}p + \mathbf{c}$

p = volume percentage ethanol

Southern Region			
Concentration Range	**a**	**b**	**c**
0 to 24%	-0.45139	1.0958	0
>24 to 66%	-0.47357	1.0088	0.019486
>66% to 92%	1.5279	-1.7467	0.97149
>92% to 100%	6.7857	-10.819	4.8713
Central Region			
Concentration Range	**a**	**b**	**c**
0 to 24%	-0.45139	1.0542	0
>24 to 66%	-0.45117	0.96968	0.018554
>66% to 92%	1.5254	-1.7662	0.96812
>92% to 100%	6.4286	-10.223	4.6016
Northern Region			
Concentration Range	**a**	**b**	**c**
0 to 24%	-0.38194	0.97917	0
>24 to 66%	-0.42159	0.91316	0.016237
>66% to 92%	1.3799	-1.5774	0.87906
>92% to 100%	6.6071	-10.651	4.8061

The mathematical correlation for concentrations up to 24% provides a slightly conservative estimate of the emission factor relative to the data in Table 1 based on smoothing the impact of the linear interpolation process employed in development of the ethanol/water data base used for modeling wine tank emissions in EPA Tanks 4.0. Mathematical correlations for concentrations greater than 24% are based on a least square analysis of the data in Table 1.

Use of Table I and correlations to estimate emissions insulated wine storage tank subject to ambient temperature is demonstrated by the following examples:

Example 1 (wine storage tank with daily and annual throughput limits and maximum ethanol content) – estimate the potential to emit for an insulated 100,000 gallon nominal capacity steel storage tank to store wine with maximum concentration of 14 vol% ethanol . Maximum daily throughput is one tank turn or 100,000 gallons/day. Maximum annual throughput will be 600,000 gallons per year. The tank will be installed in a facility located in the Southern Region.

For a storage tank located in the Southern Region and handling up to 14% ethanol, the annual emission factor is 0.143 lb-VOC/1000 gallons throughput and the daily emission factor is 0.273 lb-VOC/1000 gallons throughput.

Daily PE = 100,000 gallons/day x 0.273 lb-VOC/1000 gallons = 27.3 lb-VOC/day

Annual PE = 600,000 gallons/year x 0.143 lb-VOC/1000 gallons = 86 lb-VOC/year

DEL conditions for this example would be:

- *Ethanol content of wine in this tank shall not exceed 14.0 percent by volume. [District Rule 2201]*
- *Tank throughput shall not exceed either of the following limits: 100,000 gallons in any one day or 600,000 gallons per year. [District Rule 2201]*

Example 2 (wine and spirits storage tank subject to a daily throughput limit and an SLC limit on annual emissions)– – estimate the potential to emit for an insulated 100,000 gallon nominal capacity steel storage tank to store spirits with maximum concentration of 80 vol% ethanol. Maximum allowed annual emissions for the tanks in the SLC are 10,000 lb/year. Maximum daily throughput is one tank turn or 100,000 gallons/day. The tank will be installed in a facility located in the Northern Region.

For a storage tank located in the Northern Region and handling up to 80% ethanol, the daily emission factor is 0.833 lb-VOC/1000 gallons throughput. Since the annual emissions are constrained by the SLC, an annual emission factor is not needed for the PE calculation but will be placed on the permit for purposes of demonstrating annual compliance on an ongoing basis. Since the ethanol concentration can vary from 0% to 80%, three separate correlation equations are required to cover the potential range:

For concentration p = 0 – 24%: $E_f = ap^2 + bp + c$

a = -0.38194
b = 0.97917
c = 0

For concentration p = 24% < p < 66%: $E_f = ap^2 + bp + c$

a = -0.42159
b = 0.91316
c = 0.016237

For concentration p = 66% < p < 80%: $E_f = ap^2 + bp + c$

a = 1.3799
b = -1.5774
c = 0.87906

Daily PE = 100,000 gallons/day x 0.833 lb-VOC/1000 gallons = 83.3 lb-VOC/day

DEL conditions for this example would be:

- *Ethanol content of wine or spirits in this tank shall not exceed 80.0 percent by volume. [District Rule 2201]*
- *Tank throughput shall not exceed 100,000 gallons in any one day. [District Rule 2201]*
- *Combined annual VOC emissions from all wine storage operations under permit units X-XXXX-XXX through X-XXXX-XXX shall not exceed 10,000 pounds per year. [District Rule 2201]*
- *Combined annual VOC emissions from wine storage operations under permit units X-XXXX-XXX through X-XXXX-XXX shall be determined as the sum of the emissions for each individual wine movement based on the volume transferred in each wine movement and the batch-specific wine storage emission factor calculated using the equation(s) specified within this permit. [District Rule 2201]*
- *The annual VOC wine storage emission factor for each wine or spirits ethanol content shall be calculated using the following equation: EF = a * P^2 + b*P + c; where EF is the VOC emission factor in pounds of VOC per 1000 gallons of wine throughput; and P is the volume percent ethanol of the wine being transferred. For concentrations up to and including 24 volume %,* a = -0.38194, b = 0.97917 and c = 0. *For concentrations greater than 24 volume % up to and including 66 volume% ,* a = -0.42159, b = 0.91316 and c = 0.016237. *For concentrations greater than 66 volume % up to and including 80 volume %,* a = 1.3799, b = -1.5774 and c = 0.87906. *[District Rule 2201]*

Wine Fermentation Tanks

During the wine fermentation process, sugar in the grape juice reacts with yeast to form alcohol (ethanol) and carbon dioxide (CO_2) gas. Ethanol is emitted into the atmosphere through evaporation. According to Williams and Boulton[1], the only important mechanism for ethanol loss is equilibrium evaporation into the escaping CO_2 stream. The physical entrainment of ethanol droplets in the CO_2 gas is insignificant in modern enclosed fermentation vessels. These researchers' model indicates that as fermentation temperature increases, ethanol loss increases exponentially. Since red wines are fermented at significantly higher temperatures than white wine, a different emission factor is required for each case.

