Monterey Bay Air Resources District
Serving Monterey, San Benito, and Santa Cruz Counties

24580 Silver Cloud Court
Monterey, CA 93940
PHONE: (831) 647-9411 • FAX: (831) 647-8501

NOTICE PRELIMINARY DECISION OF PART 4, & PART 5, *OFFSETS,* OF DISTRICT RULE 207, *REVIEW OF NEW OR MODIFIED SOURCES (NSR)*

Pursuant to District Rule 207, Section 6.9, the Monterey Bay Air Resources District (MBARD) solicits written comments to the preliminary decision to approve the issuance of Authority to Construct (ATC) MOD-23-00104 to Constellation Brands U.S. Operations, Inc. dba Gonzales Winery (Gonzales Winery) for the modification of distillation equipment with storage tanks, which operates under permit to operate (PTO) GNR-0018339. The equipment is located at 800 South Alta Street in Gonzales. The modification is for the installation of a new 12,000-gallon insulated ethanol storage tank.

MBARD Rule 207, *Review or New of Modified Sources (NSR)* shall apply to all new stationary sources and all modifications to existing stationary sources which, after construction or modification, emit or have the potential to emit any affected pollutants. Section 2.33.1 defines a modification to be any physical change, change in method of operation of or addition to any existing stationary source that would result in an actual or potential increase from any permit unit or sum of permit units under consideration as a result of the proposed modification. The emission increase analysis as demonstrated in MBARD's Evaluation Report demonstrates that the proposed modification is subject to NSR.

The facility-wide volatile organic compound (VOC) emissions are greater than or equal to the Offset threshold limits listed for Sections 4.2 and 5.3. As demonstrated in the District's Evaluation Report, the ethanol storage tank installation project meets the requirements of Part 4 and Part 5 of Rule 207. Hence, MBARD's preliminary decision to approve this project is being proposed because the facility has the capability of complying with all applicable MBARD rules and regulations.

The Gonzales Winery's application and MBARD's Evaluation Report are available for public inspection at MBARD's office at 24580 Silver Cloud Court, Monterey, CA. A copy of the evaluation report can be found on MBARD's website at www.mbard.org.

The public has an opportunity to review and comment on the proposed project. Under special circumstances, MBARD may hold a public hearing. Written comments must be submitted to the address below and be postmarked by Sunday, May 5, 2024.

Monterey Bay
Air Resources District
24580 Silver Cloud Court
Monterey, CA 93940
(831) 647-9411
ajimenez@mbard.org
Attention: Armando Jimenez

MONTEREY BAY AIR RESOURCES DISTRICT
EVALUATION REPORT APPLICATION MOD-23-00104

24580 Silver Cloud Court
Monterey, CA 93940
Telephone: (831) 647-9411

Date: April 2024

APPLICATION RECEIVED FROM:

Constellation Brands U.S. Operations, Inc.
dba Gonzales Winery
P.O. Box 789
Gonzales, CA 93960

PLANT SITE LOCATION:

Address:	UTM Coordinates:	
800 South Alta Street	640153 m E	Latitude °N: 36.502192°
Gonzales, CA	4040790 m N	Longitude °E: -121.435024°

SIC No: 2084 (Wines, Brandy, and Brandy Spirits)
NAISC: 312130 (Wineries)
SCC No.: 30201120 (Ind. Processes, Food & Agriculture, Wines Brandy and Brandy Spirits, Raw Material Storage)

FACILITY CONTACT:

Name: Monica Belavic
Title: General Manager, Central Coast Wineries
Email: Monica.Belavic@cbrands.com
Phone: (831) 753-4521

APPLICATION PROCESSED BY:

Armando Jimenez, Air Quality Engineer

AUTHORIZED FOR RELEASE ON: April 5, 2024

COMMENTS MUST BE POSTMARKED BY: May 5, 2024

APPROVED FOR RELEASE BY:

Mary Giraudo
Mary Giraudo
Supervising Air Quality Engineer

April 4, 2024
Date

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PROPOSAL:

Constellation Brands U.S. Operations, Inc. dba Gonzales Winery (applicant or facility) has submitted a permit application for the modification of the distillation equipment with storage tanks located at 800 South Alta Street in Gonzales. The modification is for the installation of a new 12,000 gallon insulated ethanol storage tank. The facility has stated that the tank will provide additional ethanol storage capacity to support product segregation.

The proposed new tank is an existing 12,000-gallon stainless steel jacketed tank that is currently used for wine fermentation and storage and will be transferred from Constellations' Robert Mondavi Winery, located in Napa, California.

The applicant proposes to retain the same permitted annual throughput limit of 1,184,000 gallons per year (gal/yr), which is currently equally divided amongst the four existing ethanol storage tanks (Tanks No. 1073, 1074, 1075 and 2109). Condition 2 of permit to operate (PTO) GNR-0018339 limits each of the existing ethanol storage tanks to an annual throughput of 296,000 gal/yr. Accordingly, the facility has proposed an annual throughput limit for the new tank, and proposed revised annual throughput limits for the four existing tanks, to retain a total annual ethanol storage throughput limit of 1,184,000 gal/yr.

APPLICABLE RULES:

Rule 200: Permits Required
Rule 201: Sources Not Requiring Permits
Rule 207: Review of New and Modified Stationary Sources
Rule 218: Title V Operating Permits
Rule 221: Federal Prevention of Significant Deterioration
Rule 222: Federal Minor New Source Review
Rule 300: District Fees
Rule 400: Visible Emissions
Rule 402: Nuisance
Rule 417: Storage of Organic Liquids
Rule 436: Title V: General Prohibitory Rule
Rule 440: Mineral Processing Facilities
Rule 1000: Toxic Air Contaminants
CA Health & Safety Code, Section 42301.6 – Public Notice

EQUIPMENT DESCRIPTION:

The equipment description of the new unit is as follows:

MODIFICATION OF DISTILLATION EQUIPMENT WITH STORAGE TANKS:

Addition Of A New Insulated Ethanol Storage Tank With A Pressure Vacuum Relief Valve, Tank #2110, With A Capacity Of 12,000 Gallon Capacity. Existing Equipment Remains Unchanged As Follows:

Spinning Cone Colum (SCC) Distillation Closed System For Aroma Recovery And Ethanol Removal From Wines Consisting Of:

1. Flavourtech Spinning Cone Column, Model SCC10,000-2W-133, Consisting Of A Receiving Feed Tank, Two Spinning Cone Columns, Condenser, And Associated Equipment (Pumps, Heaters/Coolers And Heat Exchanger). System Receiving Bonded Wine From Wine Tanks, Recovered Aroma Discharged To Aroma Tank, Removed Ethanol Discharged To Ethanol Storage Tanks, And Processed Bonded Wined Returned To Wine Tanks.

2. Aroma Tank, Tank #: Tk 9030, With Capacity Of 500 Gallons. Tank Equipped With A Pressure/Vacuum Valve.

3. Five (5) High Proof Ethanol Holding Tanks Equipped, Each Equipped With A Pressure/Vacuum Valve. Tanks Include:
    a. Tank # TK 1073, With A Capacity Of 3,200 Gallons.
    b. Tank # TK 1074, With A Capacity Of 3,200 Gallons.
    c. Tank # TK 1075, With A Capacity Of 3,200 Gallons.
    d. Tank # TK 2109, With A Capacity Of 15,802 Gallons.
    e. Tank # TK 2110, With A Capacity of 12,000 Gallons.

EMISSIONS CALCULATIONS:

Spinning cone column distillation equipment with storage tanks emissions profile
The manufacturer of this equipment states that it is a closed system and that under normal operation of the equipment, all incoming liquid product is discharged from the machine in a liquid form. The machine is a closed system and does not emit vapors under normal operation. Thus, the emissions profile for the equipment are based on the working and breathing loss emissions from the storage tanks.

Existing (pre-project) potential to emit (PTE) emissions
Table 1 shows the tank description, including dimensions & the new proposed throughputs. As noted above, the total ethanol & aroma annual throughput remains the same.

Table 1. Existing ethanol (EtOH) and aroma tanks associated with spinning cone distillation.

Tank #	Tank description	Tank capacity (gal)	Tank height (ft)	Tank diameter (ft)	P/V setting	Permitted throughput (gal/yr)
Tk 1073	EtOH high proof tank	3,200	12.5	7	0.5 oz (0.03 psig)	296,000
Tk 1074	EtOH high proof tank	3,200	12.5	7	0.5 oz (0.03 psig)	296,000
Tk 1075	EtOH high proof tank	3,200	12.5	7	0.5 oz (0.03 psig)	296,000
Tk 2109	EtOH high proof tank	15,802	16.5	10.5	0.5 oz (0.03 psig)	296,000
Tk 9030	Aroma tank	500	5.33	4	0.5 oz (0.03 psig)	15,510
				Total ethanol annual throughput (gal/yr):		1,199,509

The working and breathing loss emissions from the tanks were estimated using EPA's software TANKS 4.0.9.d. The printout reports for the existing tanks are included in Attachment 1. Note that the emissions

were conservatively estimated assuming the tanks had 100% ethyl alcohol. Table 2 shows the VOC, ethyl alcohol, emissions from working and breathing losses.