Annual Fermentation Emission Factors

The California Air Resources Board (CARB) has established annual emission factors for fermentation of both red and white wines, based on the computer model developed by Williams and Boulton. The emission factors were developed for purposes of emission

[1] L.A. Williams and R. Boulton, Modeling and Prediction of Evaporative Ethanol Loss During Wine Fermentation, American Journal of Enology and Vitriculture, 32:234-242, (1983).

inventory estimation and represent a typical wine fermentation operation based on average fermentation temperatures and average initial sugar concentrations (°Brix) and are presented in Emissions Inventory Procedural Manual, Section 5.1, Air Resources Board, 1997. These factors have been adopted by the District in Rule 4694, *Wine Fermentation and Storage Tanks*. The established factors are as follows:

Red Wine Fermentation:	6.2 lb-VOC/1000 gallons fermented per year (78 °F fermentation temperature, 21.8 °Brix)
White Wine Fermentation:	2.5 lb-VOC/1000 gallons fermented per year (58 °F fermentation temperature, 20.4 °Brix)

Daily Fermentation Emission Factors

The District has developed factors for daily Potential to Emit using the previously-referenced research by Williams and Boulton (see Appendix A). To ensure the factors represent true Potential to Emit, the daily emission factors were developed based on typical maximum fermentation temperatures and starting sugar concentrations rather than average values:

Red Wine Fermentation:	3.46 lb-VOC/1000 gallons tank capacity per day (85 °F fermentation temperature, 22.5 °Brix)
White Wine Fermentation:	1.62 lb-VOC/1000 gallons tank capacity per day (70 °F fermentation temperature, 22.5 °Brix)

Example 3 (fermentation tank) - estimate the daily and annual potential to emit for a 200,000 gallon nominal capacity fermentation tank to exclusively ferment red wine. Maximum fermentation throughput will be 900,000 gallons red wine per year. The tank will not be used for storage.

Daily $PE_{fermentation}$ = 3.46 lb-VOC/day per 1000 gallons nominal tank capacity x 200 Mgal nominal

Daily $PE_{fermentation}$ = 692.1 lb/day

Daily PE = Daily $PE_{fermentation}$ = 692.1 lb/day

Annual PE = 6.2 lb-VOC per 1000 gallons fermented x 900 Mgal/year = 5,580 lb-VOC/yr

Example 5 (fermentation and storage tank) - estimate the daily and annual potential to emit for a 100,000 gallon nominal capacity fermentation tank to ferment red wine. Maximum fermentation throughput will be 450,000 gallons red wine per year. The tank will also be used for storage identical with example 1:

In this case,

Daily PE = the larger of either Daily $PE_{fermentation}$ or Daily $PE_{storage}$

And.

Annual PE = Annual $PE_{fermentation}$ + Annual $PE_{storage}$

Calculating the Daily PE:

Daily $PE_{fermentation}$ = 3.46 lb-VOC/day per 1000 gallons nominal tank capacity x 100 Mgal nominal

Daily $PE_{fermentation}$ = 346.0 lb-VOC/day

From example 1,

Daily $PE_{storage}$ = 27.3 lb-VOC/day

Therefore,

Daily PE = 346.0 lb/day

Calculating the Annual PE:

Annual $PE_{fermentation}$ = 6.2 lb-VOC per 1000 gallons fermented x 450 Mgal/year = 2,790 lb-VOC/yr

From example 1,

Annual $PE_{storage}$ = 97 lb-VOC/year

Therefore,

Annual PE = 2,790 + 97 = 2,887 lb/year

Appendix A

Daily Emission Factor for Wine Fermentation

Appendix A

The emission factor for daily PE is based on the following:

- Estimation of maximum daily fermentation emissions is based on Figure 7 from the Williams and Boulton work referenced in the body of this document.
- Maximum red wine fermentation temperature is assumed to be 85 °F.
- Maximum white wine fermentation temperature is assumed to be 70 °F.
- Maximum working capacity of a red wine fermenter is 80% of tank maximum capacity.
- Maximum working capacity of a white wine fermenter is 95% of tank maximum capacity.

Figure 7 from Williams and Boulton indicates the ethanol emission rate (mg per hour per liter of wine) versus time for various fermentation temperatures. The total emissions in mg per liter of wine for any time period is the area under the curve. Thus, for any given temperature, figure 7 can be graphically integrated over the 24 hour period during which maximum emissions occur. A copy of figure 7 is attached which indicates the integration interval for red wine (85 °F) and for white wine (70 °F). Results of integration of Figure 7 are presented in the following table:

Graphical Integration Results to Determine Daily Fermentation Emission Factor from Figure 7 of Williams and Boulton

	Red Wine	White Wine
Maximum 24 hour Emissions (mg/liter of wine per day)	518.6	203.9
Maximum 24 hour Emissions (1b/1000 gallons of wine per day)	4.33	1.70
Maximum Batch Size (% of Tank Capacity)	80%	95%
Daily Emission Factor (lb/1000 gallons tank capacity per day)	3.46	1.62

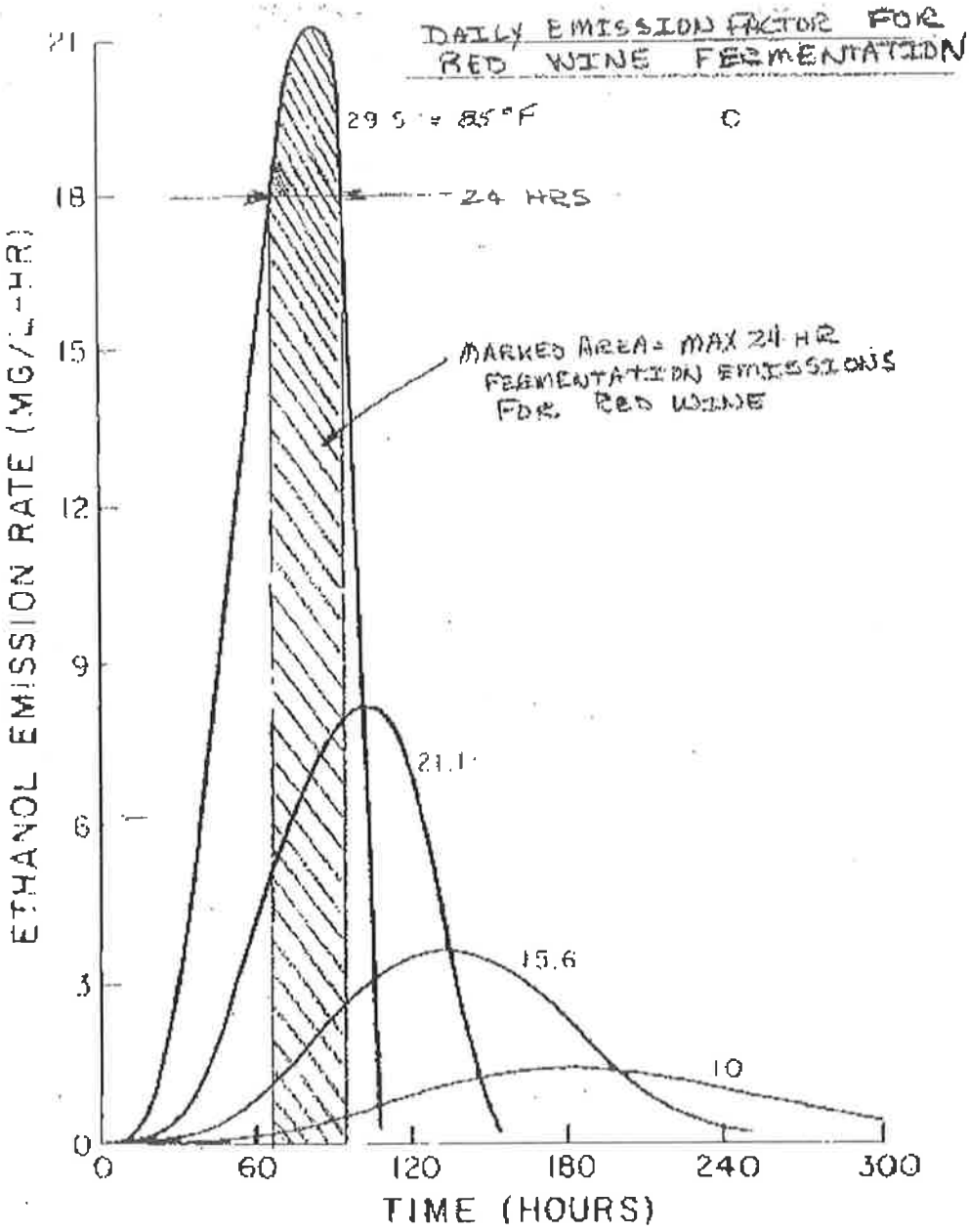


Fig. 7. The influence of fermentation temperature on a) the fermentation rate, b) the vapor phase ethanol concentration, and c) the rate of ethanol emission. (Initial sugar content of 22.5°Brix, isothermal fermentation at indicated temperature.)