Table 2. Pre-project PTE VOC emissions.

Tank Id #	Working losses (lb/yr)	Breathing losses (lb/yr)	Total emissions (lb/yr)[1]
Tk 1073	125.88	42.14	168.03
Tk 1074	125.88	42.14	168.03
Tk 1075	125.88	42.14	168.03
Tk 2109	236.90	115.69	352.59
Tk 9030	11.10	7.32	18.42
Total VOC emissions (lb/yr):			875.10
Total VOC emissions (ton/yr):			0.44
Total VOC emissions (lb/day):			2.40

[1] Total emissions as shown in the EPA Tanks 4.0.9.d printouts. Total emissions may be ± 0.01 lb/yr from the working & breathing losses.

Table 3 and Table 4 show the existing pre-project potential emissions broken down by quarter in pounds per quarter (lbs/qtr) and in tons per quarter (ton/qtr) respectively. The emissions are based on the storage tanks operating every day in each quarter, which are assessed to be 90 days for quarter 1, 91 days for quarter 2, 92 days for quarter 3, and 92 days for quarter 4.

Table 3. Pre-project PTE emissions in lbs/qtr.

Pollutant	Quarter 1 (lbs/qtr)	Quarter 2 (lbs/qtr)	Quarter 3 (lbs/qtr)	Quarter 4 (lbs/qtr)
VOC	216.00	218.40	220.80	220.80

[1] Example: Quarter 1 VOC = (2.40 lb/day) (90 day/Q1) = 216.0 lb/qtr 1.

Table 4. Pre-project PTE emissions in ton/qtr.

Pollutant	Quarter 1 (ton/qtr)	Quarter 2 (ton/qtr)	Quarter 3 (ton/qtr)	Quarter 4 (ton/qtr)
VOC	0.11	0.11	0.11	0.11

The average emission factor for the ethanol working and breathing losses emissions is estimated based on the annual emissions and the total ethanol annual throughput. The emission factor is estimated as follows:

$$EF_{VOC} = \frac{annual\ emissions, lb/yr}{annual\ EtOH\ throughput, gal/yr} = \frac{875.10\ lb/yr}{1{,}199{,}510\ gal/yr}\ x\ \frac{1{,}000\ gal}{kgal} = \frac{0.73\ lb}{kgal}$$

Proposed (post-project) new PTE emissions

Table 5 shows the tank description, including dimensions & the new proposed throughputs. As noted above, the total ethanol & aroma annual throughput remains the same.

Table 5. New proposed ethanol (EtOH) and aroma tanks associated with spinning cone distillation.

Tank #	Tank description	Tank capacity (gal)	Tank height (ft)	Tank diameter (ft)	P/V setting	Proposed throughput (gal/yr)
Tk 1073	EtOH high proof tank[1]	3,200	12.5	7	0.5 oz (0.03 psig)	101,299

Tank #	Tank description	Tank capacity (gal)	Tank height (ft)	Tank diameter (ft)	P/V setting	Proposed throughput (gal/yr)
Tk 1074	EtOH high proof tank[1]	3,200	12.5	7	0.5 oz (0.03 psig)	101,299
Tk 1075	EtOH high proof tank[1]	3,200	12.5	7	0.5 oz (0.03 psig)	101,299
Tk 2109	EtOH high proof tank[2]	15,802	16.5	10.5	0.5 oz (0.03 psig)	500,229
Tk 2110[1]	EtOH high proof tank	12,000	16.67	11.75	0.5 oz (0.03 psig)	379,873
Tk 9030	Aroma tank	500	5.33	4	0.5 oz (0.03 psig)	15,510
					Total ethanol annual throughput (gal/yr):	1,199,509

[1] Proposed new insulated tank.

The working and breathing loss emissions from the tanks were estimated using EPA's software TANKS 4.0.9.d. The printout reports for the post-project tanks are included in Attachment 2. Note that the emissions were conservatively estimated assuming the tanks had 100% ethyl alcohol. As noted in the Proposal section above, the new tank Tk 2110 will be insulated. The emissions will be estimated for an insulated tank as "controlled emissions" and will also be estimated as a non-insulated tank as "uncontrolled emissions." The uncontrolled annual emissions will be used in the Best Available Control Technology (BACT) analysis for Rule 207 *New Source Review*.

Post-project Uncontrolled PTE emissions
Table 6 shows the VOC, ethyl alcohol, uncontrolled annual emissions from working and breathing losses.

Table 6. Post-project Uncontrolled PTE VOC emissions.

Tank Id #	Working losses (lb/yr)	Breathing losses (lb/yr)	Total emissions (lb/yr)[1]
Tk 1073	81.07	42.14	123.22
Tk 1074	81.07	42.14	123.22
Tk 1075	81.07	42.14	123.22
Tk 2109	323.34	115.69	439.03
Tk 2110[2]	304.03	145.91	449.93
Tk 9030	11.10	7.32	18.42
		Total VOC emissions (lb/yr):	1,277.04
		Total VOC emissions (ton/yr):	0.64
		Total VOC emissions (lb/day):	3.50

[1] Total emissions as shown in the EPA Tanks 4.0.9.d printouts. Total emissions may be ± 0.01 lb/yr from the working & breathing losses.
[2] Tank 2110 modeled as a non-insulated tank.

The average emission factor for the ethanol working and breathing losses emissions is estimated based on the annual emissions and the total ethanol annual throughput. The emission factor is estimated as follows:

$$EF_{VOC} = \frac{annual\ emissions, lb/yr}{annual\ EtOH\ throughput, gal/yr} = \frac{1{,}277.04\ lb/yr}{1{,}199{,}509\ gal/yr}\ x\ \frac{1{,}000\ gal}{kgal} = \frac{1.06\ lb}{kgal}$$

Post-project Controlled PTE emissions
Table 7 shows the VOC, ethyl alcohol, controlled emissions from working and breathing losses.

Table 7. Post-project Controlled PTE VOC emissions.

Tank Id #	Working losses (lb/yr)	Breathing losses (lb/yr)	Total emissions (lb/yr)[1]
Tk 1073	81.07	42.14	123.22
Tk 1074	81.07	42.14	123.22
Tk 1075	81.07	42.14	123.22
Tk 2109	323.34	115.69	439.03
Tk 2110[2]	249.17	0.00	249.17
Tk 9030	11.10	7.32	18.42
		Total VOC emissions (lb/yr):	1,076.28
		Total VOC emissions (ton/yr):	0.54
		Total VOC emissions (lb/day):	2.95

[1] Total emissions as shown in the EPA Tanks 4.0.9.d printouts. Total emissions may be ± 0.01 lb/yr from the working & breathing losses.
[2] Tank 2110 modeled as an insulated tank. Per EPA AP42 Chapter 7, Section 7.1 for Organic Liquid Storage Tanks (2018), for insulated tanks have not generation of breathing loss from ambient diurnal temperature cycle[1].

Table 8 and Table 9 show the new post-project potential emissions broken down by quarter in pounds per quarter (lbs/qtr) and in tons per quarter (ton/qtr) respectively. The emissions are based on the tank operating every day in each quarter, which is assessed to be 90 days for quarter 1, 91 days for quarter 2, 92 days for quarter 3, and 92 days for quarter 4.

Table 8. Post-project Controlled PTE emissions in lbs/qtr.

Pollutant	Quarter 1 (lbs/qtr)	Quarter 2 (lbs/qtr)	Quarter 3 (lbs/qtr)	Quarter 4 (lbs/qtr)
VOC	265.50	268.48	271.40	271.40

[1] Example: Quarter 1 VOC = (2.95 lb/day) (90 day/Q1) = 265.50 lb/qtr 1.

Table 9. Post-project Controlled PTE emissions in ton/qtr.

Pollutant	Quarter 1 (ton/qtr)	Quarter 2 (ton/qtr)	Quarter 3 (ton/qtr)	Quarter 4 (ton/qtr)
VOC	0.13	0.13	0.14	0.14

The average emission factor for the ethanol working and breathing emission losses is estimated based on the annual emissions and the total ethanol annual throughput. The emission factor is estimated as follows:

$$EF_{VOC} = \frac{annual\ emissions, lb/yr}{annual\ EtOH\ throughput, gal/yr} = \frac{1{,}076.28\ lb/yr}{1{,}199{,}509\ gal/yr}\ x\ \frac{1{,}000\ gal}{kgal} = \frac{0.90\ lb}{kgal}$$

New (post-project) vs existing (pre-project) PTE emissions
Table 10 shows the new post-project potential emissions, as shown in Table 8, minus the pre-project potential emissions, as shown in Table 3, in lbs/qtr. The table shows that there is an increase in potential emissions for VOC.