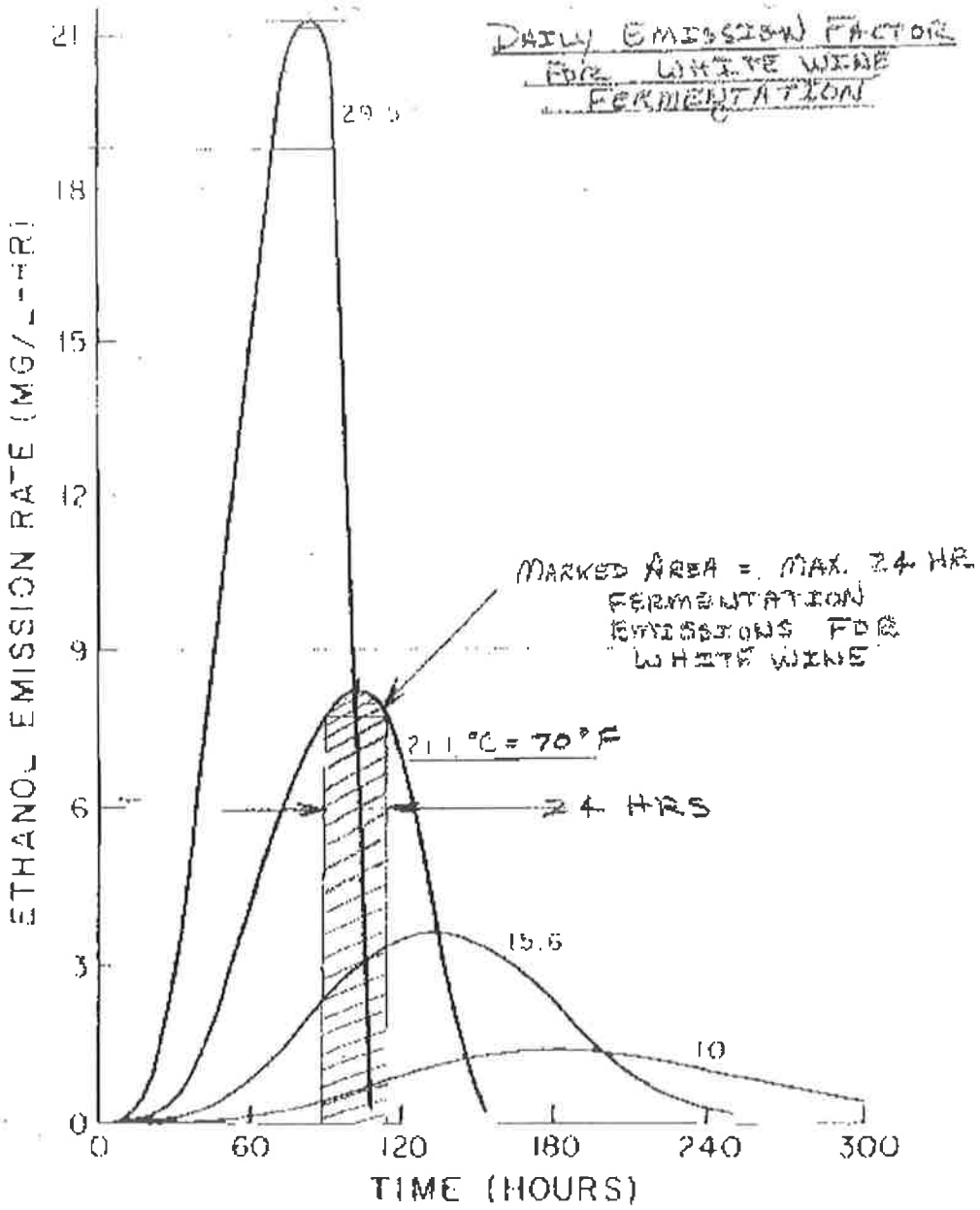


Fig. 7. The influence of fermentation temperature on a) the fermentation rate, b) the vapor phase ethanol concentration, and c) the rate of ethanol emission. (Initial sugar content of 22.5°Brix, isothermal fermentation at indicated temperature.)

APPENDIX IV
BACT Guidelines and Top-Down BACT Analysis

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 5.4.13*

Last Update: 09/26/2011

Wine Storage Tank - Non-Wood Material**

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	1. Insulation or Equivalent***, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum allowable working pressure of the tank; "gas-tight" tank operation; and continuous storage temperature not exceeding 75 degrees F, achieved within 60 days of completion of fermentation.	1. Capture of VOCs and thermal or catalytic oxidation or equivalent (98% control) 2. Capture of VOCs and carbon adsorption or equivalent (95% control) 3. Capture of VOCs and absorption or equivalent (90% control) 4. Capture of VOCs and condensation or equivalent (70% control)	

**This guideline is applicable to a wine storage tank that is not constructed out of wooden materials.
***Tanks made of heat-conducting materials such as stainless steel may be insulated or stored indoors (in a completely enclosed building, except for vents, doors and other essential openings) to limit exposure ot diurnal temperature variations. Tanks made entirely of non-conducting materials such as concrete (except for fittings) are considered self-insulating.

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in s a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source**

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 5.4.15*

Last Update: 11/02/2011

Distilled Spirits Storage Tank

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Insulation or Equivalent**, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum allowable working pressure of the tank; "gas-tight" tank operation	1) Capture of VOCs and thermal or catalytic oxidation or equivalent (98% control); 2) Capture of VOCs and carbon adsorption or equivalent (95% control); 3) Capture of VOCs and adsorption or equivalent (90% control); 4) Refrigerated Storage (70% control)	

** Tank may be insulated or stored indoors (in a completely enclosed building except for vents, doors and other essential openings) to limit exposure to diurnal temperature variations.

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in s a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source**

Top-Down BACT Analysis for Fermentation VOCs From Wine and Distilled Spirits Storage Operations

Step 1 - Identify All Possible Control Technologies

The SJVUAPCD BACT Clearinghouse guideline 5.4.13 identifies the following control equipment options for VOC emissions from wine storage tanks.

1) Insulation or Equivalent, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum allowable working pressure of the tank; "gas-tight" tank operation; and continuous storage temperature not exceeding 75 degrees F, achieved within 60 days of completion of fermentation.
2) Capture of VOCs and thermal or catalytic oxidation or equivalent (98% control)
3) Capture of VOCs and carbon adsorption or equivalent (95% control)
4) Capture of VOCs and absorption or equivalent (90% control)
5) Capture of VOCs and condensation or equivalent (70% control)

The SJVUAPCD BACT Clearinghouse guideline 5.4.15 identifies the following control equipment options for VOC emissions from distilled spirits storage tanks.

1) Insulation or Equivalent, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum allowable working pressure of the tank; "gas-tight" tank operation
2) Capture of VOCs and thermal or catalytic oxidation or equivalent (98% control)
3) Capture of VOCs and carbon adsorption or equivalent (95% control)
4) Capture of VOCs and absorption or equivalent (90% control)
5) Capture of VOCs and condensation or equivalent (70% control)

The only difference between the two guidelines is that the wine storage guideline requires a continuous storage temperature not exceeding 75 degrees F, achieved within 60 days of the completion of fermentation. Otherwise, the guidelines are identical.

Step 2 - Eliminate Technologically Infeasible Options

None of the above listed technologies are technologically infeasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

Rank by Control Effectiveness		
Rank	Control	Overall Capture and Control Efficiency
1	Capture of VOCs and thermal or catalytic oxidation or equivalent	98%(*)
2	Capture of VOCs and carbon adsorption or equivalent	95%
3	Capture of VOCs and absorption or equivalent	90%
4	Capture of VOCs and condensation or equivalent	70%
5	For Wine and Distilled Spirits Insulation or Equivalent, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum allowable working pressure of the tank; "gas-tight" tank operation. For Wine Only A continuous storage temperature not exceeding 75 degrees F, achieved within 60 days of completion of fermentation.	Baseline (Achieved-in-Practice)

(*) Following recent District practice, thermal and catalytic oxidation will be ranked together.

Step 4 - Cost Effectiveness Analysis

A cost effective analysis must be performed for all control options that have not been determined to be achieved in practice in the list from Step 3 above, in the order of their ranking, to determine the cost effective option with the lowest emissions.

District BACT Policy APR 1305 establishes annual cost thresholds for imposed control based upon the amount of pollutants reduced by the controls. If the cost of control is at or below the threshold, it is considered a cost effective control. If the cost exceeds the threshold, it is not cost effective and the control is not required. Per District BACT Policy, the maximum cost limit for VOC reduction is $17,500 per ton of VOC emissions reduced.

BACT Analysis Assumptions – All Control Options

- Sales Tax: This facility is located in Lodi, CA, which has a current sales tax rate of 8.0%. However, pollution control equipment qualifies for a partial tax exemption in California. According to the following link, the tax exemption rate is 4.1875%, http://www.boe.ca.gov/sutax/manufacturing_exemptions.htm#Purchasers . Therefore, the sales tax rate used in this analysis will be set equal to 3.8125% (8.0% - 4.1875%).