[1] Documentation for Proposed Changes to AP-42 Chapter 7 Section 7.1 – Organic Liquid Storage Tanks 2018. https://www3.epa.gov/ttnchie1/ap42/ch07/draft/AP42_Chapter_7_section_7-1_revisions_summary.pdf.

Table 10. Post-project – Pre-project potential to emit emissions in lbs/qtr.

Pollutant	Quarter 1 (lbs/qtr)[1]	Quarter 2 (lbs/qtr)[1]	Quarter 3 (lbs/qtr)[1]	Quarter 4 (lbs/qtr)[1]
VOC	49.50	50.05	50.60	50.60

[1] The post-project PTE emissions are shown in Table 8 in pounds per quarter. The pre-project PTE emissions are shown in Table 3 in pounds per quarter. Example for Quarter 1: (265.50 lb/qtr 1) – (216.00 lb/qtr 1) = 49.50 lb/qtr 1.

Actual historic emissions (pre-project)

The facility submitted the actual throughput data for the existing equipment for the period of 2021-2023.

Table 11, Table 12, Table 13, and Table 14 showed the past throughput data for tanks 1073, 1074, 1075 and 2109 broken down by month. No throughput data was reported for tank 9030.

Table 11. Tank T1073 historical throughput.

Year	2021 (gal)	2022 (gal)	2023 (gal)	Average (gal)
January	3,388.00	1,777.00	3,015.00	2,726.67
February	1.00	0.00	0.00	0.33
March	0.00	3,371.00	4,996.00	2,789.00
April	0.00	6,731.00	0.00	2,243.67
May	0.00	1,371.00	0.00	457.00
June	0.00	0.00	523.00	174.33
July	2,177.00	1,412.00	0.00	1,196.33
August	4,269.00	0.00	5,782.00	3,350.33
September	0.00	0.00	0.00	0.00
October	11.00	4,993.00	0.00	1,668.00
November	0.00	3,090.00	0.00	1,030.00
December	1,897.00	0.00	0.00	632.33
Total	11,743.00	22,745.00	14,316.00	16,268.00

Table 12. Tank T1074 historical throughput.

Year	2021 (gal)	2022 (gal)	2023 (gal)	Average (gal)
January	0.00	1,904.00	1,077.00	993.67
February	2,456.00	0.00	1,110.00	1,188.67
March	0.00	2,547.00	1,875.00	1,474.00
April	0.00	3,166.00	0.00	1,055.33
May	2,934.00	2,503.00	0.00	1,812.33
June	0.00	0.00	2,254.00	751.33
July	336.00	1,136.00	0.00	490.67
August	1,569.00	467.00	2,604.00	1,546.67
September	0.00	0.00	0.00	0.00
October	0.00	4,074.00	0.00	1,358.00
November	2,476.00	2,747.00	0.00	1,741.00
December	955.00	0.00	0.00	318.33
Total	10,726.00	18,544.00	8,920.00	12,730.00

Table 13. Tank T1075 historical throughput.

Year	2021 (gal)	2022 (gal)	2023 (gal)	Average (gal)
January	954.00	4,486.00	2,987.00	2,809.00
February	2,941.00	1,143.00	2,880.00	2,321.33

Year	2021 (gal)	2022 (gal)	2023 (gal)	Average (gal)
March	0.00	1,466.00	0.00	488.67
April	0.00	2,739.00	2,385.00	1,708.00
May	2,409.00	6,049.00	468.00	2,975.33
June	581.00	702.00	0.00	427.67
July	0.00	0.00	0.00	0.00
August	2,733.00	349.00	4,769.00	2,617.00
September	2,601.00	0.00	62.00	887.67
October	0.00	2,050.00	0.00	683.33
November	3,138.00	0.00	0.00	1,046.00
December	0.00	0.00	0.00	0.00
Total	15,357.00	18,984.00	13,551.00	15,964.00

Table 14. Tank T2109 historical throughput.

Year	2021 (gal)	2022 (gal)	2023 (gal)	Average (gal)
January	4,073.00	1,635.00	0.00	1,902.67
February	252.00	8,941.00	6,415.00	5,202.67
March	5,720.00	7,671.00	5,868.00	6,419.67
April	0.00	5,296.00	3,817.00	3,037.67
May	351.00	0.00	2,464.00	938.33
June	5,295.00	3,752.00	10,475.00	6,507.33
July	6,815.00	0.00	3,552.00	3,455.67
August	1,424.00	7,305.00	10,934.00	6,554.33
September	1,494.00	3,462.00	12,604.00	5,853.33
October	2,438.00	4,044.00	0.00	2,160.67
November	13,073.00	16,338.00	0.00	9,803.67
December	11,558.00	300.00	6,432.00	6,096.67
Total	52,493.00	58,744.00	62,561.00	57,932.67

The average throughput data for each tank was used to estimate the actual historic emissions using EPA's software TANKS 4.0.9.d. The printout reports for the existing actual historic tank throughputs are included in Attachment 3. Table 15, Table 16, and Table 17 show the actual historic emissions for the existing storage tanks.

Table 15. Actual historic emissions.

Month	Tk 1073 AHE (lb)	Tk 1074 AHE (lb)	Tk 1075 AHE (lb)	Tk 2109 AHE (lb)	Total (lb)[1]
January	4.26	3.09	4.31	7.97	19.62
February	2.48	3.33	4.13	10.54	20.48
March	5.25	4.27	3.54	13.52	26.59
April	5.68	4.74	5.26	13.12	28.80
May	4.73	5.88	6.86	12.68	30.15
June	4.75	5.27	4.98	18.43	33.44
July	6.08	5.42	4.96	16.75	33.21
August	7.71	6.03	7.03	18.62	39.39
September	3.95	3.95	4.74	16.01	28.67
October	4.94	4.69	4.13	11.56	25.32
November	3.46	3.98	3.47	14.63	25.54
December	2.83	2.61	2.40	10.73	18.57
Total	56.13	53.26	55.82	164.56	329.77

[1] Total emissions as shown in the EPA Tanks 4.0.9.d printouts. Total emissions may be ± 0.01 lb/yr.

Table 16. Actual historic emissions (pre-project) in lbs/qtr.

Pollutant	Quarter 1 (lbs/qtr)	Quarter 2 (lbs/qtr)	Quarter 3 (lbs/qtr)	Quarter 4 (lbs/qtr)
VOC	66.69	92.38	101.27	69.43

Table 17. Actual historical emissions (pre-project) in ton/qtr.

Pollutant	Quarter 1 (ton/qtr)	Quarter 2 (ton/qtr)	Quarter 3 (ton/qtr)	Quarter 4 (ton/qtr)
VOC	0.03	0.05	0.05	0.03

RULE COMPLIANCE:

The following Monterey Bay Air Resources District (MBARD) rules apply to the operation as specified:

Rule 200 – Permits Required
The purpose of this Rule is to identify when MBARD permits are issued. The provisions of this Rule shall apply to any person who builds, erects, alters, or replaces any article, machine, equipment or other contrivance which may cause the issuance of air contaminants or the use of which may eliminate or reduce or control the issuance of air contaminants.

Pursuant to Section 3.1, person shall build, erect, alter, or replace any article, machine, equipment or other contrivance which may cause the issuance of air contaminants or the use of which may eliminate or reduce or control the issuance of air contaminants unless the facility owner or operator has obtained a separate written Authority to Construct for each permit unit from the Air Pollution Control Officer. An Authority to Construct shall remain in effect until the Permit to Operate the equipment for which the application was filed is granted or denied or the application is cancelled. Exceptions to MBARD Rule 200 are identified in MBARD Rule 201.

Rule 207 – Review of New of Modified Sources (as adopted on 4/20/11)
This Rule provides for the review of new and modified stationary air pollution sources to meet requirements for the review of new and modified stationary sources (NSR) and for the Prevention of Significant Deterioration (PSD), under the provisions of the federal Clean Air Act; and requirements for NSR under the provisions of the California Clean Air Act. The intent of this Rule is to ensure that the most stringent requirements of these programs shall be applied.

This Rule shall apply to all new stationary sources and all modifications to existing stationary sources which, after construction or modification, emit or have the potential to emit any affected pollutants. The proposed project is subject to the requirements of this Rule.

Federal Best Available Control Technology (BACT) Analysis:
Pursuant to Section 4.1.1, an applicant shall apply BACT to a new stationary source or modification of an existing source, which has the potential to emit greater than or equal to any one of the affected pollutant levels listed in Table 4.1.1 or a modification of an existing stationary source which has the potential to result in a new emissions increase, as defined in Section 2.37, occurring after October 20, 2010 for $PM_{2.5}$ or after August 19, 1983 for PM_{10} or after July 15, 1976 for any other affected pollutant.

Table 18 shows the controlled emissions from the proposed project, the facility-wide new emissions and

the Federal BACT thresholds of Table 4.1.1.

Table 18. New Emission Increases – Federal BACT Analysis

Application no./Equipment Description/Installation Date:	NO_x (lb/day)	VOC (lb/day)	CO (lb/day)	SO_x (lb/day)	PM[1] (lb/day)	PM_{10}[1] (lb/day)	$PM_{2.5}$[1,2] (lb/day)
MOD-23-00104/PTO GNR-0018339 Distillation equipment with storage tanks		2.95					
15666 Boiler #1 (6.277 MMBtu/hr) Installed 1981	14.35	0.79	12.05	0.09	1.09	N/A	N/A
15667 Boiler #2 (6.277 MMBtu/hr) Installed 1981	14.35	0.79	12.05	0.09	1.09	N/A	N/A
15668 Boiler #3 (12.554 MMBtu/hr) Installed 1985	28.69	1.58	24.10	0.17	2.18	2.17	N/A
15669 Boiler #4 (2.65 MMBtu/hr) Installed 1994	6.06	0.33	5.09	0.04	0.46	0.46	N/A
15671 Lab equipment with ventilation system Installed 2000		0.38					
15824 Emergency IC eng. fire pump (196 hp) Installed 1975[3]	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15825 Emergency IC eng. fire pump (134 hp) Installed 1975[3]	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GNR-0017748 Fermentation & Storage Initial Permit issued in 1996 with pre-1976 operations[4]	--	176.00	--	--	--	--	--
GNR-0017749 Barrel storage/aging Initial permit 2016	--	326.20	--	--	--	--	--
GNR-0018338 Two-stage boiler (3.3584 MMBtu/hr total) Installed 2009	3.50	0.52	7.91	0.06	0.72	0.71	N/A
PTO-22-00043 Emergency engine-gen set (103 HP) Installed 2022	0.54	0.87	4.85	0.02	0.26	0.26	0.26
Total:	67.49	510.41	66.05	0.47	5.80	3.60	0.26
Table 4.1.1 Federal BACT Threshold:	150	150	550	150	150	82	54.79

[1] PM_{10} and $PM_{2.5}$ fractions estimated using CARB's CEIDARS particulate matter size profile database (updated 6/9/23). For IC engine-diesel (profile #116): PM_{10} = 0.96 PM & $PM_{2.5}$ = 0.937 PM]. For IC engine-gas (profile #123): PM_{10} = 0.994 PM & $PM_{2.5}$ = 0.992 PM. For gas-fired boilers (profile #1101): PM = PM_{10} = $PM_{2.5}$.

[2] Includes only $PM_{2.5}$ emission occurring after October 20, 2010, and PM_{10} emissions occurring after August 19, 1983. LAARS two-stage boiler was installed around 2009, boiler plate lists a manufactured date of 6/27/2006.

[3] Equipment predates the NSR applicability date of July 15, 1976.

[4] Fermentation operations have been conducted at this facility prior to July 15, 1976. Therefore, the emission increases in Table **18** only reflect increases in fermentation operation after July 15, 1976. Documentation of these emission increases is reported in applications 12761, 14950, and 15509, and summarized in application GNR-017710. Application GNR-017710 was required to update the facility emissions using the more current CARB emission factors from the EPA AP-42 emission factors.

Table 18 shows that the new emissions, as defined in Section 2.37, exceed the BACT thresholds of Section 4.1.1 for VOCs. The proposed addition of the ethanol storage tank for the distillation equipment triggers

BACT requirements.

The applicant is proposing to install a new insulated tank with a pressure and vacuum relief valve (PVRV). A search of California Air District's BACT clearinghouses and databases for distillation storage tanks found a BACT guideline from the San Joaquin Valley Air Pollution Control District (SJVAPCD).

SJVAPCD has created BACT Guideline 5.4.15 (5/6/2020) for Distilled Spirits Storage Tanks. Table 19 shows the control technologies listed in SJVAPCD's BACT Guideline 5.4.14.

Table 19. SJVAPCD BACT Guideline 5.4.15 for distilled spirits storage tanks (5/6/2020).

Pollutant	Achieved in practice or in the SIP	Technologically Feasible
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 VOC's and thermal or catalytic oxidation or equivalent (99% control)
		2. Capture of VOC's and carbon adsorption or equivalent (95% control)
		3. Capture of VOCs and absorption or equivalent (90% control)
		4. Refrigerated Storage (70% control)

The applicant has submitted a cost effectiveness analysis that shows that the technologically feasible options are not cost effective technologies. Attachment 4 includes a copy of the BACT cost effectiveness analysis. Thus, the proposed project will need to meet the achieved in practice requirements of BACT guidelines 5.4.15. The proposed insulated storage tank with PVRV valve meets the BACT requirements.

California BACT analysis

Pursuant to Section 5.2, BACT shall be required for any new or modified permit unit with a potential to emit 25 pounds per day or more of VOCs or NO_x. Table 20 shows that the proposed project's uncontrolled emissions do not trigger the CA BACT thresholds.

Table 20. California BACT determination.

Pollutant	BACT threshold (lb/day)	Project uncontrolled emissions (lb/day)	BACT triggered?
NO_x	25	-	No
VOC[1]	25	3.50	No

[1] VOC project uncontrolled emissions from Table 6.

Federal Offsets analysis

Section 4.2 requires that offsets be provided from a new or modified stationary source with a net emissions increase, as defined in Section 2.36, equal to or exceeding the offset emissions thresholds. Table 21 shows the emissions thresholds for offsets of Section 4.2.

Table 21. Emissions thresholds for offsets.

Compound	NO_x	VOC	CO	SO_x	PM	PM_{10}
Threshold limit (lb/day)	150	150	550	150	150	82

Table 22 shows the net emissions increase for the facility including the proposed project under application MOD-23-00104.

Table 22. Net Emissions Increases – Federal Offsetting Analysis.

Application no./Equipment Description/Installation Date:	NO_x (lb/day)	VOC (lb/day)	CO (lb/day)	SO_x (lb/day)	PM[1] (lb/day)	PM_{10}[1,2] (lb/day)
MOD-23-00104/PTO GNR-0018339 Distillation equipment with storage tanks		2.95				
15666 Boiler #1 (6.277 MMBtu/hr) Installed 1981	14.35	0.79	12.05	0.09	1.09	N/A
15667 Boiler #2 (6.277 MMBtu/hr) Installed 1981	14.35	0.79	12.05	0.09	1.09	N/A
15668 Boiler #3 (12.554 MMBtu/hr) Installed 1985	28.69	1.58	24.10	0.17	2.18	2.17
15669 Boiler #4 (2.65 MMBtu/hr) Installed 1994	6.06	0.33	5.09	0.04	0.46	0.46
15671 Lab equipment with ventilation system Installed 2000		0.38				
15824 Emergency IC eng. fire pump (196 hp) Installed 1975[3,5]						
15825 Emergency IC eng. fire pump (134 hp) Installed 1975[3,5]						
GNR-0017748 Fermentation & Storage Initial Permit issued in 1996 with pre-1976 operations[4]		176.00				
GNR-0017749 Barrel storage/aging Initial permit 2016		326.20				
GNR-0018338 Two-stage boiler (3.3584 MMBtu/hr total) Installed 2009	3.50	0.52	7.91	0.06	0.72	0.71
PTO-22-00043 Emergency engine-gen set (103 HP) Installed 2022[5]						
Total:	66.95	509.54	61.20	0.45	5.54	3.34
Table 4.2.2 Offset Threshold:	150	150	550	150	150	82

[1] PM_{10} and $PM_{2.5}$ fractions estimated using CARB's CEIDARS particulate matter size profile database (updated 6/9/23). For gas-fired boilers (profile #1101): PM = PM_{10} = $PM_{2.5}$.

[2] Includes only PM_{10} emissions occurring after August 19, 1983.

[3] Equipment predates the NSR applicability date of July 15, 1976.

[4] Fermentation operations have been conducted at this facility prior to July 15, 1976. Therefore, the emission increases in Table **22** only reflect increases in fermentation operation after July 15, 1976. Documentation of these emission increases is reported in applications 12761, 14950, and 15509, and summarized in application GNR-017710. Application GNR-017710 was required to update the facility emissions using the more current CARB emission factors from the EPA AP-42 emission factors.

[5] Pursuant to Rule 207, Section 1.3.3, the offset requirements of Sections 4.2 and 5.3 shall not apply to any emergency internal combustion engine that is either only used for emergency power when normal power line service fails, or are used only for the emergency pumping of water, and are operated less than 60 hours per year of testing exercise.

As shown in Table 22, the facility exceeds the offset thresholds for VOCs of Section 4.2 and the project is subject to the offset requirements of Section 4.2.

Per Section 4.2.5, the amount of offsets obtained shall be at least equal to the net emissions increase from the proposed new source or modification. The affected emission units associated with the addition of the

new storage tank. Section 7.4.1 describes how the net emissions increase is to be calculated. Emissions from the modified source shall be based on potential to emit and emissions profiles from an existing source shall be based on the actual operating conditions. In addition, Section 4.2.4 specifies that emissions profiles shall be based on a quarterly basis.