- Project Contingency: For detailed estimates, the Association for the Advancement of Cost Engineering International recommends a contingency factor of 15%, while the Electric Power Research Institute recommends a contingency of 10% to 20%.
  (See ftp://ftp.repec.org/opt/ReDIF/RePEc/sip/04-005.pdf).

  Therefore, a cost contingency of 15% will be applied to the detailed estimates provided in these cost analyses. Additionally, since both the direct and indirect costs are detailed estimates and both of these categories of costs have uncertainty, the contingency will be applied to both the direct and indirect costs.

- Although this analysis is for storage operations only, it is assumed that the winery would size the ductwork and system to also address fermentation emissions since the proposed tanks may be used for fermentation that emits VOC's at a higher rate. It would not be logical to undersize the system and to only utilize the control system for storage emissions, which represent only a small portion of the overall emissions from fermentation/storage tanks.

Tank Batteries

The following tank batteries were identified:

Tank Battery	# of tanks	Tank Permit #'s	Combined Capacity (gal)
1	20	N-7855-449 through '-468	517,700
2	20	N-7855-469 through '-488	517,700
3	20	N-7855-489 through '-508	517,700
4	30	N-7855-747 through '-776	417,370
5	20	N-7855-631 through '-650	52,000
6	20	N-7855-651 through '-670	105,640
7	16	N-7855-671 through –'686	169,392
8	14	N-7855-687 through '-700	197,348

Uncontrolled Storage Emissions

The proposed potential to emit for the tanks is based on the currently industry standard tank controls.

The following table shows the industry standard emissions for each tank battery associated with this project:

Tank Battery	Capacity (gallons)	Storage Turnovers Per Year	Storage Emissions (lb/year)
1	517,700	25	5,345
2	517,700	25	5,345
3	517,700	25	5,345
4	417,370	25	4,309
5	52,000	25	537
6	105,640	25	1,091
7	169,392	25	1,749
8	197,348	25	2,038
		Total	**25,759**

Collection System Capital Investment (based on ductwork)

A common feature of all technically feasible options is that they require installation of a collection system for delivering the VOCs from the tanks to the common control device(s).

Basis of Cost Information for Collection System:

- The costs for the ductwork and the required clean-in-place (CIP) system are based on information from the 2005 Eichleay Study. The 2005 Eichleay study was used in development of District Rule 4694 Wine Fermentation and Storage Tanks and includes substantial information on the costs and details of the potential application of VOC controls to wineries and addresses many of the technical issues of the general site specific factors for wineries.

- The District performed a cost survey of stainless steel ducting/piping and found that the values stated in the Eichleay report including the cost of inflation (applied as stated below) were less expensive; therefore, as a conservative estimate, the District will use the cost of ducting/piping from the Eichleay report which will include ducting, fittings, bolt up, handle, and install. A summary of the ducting/piping cost survey is included in Appendix VII.

- Eichleay's cost estimate for ducting included the duct, fittings, bolt up, handle and install; therefore, the District did not allow the additional costs for foundations & supports, handling & erection, electrical, piping or painting, as allowed by the EPA Cost Manual.

- The collection system consists of stainless steel place ductwork (stainless steel is required due to food grade product status) with isolation valving, connecting the tanks to a common manifold system which ducts the combined vent to the common control device. The cost of dampers and isolation valving, installed in the ductwork, will be included in the cost estimate.

- A minimum duct size is established at six inches diameter at each tank to provide adequate strength for spanning between supports.

- One of the major concerns of a manifold duct system is microorganisms spoiling the product, and transferring from one tank to another. It is necessary to design into the system a positive disconnect of the ducting system when the tanks are not being filled. There are a number of ways this can be done. In this case, an automatic butterfly valve with a physical spool to disconnect the tank from the duct will be utilized.

- The ducting/piping costs quoted in the Eichleay study are from 2005 and must be adjusted to reflect 2016 prices. An overall inflation amount of 21.93%, which was taken from the United States Department of Labor, Bureau of Labor Statistics, Consumer Price Index (CPI) Inflation Calculator and applied to the ducting/piping costs to determine the current 2016 prices: http://www.bls.gov/data/inflation_calculator.htm.

Capital Cost of Ductwork

This facility includes eight tank batteries. The capital cost for ductwork from each tank battery is estimated below. The

Tank Battery 1:

Connection from tank to main duct = 20 tanks x 10 feet (6" duct) x $62.17/foot = $12,434
Main duct for fermenters = 191' (6" duct) x $62.17/foot = $11,874
Unit installed cost for 6 inch butterfly valve = $2,125/valve x 20 valves x 1 system = $42,500
Unit installed cost one foot removable spool = $500/tank x 20 tanks x 1 system = $10,000
1 Knockout drum = $46,300
Duct support allowance = $4,000/tank x 20 tanks = $80,000

Total for Battery 1 = $12,434 + $11,874+ $42,500 + $10,000 + $46,300 + $80,000
= $203,108

Tank Battery 2:

Connection from tank to main duct = 20 tanks x 10 feet (6" duct) x $62.17/foot = $12,434
Main duct for fermenters = 191' (6" duct) x $62.17/foot = $11,874
Unit installed cost for 6 inch butterfly valve = $2,125/valve x 20 valves x 1 system = $42,500
Unit installed cost one foot removable spool = $500/tank x 20 tanks x 1 system = $10,000
1 Knockout drum = $46,300
Duct support allowance = $4,000/tank x 20 tanks = $80,000

Total for Battery 2 = $12,434 + $11,874+ $42,500 + $10,000 + $46,300 + $80,000
= $203,108

Tank Battery 3:

Connection from tank to main duct = 20 tanks x 10 feet (6" duct) x $62.17/foot = $12,434
Main duct for fermenters = 191' (6" duct) x $62.17/foot = $11,874
Unit installed cost for 6 inch butterfly valve = $2,125/valve x 20 valves x 1 system = $42,500
Unit installed cost one foot removable spool = $500/tank x 20 tanks x 1 system = $10,000
1 Knockout drum = $46,300
Duct support allowance = $4,000/tank x 20 tanks = $80,000

Total for Battery 3 = $12,434 + $11,874+ $42,500 + $10,000 + $46,300 + $80,000
= $203,108

Tank Battery 4:

Connection from tank to main duct = 30 tanks x 10 feet (6" duct) x $62.17/foot = $18,651
Main duct for fermenters = 220' (6" duct) x $62.17/foot = $13,677
Unit installed cost for 6 inch butterfly valve = $2,125/valve x 30 valves x 1 system = $63,750
Unit installed cost one foot removable spool = $500/tank x 30 tanks x 1 system = $15,000
1 Knockout drum = $46,300
Duct support allowance = $4,000/tank x 30 tanks = $120,000

Total for Battery 4 = $18,651 + $13,677+ $63,750 + $15,000 + $46,300 + $120,000
= $277,378

Tank Battery 5:

Connection from tank to main duct = 20 tanks x 10 feet (6" duct) x $62.17/foot = $12,434
Main duct for fermenters = 85' (6" duct) x $62.17/foot = $5,284
Unit installed cost for 6 inch butterfly valve = $2,125/valve x 20 valves x 1 system = $42,500
Unit installed cost one foot removable spool = $500/tank x 20 tanks x 1 system = $10,000
1 Knockout drum = $46,300
Duct support allowance = $4,000/tank x 20 tanks = $80,000

Total for Battery 5 = $12,434 + $5,284+ $42,500 + $10,000 + $46,300 + $80,000
= $196,518

Tank Battery 6:

Connection from tank to main duct = 20 tanks x 10 feet (6" duct) x $62.17/foot = $12,434
Main duct for fermenters = 110' (6" duct) x $62.17/foot = $6,839
Unit installed cost for 6 inch butterfly valve = $2,125/valve x 20 valves x 1 system = $42,500
Unit installed cost one foot removable spool = $500/tank x 20 tanks x 1 system = $10,000
1 Knockout drum = $46,300
Duct support allowance = $4,000/tank x 20 tanks = $80,000

Total for Battery 6 = $12,434 + $6,839+ $42,500 + $10,000 + $46,300 + $80,000
= $198,073

Tank Battery 7:

Connection from tank to main duct = 16 tanks x 10 feet (6" duct) x $62.17/foot = $9,947
Main duct for fermenters = 110' (6" duct) x $62.17/foot = $6,839
Unit installed cost for 6 inch butterfly valve = $2,125/valve x 16 valves x 1 system = $34,000
Unit installed cost one foot removable spool = $500/tank x 16 tanks x 1 system = $8,000
1 Knockout drum = $46,300
Duct support allowance = $4,000/tank x 16 tanks = $64,000

Total for Battery 7 = $9,947 + $6,839+ $34,000 + $8,000 + $46,300 + $64,000
= $169,086

Tank Battery 8:

Connection from tank to main duct = 14 tanks x 10 feet (6" duct) x $62.17/foot = $8,704
Main duct for fermenters = 115' (6" duct) x $62.17/foot = $7,150
Unit installed cost for 6 inch butterfly valve = $2,125/valve x 14 valves x 1 system = $29,750
Unit installed cost one foot removable spool = $500/tank x 14 tanks x 1 system = $7,000
1 Knockout drum = $46,300
Duct support allowance = $4,000/tank x 14 tanks = $56,000

Total for Battery 8 = $8,704 + $7,150+ $29,750 + $7,000 + $46,300 + $56,000
= $154,904

Total of Capital Cost for All Tank Batteries:

The total capital cost of the ductwork for all five tank groups is summarized in the table below:

Tank Battery	Total Ducting Cost Including Support Allowance
1	$203,108
2	$203,108
3	$203,108
4	$277,378
5	$196,518
6	$198,073
7	$169,086
8	$154,904
Total	**$1,605,283**

Capital Cost of Ductwork for Wine Storage Tanks	
Cost Description	Cost ($)
Combined Duct Estimate for all Tank Groups	$1,605,283
Adjusting factor for inflation from 2005 dollars to 2017 dollars (21.93% total increase)	1.2193
Inflation adjusted duct cost	$1,957,322
The following cost data is taken from EPA Control Cost Manual, Sixth Edition (EPA/452/B-02-001).	
Direct Costs	
Base Equipment Costs (Ductwork) See Above	$1,957,322
Instrumentation (not required)	-
Sales Tax - 3.8125% of base equipment	$74,623
Freight - 5% of base equipment	$97,866
Purchased equipment cost (PEC)	**$2,129,811**
Foundations & supports 8% (allowance already included in cost estimate)	-
Handling & erection 14% (already included in Eichleay cost estimate)	-
Electrical 4% (not required)	-
Piping 2% (not required)	-
Painting 1% (not required)	-
Insulation 1% of PEC	$21,298
Direct Installation Costs (DIC)	**$21,298**
Total Direct Costs (DC) (PEC + DIC)	**$2,151,109**
Indirect Costs	
Engineering - 10% of PEC	$212,981
Construction and field expenses - 5% of PEC	$106,491
Contractor Fees - 10% of PEC	$212,981
Start-up - 2% of PEC	$42,596
Performance Test - 1% of PEC	$21,298
Total Indirect Costs (IC)	**$596,347**
Total Direct and Indirect Costs (DC + IC)	**$2,747,456**
Contingency (C) - 15% of (DC + IC)	**$412,118**
Total Capital Investment (TCI) (DC + IC + C)	**$3,159,574**

Annualized Capital Cost for Piping

Annualized Capital Investment = Initial Capital Investment x Amortization Factor

Amortization Factor = $\left[\frac{0.1(1.1)^{10}}{(1.1)^{10}-1}\right]$ = 0.163 per District policy, amortizing over 10 years at 10%

Therefore,

Total Collection System Annualized Capital Investment = $3,159,574 x 0.163

Total Collection System Annualized Capital Investment = $515,011

Option 1 - Collection of VOCs and control by thermal or catalytic oxidation (98% collection & control):

Emission Reductions

Annual Emission Reduction =Storage Emissions x 0.98
= 25,759 lb-VOC/year x 0.98
= 25,244 lb-VOC/year
= 12.6 tons-VOC/year

Cost Effectiveness

Cost Effectiveness = Total Annual Cost ÷ Annual Emission Reductions

Cost Effectiveness = $515,011/year ÷ 12.6 tons-VOC/year
= $40,874/ton-VOC

The analysis demonstrates that the annualized purchase and installation cost of the ductwork alone results in a cost effectiveness which exceeds the District's Guideline, of $17,500/ton-VOC. Therefore this option is not cost-effective and will not be considered for this project.