Table 23 shows the comparison of the VOC emissions profile for the proposed project, $PTE_{post\text{-}project}$, and the actual historical emissions of the existing source, $AHE_{pre\text{-}project}$.

Table 23. Federal offset determination $PTE_{post\text{-}project} - AHE_{pre\text{-}project}$.

Federal Quarterly Profiles	Quarter 1 (tons/qtr)	Quarter 2 (tons/qtr)	Quarter 3 (tons/qtr)	Quarter 4 (tons/qtr)
PTE Post-Project Emissions[1] (Table 9):				
Storage tanks MOD-23-00104	0.13	0.13	0.14	0.14
AHE Pre-Project Emissions[2] (Table 17):				
Storage tanks GNR-0018339	0.03	0.05	0.05	0.03
$PTE_{post\text{-}project} - AHE_{pre\text{-}project}$:	0.10	0.08	0.09	0.11

[1] The post-project controlled PTE emissions are shown in Table 9 in tons per quarter.
[2] The pre-project AHE emissions are shown in Table 17 in tons per quarter.

Table 23 shows that the VOC emission increases from the proposed modification results in an increase of 0.10 tons for quarter 1, 0.08 tons for quarter 2, 0.09 for quarter 3 and 0.11 for quarter 4. The quarterly VOC emission increases must be offset by emission reductions. MBARD's Policy for Rounding, dated April 18, 2017, for determining the amount of offsets required in accordance with MBARD Rule 207 is to round up to the tenths place and to the nearest whole number. For example, the given number of decimal places is 0 so a quarterly offset amount of 0.11 tons rounds to 0. Thus, for this project, no offsets are required.

California Offsets analysis

Per Section 5.3.1, any modified source with a potential to emit 137 pounds per day or more of VOCs or NO_x shall be required to provide offsets. As shown in Table 22, the facility has the potential to emit more than 137 pounds per of VOCs. Accordingly, the facility is subject to offsets per the California Clean Air Act (CCAA).

Per Section 5.3.4, the amount of offsets required shall be equal to the difference between the modified source and the existing source. Per Section 5.4, emission profiles for new sources, existing sources and modified sources are based upon potential to emit, as described in Section 7.1. In addition, Section 5.3.2 states that offsets shall be determined on a quarterly basis.

Table 24 shows the comparison of the VOC emissions profile for the proposed project, $PTE_{post\text{-}project}$, and the PTE emissions of the existing source, $PTE_{pre\text{-}project}$.

Table 24. California offset determination $PTE_{post\text{-}project} - PTE_{pre\text{-}project}$.

California Quarterly Profiles	Quarter 1 (tons/qtr)	Quarter 2 (tons/qtr)	Quarter 3 (tons/qtr)	Quarter 4 (tons/qtr)
PTE Post-Project Emissions[1] (Table 9):				
Storage tanks MOD-23-00104	0.13	0.13	0.14	0.14
PTE Pre-Project Emissions[2] (Table 4):				
Storage tanks GNR-0018339	0.11	0.11	0.11	0.11
$PTE_{post\text{-}project} - PTE_{pre\text{-}project}$:	0.02	0.02	0.03	0.03

[1] The post-project PTE emissions are shown in Table 9 in tons per quarter.
[2] The pre-project PTE emissions are shown in Table 4 in tons per quarter.

As shown in Table 24, the VOC emission increases from the proposed modification results in an increase of 0.02 tons for quarter 1, 0.02 tons for quarter 2, 0.03 for quarter 3 and 0.03 for quarter 4. The quarterly VOC emission increases must be offset by emission reductions. MBARD's Policy for Rounding, dated April 18, 2017, for determining the amount of offsets required in accordance with MBARD Rule 207 is to round up to the tenths place and to the nearest whole number. For example, the given number of decimal places is 0 so a quarterly offset amount of 0.03 tons rounds to 0. Thus, for this project, no offsets are required.

Visibility, soils, and vegetation analysis:
Section 3.2 requires the applicant to provide MBARD with an analysis of impairment to visibility, soils and vegetation. MBARD does not find it necessary to determine the negligible effect emissions from this modification will have on visibility, soils and vegetation.

Ambient air quality standards (AAQS) and emission increments:
Section 3.3, Ambient Air Quality Standards and Emission Increments, prohibits emissions from causing or contributing to a violation of an ambient air quality standard or exceeding any air quality increment. Moreover, Section 6.6, Air Quality Increment Analysis, prohibits a source which is subject to Section 4.2, Offset Requirements, from exceeding 50% of the remaining emissions increment.

The operation has the potential to emit ethanol emissions. Ozone (O_3), a component of smog, is formed in the atmosphere rather than being directly emitted from pollutant sources. O_3 forms as a result of VOCs and NO_x reacting in the presence of sunlight in the atmosphere. VOCs and NO_x are termed "O_3 precursors" and their emissions are regulated in order to control the creation of O_3. O_3 is a regional pollutant and ambient concentration can only be predicted using regional photochemical models that account for all sources of precursors, which is beyond the scope of this analysis. Therefore, no photochemical O_3 modeling was conducted. Furthermore, on February 25, 2021, the California Air Resources Board (CARB) approved the proposed updates to the State Area Designation based on 2017 to 2019 air quality data which designates MBARD as attainment for O_3.

<u>Rule 207 – Review of New of Modified Sources (as adopted on 2/15/2017)</u>
Note that MBARD has not received approval for the 2/15/2017 version of Rule 207 and MBARD is implementing Rule 207 as adopted on 4/20/2011. For informational purposes only, the Rule applicability of Rule 207 as adopted on 2/15/2017 is as follows:

The purpose of this Rule is to provide for the review of new and modified stationary air pollution sources to meet the New Source Review requirements under the provisions of the California Clean Air Act. This Rule provides mechanisms by which Authorities to Construct may be granted to such sources without interfering with the attainment or maintenance of California ambient air quality standards. Each project subject to New Source Review shall undergo a review under the federal requirements contained within Rule 220 and Rule 221, and a parallel review under the requirements of this Rule and the most stringent applicable provisions shall apply.

Rule 207 applies to all new stationary sources and all modifications to existing stationary sources, which after construction or modification, emit or have the potential to emit any affected pollutants. This project is subject to the requirements of this Rule.

BACT requirements

Pursuant to Section 4.1.1, BACT shall be required for any new or modified permit unit with a potential to emit 25 pounds per day or more of VOCs or NO_x. As shown in Table 20, California CACT determination, the proposed project does not have the potential to exceed 25 pounds per day of VOCs and is not a source of NO_x.

Pursuant to Section 4.1.2, BACT shall be required for a new or modified stationary source which has the potential to emit greater than or equal to any one of the affected pollutant levels listed in Table 4.1.1.

Table 25 shows the emissions from the new project, the facility-wide emissions and the BACT thresholds of Section 4.1.2, Table 4.1.1.

Table 25. Facility-wide Potential to Emit Emissions.

Application no./Equipment Description/Installation Date:	NO_x (lb/day)	VOC (lb/day)	CO (lb/day)	SO_x (lb/day)	PM^1 (lb/day)	PM_{10}^1 (lb/day)	$PM_{2.5}^1$ (lb/day)
MOD-23-00104/PTO GNR-0018339 Distillation equipment with storage tanks		2.95					
15666 Boiler #1 (6.277 MMBtu/hr) Installed 1981	14.35	0.79	12.05	0.09	1.09	1.08	1.08
15667 Boiler #2 (6.277 MMBtu/hr) Installed 1981	14.35	0.79	12.05	0.09	1.09	1.08	1.08
15668 Boiler #3 (12.554 MMBtu/hr) Installed 1985	28.69	1.58	24.10	0.17	2.18	2.17	2.16
15669 Boiler #4 (2.65 MMBtu/hr) Installed 1994	6.06	0.33	5.09	0.04	0.46	0.46	0.46
15671 Lab equipment with ventilation system Installed 2000		0.38					
15824 Emergency IC eng. fire pump (196 hp) Installed 1975	145.06	13.68	45.59	9.64	7.98	7.66	7.48
15825 Emergency IC eng. fire pump (134 hp) Installed 1975	99.17	9.35	31.17	6.59	5.45	5.23	5.11
GNR-0017748 Fermentation & Storage Initial Permit 1996		1,808.70					

Application no./Equipment Description/Installation Date:	NO_x (lb/day)	VOC (lb/day)	CO (lb/day)	SO_x (lb/day)	PM[1] (lb/day)	PM_{10}[1] (lb/day)	$PM_{2.5}$[1] (lb/day)
GNR-0017749 Barrel storage/aging Initial permit 2016		326.20					
GNR-0018338 Two-stage boiler (3.3584 MMBtu/hr total) Installed 2009	3.50	0.52	7.91	0.06	0.72	0.71	0.71
PTO-22-00043 Emergency engine-gen set (103 HP) Installed 2022	0.54	0.87	4.85	0.02	0.26	0.26	0.26
Total:	311.72	2,166.14	142.81	16.70	19.23	18.65	18.34
Table 4.1.1 Federal BACT Threshold:	150	150	550	150	150	82	54.79

[1] PM_{10} and $PM_{2.5}$ fractions estimated using CARB's CEIDARS particulate matter size profile database (updated 6/9/23). For gas-fired boilers (profile #1101): PM = PM_{10} = $PM_{2.5}$.