Option 2 - Collection of VOCs and control by carbon adsorption (95% collection and control):

Emission Reductions

Annual Emission Reduction = Storage Emissions x 0.95
= 25,759 lb-VOC/year x 0.0.95
= 24,471 lb-VOC/year
= 12.2 tons-VOC/year

Cost Effectiveness

Cost Effectiveness = Total Annual Cost ÷ Annual Emission Reductions

Cost Effectiveness = $515,011/year ÷ 12.2 tons-VOC/year
= $42,214/ton-VOC

The analysis demonstrates that the annualized purchase and installation cost of the ductwork alone results in a cost effectiveness which exceeds the District's Guideline, of $17,500/ton-VOC. Therefore this option is not cost-effective and will not be considered for this project.

Option 3 - Collection of VOCs and control by absorption/scrubber (90% collection & control):

Emission Reductions

The District's BACT Guideline identifies an overall collection and control efficiency of 90% for absorption systems.

Annual Emission Reduction = Uncontrolled Fermentation Emissions x 0.9
= 25,759 lb-VOC/year x 0.9
= 23,183 lb-VOC/year
= 11.6 tons-VOC/year

Cost Effectiveness

Cost Effectiveness = Total Annual Cost ÷ Annual Emission Reductions

Cost Effectiveness = $515,011/year ÷ 11.6 tons-VOC/year
= $44,398/ton-VOC

The analysis demonstrates that the annualized purchase and installation cost of the ductwork alone results in a cost effectiveness which exceeds the District's Guideline, of $17,500/ton-VOC. Therefore this option is not cost-effective and will not be considered for this project.

Option 4 - Capture of VOCs and condensation (70% collection & control):

Emission Reductions

EcoPAS has indicated the PAS unit is capable of achieving a capture and control efficiency of 90%. However, the District's current BACT Guideline identifies a combined capture and control efficiency of 70% for condensation technology. The capture and control efficiency of 70% will be used in this analysis.

Annual Emission Reduction = Uncontrolled Storage Emissions x 0.7
= 25,759 lb-VOC/year x 0.7
= 18,031 lb-VOC/year
= 9.0 tons-VOC/year

Cost Effectiveness

Cost Effectiveness = Total Annual Cost ÷ Annual Emission Reductions

Cost Effectiveness = $515,011year ÷ 9.0 tons-VOC/year
= $57,223/ton-VOC

The analysis demonstrates that the annualized purchase and installation cost of the ductwork alone results in a cost effectiveness which exceeds the District's Guideline, of $17,500/ton-VOC. Therefore this option is not cost-effective and will not be considered for this project.

Option 5 - **Insulation or Equivalent, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum allowable working pressure of the tank; "gas-tight" tank operation; and continuous storage temperature not exceeding 75 degrees F, achieved within 60 days of completion of Fermentation (temperature requirement for wine only)**

The only remaining control option in step 3 above has been deemed AIP for this class and category of source and per the District BACT policy is required regardless of the cost. Therefore, a cost effectiveness analysis is not required.

Step 5 – Select BACT

All identified feasible options with control efficiencies higher than the option proposed by the facility have been shown to not be cost effective. The facility has proposed Option 5, which is:

For Wine and Distilled Spirits

Insulation or Equivalent, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum allowable working pressure of the tank; "gas-tight" tank operation.

For Wine Only

A continuous storage temperature not exceeding 75 degrees F, achieved within 60 days of completion of fermentation.

APPENDIX V
Quarterly Net Emissions Change

Quarterly Net Emissions Change (QNEC)

The Quarterly Net Emissions Change is used to complete the emission profile screen for the District's PAS database. The QNEC shall be calculated as follows:

$QNEC_{SLC} = PE2_{SLC} - PE1_{SLC}$, where:

$QNEC_{SLC}$ = Quarterly Net Emissions Change for units covered by the SLC.
$PE2_{SLC}$ = PE2 for all units covered by the SLC.
$PE1_{SLC}$ = PE1 for all units covered by the SLC.

Since $PE2_{SLC} = PE1_{SLC}$, the QNEC is equal to zero for this project.

APPENDIX VI
Compliance Certification

San Joaquin Valley
Unified Air Pollution Control District

HEALTHY AIR LIVING

TITLE V MODIFICATION - COMPLIANCE CERTIFICATION FORM

I. TYPE OF PERMIT ACTION (Check appropriate box)

[x] SIGNIFICANT PERMIT MODIFICATION
[ ] MINOR PERMIT MODIFICATION
[ ] ADMINISTRATIVE AMENDMENT

COMPANY NAME: Sutter Home Winery	FACILITY ID: N- 7855
1. Type of Organization:[x] Corporation [ ] Sole Ownership [ ] Government [ ] Partnership [ ] Utility	
2. Owner's Name: Sutter Home Winery	
3. Agent to the Owner:	

II. COMPLIANCE CERTIFICATION (Read each statement carefully and initial **applicable** circles for confirmation):

TEW Based on information and belief formed after reasonable inquiry, the equipment identified in this application will continue to comply with the applicable federal requirement(s).

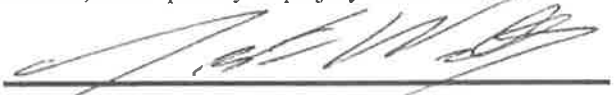
TEW Based on information and belief formed after reasonable inquiry, the equipment identified in this application will comply with applicable federal requirement(s) that will become effective during the permit term, on a timely basis.

TEW Corrected information will be provided to the District when I become aware that incorrect or incomplete information has been submitted.

TEW Based on information and belief formed after reasonable inquiry, information and statements in the submitted application package, including all accompanying reports, and required certifications are true, accurate, and complete.