Table 25 shows that the new emissions, as defined in Section 2.37, exceed the BACT thresholds of Section 4.1.1 for NO_x and VOCs. As stated above in the Federal BACT analysis, the proposed project will need to meet the achieved in practice requirements of BACT guidelines 5.4.15. The proposed insulated storage tank with PVRV valve meets the BACT requirements.

Offset requirements

Pursuant Section 4.2, Offsets are required for any new or modified source, which has the potential to emit equal to or greater than the thresholds specified in Rule 207, Table 4.2.1. Table 26 shows the facility wide PTE emissions and the offset thresholds specified in Section 4.2, Table 4.2.1.

Table 26. Facility-wide potential to emit and offset determination.

Application no.:	NO_x (lb/day)	VOC (lb/day)	CO (lb/day)	SO_x (lb/day)	PM (lb/day)	PM_{10} (lb/day)
MOD-23-00104/PTO GNR-0018339 Distillation equipment with storage tanks		2.95				
15666 Boiler #1 (6.277 MMBtu/hr) Installed 1981	14.35	0.79	12.05	0.09	1.09	1.08
15667 Boiler #2 (6.277 MMBtu/hr) Installed 1981	14.35	0.79	12.05	0.09	1.09	1.08
15668 Boiler #3 (12.554 MMBtu/hr) Installed 1985	28.69	1.58	24.10	0.17	2.18	2.17
15669 Boiler #4 (2.65 MMBtu/hr) Installed 1994	6.06	0.33	5.09	0.04	0.46	0.46
15671 Lab equipment with ventilation system Installed 2000		0.38				
15824 Emergency IC eng. fire pump (196 hp) Installed 1975[2]						
15825 Emergency IC eng. fire pump (134 hp) Installed 1975[2]						
GNR-0017748 Fermentation & Storage Initial Permit 1996		1,808.70				

Application no.:	NO_x (lb/day)	VOC (lb/day)	CO (lb/day)	SO_x (lb/day)	PM (lb/day)	PM_{10} (lb/day)
GNR-0017749 Barrel storage/aging Initial permit 2016		326.20				
GNR-0018338 Two-stage boiler (3.3584 MMBtu/hr total) Installed 2009	3.50	0.52	7.91	0.06	0.72	0.71
PTO-22-00043 Emergency engine-gen set (103 HP) Installed 2022[2]						
Total:	66.95	2,142.24	61.20	0.45	5.54	5.50
Table 4.2.2 Offset Threshold:	150	150	550	150	150	82

[1] PM_{10} and $PM_{2.5}$ fractions estimated using CARB's CEIDARS particulate matter size profile database (updated 6/9/23). For gas-fired boilers (profile #1101): PM = PM_{10} = $PM_{2.5}$.
[2] Pursuant to Rule 207, Section 1.3.3, the offset requirements of Sections 4.2 and 5.3 shall not apply to any emergency internal combustion engine that is either only used for emergency power when normal power line service fails, or are used only for the emergency pumping of water, and are operated less than 60 hours per year of testing exercise.

Table 26 shows the facility exceeds the VOC offset threshold of Section 4.2, Table 4.2.1.

Pursuant to Section 4.2.3, offsets obtained shall be equal to the potential to emit increase from the proposed new source or modification. Table 27 shows the comparison of the VOC emissions profile for the proposed project, $PTE_{post\text{-}project}$, and the PTE emissions of the existing source, $PTE_{pre\text{-}project}$.

Table 27. Offset determination PTE.

Quarterly Profiles	Quarter 1 (tons/qtr)	Quarter 2 (tons/qtr)	Quarter 3 (tons/qtr)	Quarter 4 (tons/qtr)
PTE Post-Project Emissions[1] (Table 9):				
Storage tanks MOD-23-00104	0.13	0.13	0.14	0.14
PTE Pre-Project Emissions[2] (Table 4):				
Storage tanks GNR-0018339	0.11	0.11	0.11	0.11
$PTE_{post\text{-}project} - PTE_{pre\text{-}project}$:	0.02	0.02	0.03	0.03

[1] The post-project PTE emissions are shown in Table 9 in tons per quarter.
[2] The pre-project PTE emissions are shown in Table 4 in tons per quarter.

As shown in Table 27, the VOC emission increases from the proposed modification results in an increase of 0.02 tons for quarter 1, 0.02 tons for quarter 2, 0.03 for quarter 3 and 0.03 for quarter 4. The quarterly VOC emission increases must be offset by emission reductions. MBARD's Policy for Rounding, dated April 18, 2017, for determining the amount of offsets required in accordance with MBARD Rule 207 is to round up to the tenths place and to the nearest whole number. For example, the given number of decimal places is 0 so a quarterly offset amount of 0.05 tons rounds to 0. Thus, for this project, no offsets are required.

As pointed out, the Rule as amended on 2/15/2017 has not been approved and the version as adopted on 4/20/2011 will be implemented.

Rule 218 – Title V: Federal Operating Permits
This is the implementing regulation by which MBARD issues the federal Operating Permits. The facility

is subject to the requirements of this rule. The facility PTE VOC emissions exceed 100 tons per year. The facility currently operates under Title V permit TV-124.

Pursuant to Section 2.27.4, a modification that involves a case-by-case determination of any emission standard or other requirement is considered a significant permit modification. The proposed project was subject to a BACT and offset determination and is considered a significant modification. The facility will be required to submit a Title V permit modification and will be subject to the procedural requirements of Section 3.8.3. However, Section 2.17 defines an insignificant activity as an emissions unit with actual emissions less than 2 tons per year of any criteria pollutant. The proposed project has a PTE emission of 0.64 tons per year and is considered an insignificant activity.

Rule 221 – Federal Prevention of Significant Deterioration

The federal Prevention of Significant Deterioration (PSD) program is a construction permitting program for new major stationary sources and major modifications to existing major stationary sources located in areas classified as attainment or in areas that are unclassifiable for any criteria air pollutant. This Rule provides for the review of new and modified major stationary sources to meet requirements for PSD, under the provisions of the federal Clean Air Act. The purpose of this Rule is to incorporate the federal PSD rule requirements into MBARD's Rules and Regulations through incorporating the federal requirements by reference.

This Rule shall apply to any source and owner or operator of any source subject to any requirements under Title 40 Code of Federal Regulations, Part 52, Section 21 (40 CFR 52.21), as incorporated into this Rule. The proposed project does not meet the definition of a new major stationary source, or a major modification to an existing stationary source. Since the Prevention of Significant Deterioration (PSD) program only applies to new major stationary sources, or major modifications to stationary sources, this project is not subject to MBARD Rule 221.

Rule 222 – Minor New Source Review

This Rule provides for the review of new and modified stationary air pollution sources to meet the requirements for the review of such sources, under the new source review (NSR) provisions of the federal Clean Air Act. This Rule provides mechanisms by which Authorities to Construct may be granted to such sources without interfering with the attainment or maintenance of ambient air quality standards.

This Rule shall apply to any new or modified stationary source that emits an air pollutant (or its precursors) subject to any National Ambient Air Quality Standard (NAAQS).

Compliance with the New Source Review (NSR) provisions of the California Clean Air Act, as defined in MBARD Rule 207, ensures compliance with MBARD Rule 222, Federal Minor NSR.

Rule 300 – District Fees

This Rule provides the mechanisms for assessing fees for the issuance and renewal of Permits to Operate, Authorities to Construct, and other actions in MBARD's permit system; and to recover MBARD costs for requested services, materials, or equipment. The fees prescribed within this Rule do not exceed the cost of issuing, maintaining, and performing inspection activities pertaining to all permits.

This Rule shall apply to all owners and operators of stationary sources which are required by MBARD Rule 200 *Permits Required* to obtain an Authority to Construct or Permit to Operate; and to requesters of MBARD services, materials, or equipment.

According to MBARD Fee Determination Protocol, affirmed by the Board on 6/16/04, and revised on 8/26/19, the billable emissions shall be based on the 75% of the potential to emit for equipment listed on the permit unless operation is restricted by permit conditions. The permit will include throughput limits, thus the billable emissions will be based on the PTE emissions of 0.54 tons per year with a corresponding fee code of 502.

Rule 400 – Visible Emissions:
The purpose of this Rule is to provide limits for the visible emissions from sources within MBARD. The provisions of this Rule shall apply to all sources of air pollutant emissions in MBARD.

According to MBARD Rule 400 Section 3.1, no air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark or darker than Ringelmann 1, or equivalent 20% opacity. This requirement will be included as a permit condition.

Rule 402 – Nuisance:
The purpose of this Rule is to provide an explicit prohibition against sources creating public nuisances while operating within MBARD. The provisions of this Rule shall apply to all sources of air pollutant emissions within the Air District.

According to MBARD Rule 402, Part 3, no person shall discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or which endanger the comfort, repose, health, or safety of any such persons or the public; or which cause, or have a natural tendency to cause, injury or damage to business or property. This requirement will be included as a permit condition.

Rule 417 – Storage of Organic Liquids
The purpose of this Rule is to limit the emissions of organic solvent vapors from the storage of organic liquids. The provisions of this Rule shall apply to any container used to store organic liquids unless specifically exempted by this Rule.

Section 2.5 defines organic liquids as "liquids which are primarily but not exclusively derived from petroleum." Since the storage tanks in the cone spinning distillation column equipment will store ethanol derived from fermentation process, the tanks are not subject to the requirements of this Rule. In addition, the tanks used in this permit all have a capacity of less than 39,630 gallons and are exempt per Section 1.3.1.2.

Rule 436 – Title V: General Prohibitory Rule
The purpose of this Rule is to provide federally enforceable potential to emit limitations limiting emissions below the thresholds requiring federal Title V operating permits under Rule 218.

Exemptions
Pursuant to Section 1.3.1.3, any stationary source with a valid federal operating permit is exempt from the requirements of this Rule. As noted above, the facility currently operates under Title V permit TV-124 and

is not subject to the requirements of this Rule.

Rule 1000 – Toxic Air Contaminants:
This Rule applies to any new or modified stationary sources for which an Authority to Construct or a Permit to Operate is required pursuant to MBARD Regulation II - Permits, and which has the potential to emit into the atmosphere any TAC. Whenever a potential TAC may be subject to more than one MBARD Rule, or to more than one requirement in this rule, the requirement resulting in the least hazard to the public, as determined by the Air Pollution Control Officer, shall apply.

Ethanol emissions are expected from this equipment. Ethanol is not listed in the California Air Resources Board list of TACs for the AB2588 program or EPA's list of hazardous air pollutants (HAPs).

Health & Safety Code (H&SC) Section 42301.6 – Public Notification Requirements:
Pursuant to Section §42301.6(a), prior to approving an application for a permit to construct or modify a source that emits hazardous air emissions, and that source is located within 1,000 feet from the outer boundary of a school site, the air pollution control officer shall prepare a public notice in which the proposed project or modification for which the application for a permit is made is fully described. The notice may be prepared whether or not the material is or would be subject to subdivision (a) of Section 25536, if the air pollution control officer determines and the administering agency concurs that hazardous air emissions of the material may result from an air release, as defined by Section 44303. The notice may be combined with any other notice on the project or permit that is required by law.

MBARD protocol adopted by the board on 11/14/01 specifies the risk thresholds for public notification. If the carcinogenic risk is in excess of 1 in a million or non-carcinogenic risk is at or above the applicable Reference Exposure Levels, MBARD will do the Public Notice.

The project is not located within 1,000 feet of a school as shown in Figure 1.

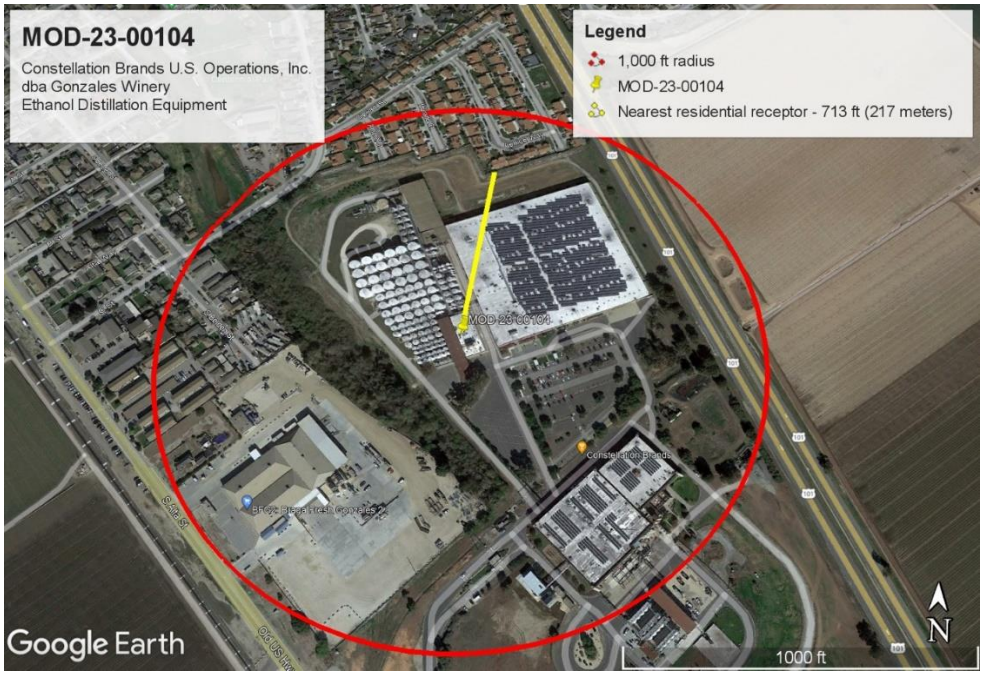

Figure 1. Google Earth Pro image.

CONCLUSIONS:

The equipment has the capability to comply with all applicable MBARD rules and regulations.

RECOMMENDATIONS:

Issue the Authority to Construct with the following additional conditions:

1. No later than twenty-four (24) hours prior to start-up of the equipment, the Constellation Brands U.S. Operations, Inc. dba Gonzales Winery must notify the Monterey Bay Air District (MBARD) and arrange for an inspection of the equipment during normal operation to verify compliance with MBARD Rules and Regulations. [Basis: MBARD Rule 207]

2. Annual process throughput shall be reported to MBARD, upon request. [Basis: MBARD Rule 207]

3. The throughput for the ethanol storage tanks and the aroma tanks shall be not exceed the following limits: [Basis: MBARD Rule 207]

Tank Id No.:	Tank Purpose	Annual Throughput (gal/yr)
Tk 1073	Ethanol Storage	101,299
Tk 1074	Ethanol Storage	101,299
Tk 1075	Ethanol Storage	101,299
Tk 2109	Ethanol Storage	500,229
Tk 2110	Ethanol Storage	379,873
Tk 9030	Aroma Storage	15,510

4. Tank 2110 shall be insulated, 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. [Basis: MBARD Rule 207, BACT]

5. Constellation Brands U.S., Inc. dba Gonzales Winery shall maintain on-site a daily log, summarized monthly, showing the volume of wine processed in the cone spinning distillation equipment, and the volume of ethanol sent to each ethanol storage tank. Records shall be retained for at least five years in a readily accessible location, and made available to MBARD staff upon request. [Basis: MBARD Rule 207]

6. The ethanol storage tanks and aroma 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. [Basis: MBARD Rule 207]

7. The ethanol storage tanks and the aroma tank shall remain in a gas-tight condition, except when ethanol is being added to the tank. [Basis: MBARD Rule 207]

8. No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as or darker than Ringelmann 1, or equivalent 20 percent opacity. [Basis: MBARD Rule 400]

9. No emissions shall constitute a public nuisance. [Basis: MBARD Rule 402]

Attachment 1:

Existing Pre-project EPA's TANKS 4.0.9.d Printouts

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GNR-018276
City:	Gonzales
State:	California
Company:	Constellation Brands U.S. Operations, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Tank Tk 1073

Tanks Tk 1074 & Tk 1075 are identical with same throughput and turn overs.