TEW For minor modifications, this application meets the criteria for use of minor permit modification procedures pursuant to District Rule 2520.

I declare, under penalty of perjury under the laws of the state of California, that the forgoing is correct and true:



Signature of Responsible Official

4/11/2017

Date

Ted Wells

Name of Responsible Official (please print)

Environmental Compliance Engineering Manager

Title of Responsible Official (please print)

APPENDIX VII
Comparison Sheet Ducting/Piping Costs

Ducting/Piping Cost Comparison

Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	28"
Eichleay - Ducting/Piping Only $/Foot	--	--	--	$23.17	$38.59	$54.00	$62.00	$65.50	$69.00	$86.00	$92.00	$99.00	$106.00	$119.00
Eichleay - Ducting/Piping Only $/Foot Including 21.93% for Inflation	--	--	--	$28.25	$47.05	$65.84	$75.60	$79.86	$84.13	$104.86	$112.18	$120.71	$129.25	$145.10
Average of District Cool Survey in $/Foot	$15.49	$30.85	$27.87	$44.13	$37.50	$33.13	$93.75	$161.70	$216.50	$169.02	$308.40	--	$193.89	--

Ducting/Piping Costs based on Eichleay Report

Note: Minimum of 6" Diameter for Structural Support														
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	28"
Ducting/Piping Only $/Foot	--	--	--	$23.17	$38.59	$54.00	$62.00	$65.50	$69.00	$86.00	$92.00	$99.00	$106.00	$119.00
Ducting + Fittings, Bolt Up, Handling, & Install $/Foot	--	--	--	$62.17	$103.25	$144.33	$143.83	$174.17	$204.52	$251.38	$309.38	$306.44	$397.67	$476.73
Ducting + Fittings, Bolt Up, Handling, & Install $/Foot	--	--	--	$62.17	$103.25	$144.33	$143.83	$174.17	$204.52	$251.38	$309.38	$306.44	$397.67	$476.73

Supplier: Grainger (http://www.grainger.com) **Location: Fresno, CA and Ceres, CA**

Schedule 10													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price ($)	$229.50	$307.76	$587.50	--	--	--	--		--	--	--	--	--
Length (feet)	10	10	10	--	--	--	--		--	--	--	--	--
Price/Foot ($)	$22.95	$30.70	$58.75	--	--	--	--		--	--	--	--	--

Supplier: Stockton Pipe and & Supply Inc (http://www.stocktonpipe.net) **Location: Stockton, CA**

Note: Sizes over 12" Diameter need to be ordered from Mill													
0.109" thickness tube or Schedule 10 Pipe													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price ($)	--	--	--	--	--	$700.00	$840.00	--	--	--	--	--	$3,159.60
Length (feet)	--	--	--	--	--	20	20	--	--	--	--	--	20
Price/Foot ($)	--	--	--	--	--	$35.00	$42.00	--	--	--	--	--	$157.98

Supplier: Valley Iron Inc (http://www.stocktonpipe.net) **Location: Fresno, CA**

Note: Sch 10 T-304 20'													
Schedule 10 Pipe													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Length (feet)	--	--	20	20	20	20	--	--	--	--	--	--	--
Price/Foot ($)	--	--	$10.75	$16.00	$26.00	$33.90	--	--	--	--	--	--	--

Supplier: Del Paso Pipe & Steel Inc. (http://www.delpasopipeandsteel.com/) **Location: Sacramento, CA**

Schedule 5/10 Pipe:													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price Quote: $0/lb												--	
Estimated Price/Foot	--	--	--	--	--	--	$217.00	$250.00	$286.00	$322.00	$432.00	--	--
												--	

Supplier: Hayward Pipe & Supply Co. Inc (http://www.haywardpipe.com/) **Location: Hayward, CA**

Note: large diamter pipe ships from Texas, FREIGHT NOT QUOTED - Additional Shipping Costs apply													
Schedule 10 Pipe													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price ($)	--	--	--	--	--	--	$1,540.00	$2,200.00	$2,940.00	$3,276.00	$3,696.00	--	--
Length (feet)	--	--	--	--	--	--	20	20	20	20	20	--	--
Price/Foot ($)	--	--	--	--	--	--	$77.00	$110.40	$147.00	$163.80	$184.80	--	--

Supplier: OnlineMetals.com (http://www.onlinemetals.com/) **Location: Nearest Warehouse - Los Angeles, CA**

Schedule 10 Pipe													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price ($)	$70.28	$100.97	$160.34	$288.00	$520.00	--	--	--	--	--	--	--	--
Length (feet)	8	8	8	8	8	--	--	--	--	--	--	--	--
Price/Foot ($)	$9.78	$13.62	$20.04	$36.00	$65.00	--	--	--	--	--	--	--	--
Welded Stainless Tube 304/304L (2" OD, 0.12" Wall, 3" OD, 0.12" Wall, 6" 0.12")													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price ($)	$109.88	$321.34	--	$628.16	--	--	--	--	--	--	--	--	--
Length (feet)	8	8	--	8	--	--	--	--	--	--	--	--	--
Price/Foot ($)	$13.73	$40.17	--	$78.52	--	--	--	--	--	--	--	--	--

Supplier: Lone Star Supply Co **Location: Dickinson, TX**

Note: Additional shipping costs													
Schedule 10 Welded Pipe													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price/Foot ($)	--	--	$16.45	$19.80	$21.50	$30.50	$39.00	--	--	$61.25	--	--	$230.00
												--	

Supplier: Global Technology and Engineering **Location: Excelsior Springs, MD**

Note: Additional shipping Costs													
11 Gauge Tubing													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price ($)	--	--	$226.50	$487.40	--	--	--	--	--	--	--	--	--
Length (feet)	--	--	7	7	--	--	--	--	--	--	--	--	--
Price/Foot ($)	--	--	$32.37	$69.63	--	--	--	--	--	--	--	--	--

All suppliers	$30.85	$44.13	70%	
Only suppliers that have both 3" and 6"	$30.85	$57.28	54%	33.50034