Tank Dimensions

Shell Height (ft):	12.50
Diameter (ft):	7.00
Liquid Height (ft) :	12.50
Avg. Liquid Height (ft):	6.25
Volume (gallons):	3,598.56
Turnovers:	82.26
Net Throughput(gal/yr):	296,000.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Santa Maria, California (Avg Atmospheric Pressure = 14.62 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

GNR-018276 - Vertical Fixed Roof Tank
Gonzales, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	All	63.04	54.35	71.73	58.58	0.7296	0.5406	0.9739	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GNR-018276 - Vertical Fixed Roof Tank
Gonzales, California

Annual Emission Calcaulations	
Standing Losses (lb):	42.1434
Vapor Space Volume (cu ft):	260.2940
Vapor Density (lb/cu ft):	0.0060
Vapor Space Expansion Factor:	0.0934
Vented Vapor Saturation Factor:	0.7927
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	260.2940
Tank Diameter (ft):	7.0000
Vapor Space Outage (ft):	6.7636
Tank Shell Height (ft):	12.5000
Average Liquid Height (ft):	6.2500
Roof Outage (ft):	0.5136
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5136
Dome Radius (ft):	0.0000
Shell Radius (ft):	3.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0060
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Daily Avg. Liquid Surface Temp. (deg. R):	522.7117
Daily Average Ambient Temp. (deg. F):	57.2417
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.2517
Tank Paint Solar Absorptance (Shell):	0.3900
Tank Paint Solar Absorptance (Roof):	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	1,638.9639
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0934
Daily Vapor Temperature Range (deg. R):	34.7575
Daily Vapor Pressure Range (psia):	0.4334
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.5406
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.9739
Daily Avg. Liquid Surface Temp. (deg R):	522.7117
Daily Min. Liquid Surface Temp. (deg R):	514.0223
Daily Max. Liquid Surface Temp. (deg R):	531.4011
Daily Ambient Temp. Range (deg. R):	23.4167
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.7927
Vapor Pressure at Daily Average Liquid:	
Surface Temperature (psia):	0.7296
Vapor Space Outage (ft):	6.7636
Working Losses (lb):	125.8847
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Annual Net Throughput (gal/yr.):	296,000.0000
Annual Turnovers:	82.2550
Turnover Factor:	0.5314
Maximum Liquid Volume (gal):	3,598.5635
Maximum Liquid Height (ft):	12.5000
Tank Diameter (ft):	7.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	168.0281

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

GNR-018276 - Vertical Fixed Roof Tank
Gonzales, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Ethyl alcohol	125.88	42.14	168.03

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GNR-018276 Tk2109
City:	Santa Maria
State:	California
Company:	Constellation Brands U.S. Operations, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Tank Tk2109

Tank Dimensions

Shell Height (ft):	16.50
Diameter (ft):	10.50
Liquid Height (ft) :	16.50
Avg. Liquid Height (ft):	8.25
Volume (gallons):	10,687.73
Turnovers:	27.70
Net Throughput(gal/yr):	296,000.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Santa Maria, California (Avg Atmospheric Pressure = 14.62 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

GNR-018276 Tk2109 - Vertical Fixed Roof Tank
Santa Maria, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	All	63.04	54.35	71.73	58.58	0.7296	0.5406	0.9739	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GNR-018276 Tk2109 - Vertical Fixed Roof Tank
Santa Maria, California

Annual Emission Calcaulations	
Standing Losses (lb):	115.6901
Vapor Space Volume (cu ft):	758.1874
Vapor Density (lb/cu ft):	0.0060
Vapor Space Expansion Factor:	0.0934
Vented Vapor Saturation Factor:	0.7470
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	758.1874
Tank Diameter (ft):	10.5000
Vapor Space Outage (ft):	8.7560
Tank Shell Height (ft):	16.5000
Average Liquid Height (ft):	8.2500
Roof Outage (ft):	0.5060
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5060
Dome Radius (ft):	0.0000
Shell Radius (ft):	5.2500
Vapor Density	
Vapor Density (lb/cu ft):	0.0060
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Daily Avg. Liquid Surface Temp. (deg. R):	522.7117
Daily Average Ambient Temp. (deg. F):	57.2417
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.2517
Tank Paint Solar Absorptance (Shell):	0.3900
Tank Paint Solar Absorptance (Roof):	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	1,638.9639
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0934
Daily Vapor Temperature Range (deg. R):	34.7575
Daily Vapor Pressure Range (psia):	0.4334
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.5406
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.9739
Daily Avg. Liquid Surface Temp. (deg R):	522.7117
Daily Min. Liquid Surface Temp. (deg R):	514.0223
Daily Max. Liquid Surface Temp. (deg R):	531.4011
Daily Ambient Temp. Range (deg. R):	23.4167
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.7470
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.7296
Vapor Space Outage (ft):	8.7560
Working Losses (lb):	236.8988
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Annual Net Throughput (gal/yr.):	296,000.0000
Annual Turnovers:	27.6953
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	10,687.7336
Maximum Liquid Height (ft):	16.5000
Tank Diameter (ft):	10.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	352.5890

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

GNR-018276 Tk2109 - Vertical Fixed Roof Tank
Santa Maria, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Ethyl alcohol	236.90	115.69	352.59

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GNR-018276 Tk9030
City:	Santa Maria
State:	California
Company:	Constellation Brands U.S. Operations, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Tk 9030

Tank Dimensions

Shell Height (ft):	5.33
Diameter (ft):	4.00
Liquid Height (ft) :	4.00
Avg. Liquid Height (ft):	2.67
Volume (gallons):	376.01
Turnovers:	41.25
Net Throughput(gal/yr):	15,510.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Santa Maria, California (Avg Atmospheric Pressure = 14.62 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

GNR-018276 Tk9030 - Vertical Fixed Roof Tank
Santa Maria, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	All	63.04	54.35	71.73	58.58	0.7296	0.5406	0.9739	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GNR-018276 Tk9030 - Vertical Fixed Roof Tank
Santa Maria, California

Annual Emission Calcaulations	
Standing Losses (lb):	7.3226
Vapor Space Volume (cu ft):	40.2962
Vapor Density (lb/cu ft):	0.0060
Vapor Space Expansion Factor:	0.0934
Vented Vapor Saturation Factor:	0.8897
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	40.2962
Tank Diameter (ft):	4.0000
Vapor Space Outage (ft):	3.2067
Tank Shell Height (ft):	5.3300
Average Liquid Height (ft):	2.6650
Roof Outage (ft):	0.5417
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5417
Dome Radius (ft):	0.0000
Shell Radius (ft):	2.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0060
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Daily Avg. Liquid Surface Temp. (deg. R):	522.7117
Daily Average Ambient Temp. (deg. F):	57.2417
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.2517
Tank Paint Solar Absorptance (Shell):	0.3900
Tank Paint Solar Absorptance (Roof):	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	1,638.9639
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0934
Daily Vapor Temperature Range (deg. R):	34.7575
Daily Vapor Pressure Range (psia):	0.4334
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.5406
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.9739
Daily Avg. Liquid Surface Temp. (deg R):	522.7117
Daily Min. Liquid Surface Temp. (deg R):	514.0223
Daily Max. Liquid Surface Temp. (deg R):	531.4011
Daily Ambient Temp. Range (deg. R):	23.4167
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.8897
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.7296
Vapor Space Outage (ft):	3.2067
Working Losses (lb):	11.0969
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Annual Net Throughput (gal/yr.):	15,510.0000
Annual Turnovers:	41.2486
Turnover Factor:	0.8940
Maximum Liquid Volume (gal):	376.0132
Maximum Liquid Height (ft):	4.0000
Tank Diameter (ft):	4.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	18.4196

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

GNR-018276 Tk9030 - Vertical Fixed Roof Tank
Santa Maria, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Ethyl alcohol	11.10	7.32	18.42

Attachment 2:

Proposed Post-project EPA's TANKS 4.0.9.d Printouts

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tanks TK 1073, TK 1074 & TK 1075
City:	Santa Maria
State:	California
Company:	Constellation Brands U.S. Operations, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Tanks have the same dimensions, storing ethanol with capacity of 3,200 gallons.

Tank Dimensions

Shell Height (ft):	12.50
Diameter (ft):	7.00
Liquid Height (ft) :	12.50
Avg. Liquid Height (ft):	6.25
Volume (gallons):	3,598.56
Turnovers:	28.15
Net Throughput(gal/yr):	101,299.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Santa Maria, California (Avg Atmospheric Pressure = 14.62 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tanks TK 1073, TK 1074 & TK 1075 - Vertical Fixed Roof Tank
Santa Maria, California

		Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp	Vapor Pressure (psia)			Vapor Mol.	Liquid Mass	Vapor Mass	Mol.	Basis for Vapor Pressure
Mixture/Component	Month	Avg.	Min.	Max.	(deg F)	Avg.	Min.	Max.	Weight.	Fract.	Fract.	Weight	Calculations
Ethyl alcohol	All	63.04	54.35	71.73	58.58	0.7296	0.5406	0.9739	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tanks TK 1073, TK 1074 & TK 1075 - Vertical Fixed Roof Tank
Santa Maria, California

Annual Emission Calcaulations	
Standing Losses (lb):	42.1434
Vapor Space Volume (cu ft):	260.2940
Vapor Density (lb/cu ft):	0.0060
Vapor Space Expansion Factor:	0.0934
Vented Vapor Saturation Factor:	0.7927
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	260.2940
Tank Diameter (ft):	7.0000
Vapor Space Outage (ft):	6.7636
Tank Shell Height (ft):	12.5000
Average Liquid Height (ft):	6.2500
Roof Outage (ft):	0.5136
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5136
Dome Radius (ft):	0.0000
Shell Radius (ft):	3.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0060
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Daily Avg. Liquid Surface Temp. (deg. R):	522.7117
Daily Average Ambient Temp. (deg. F):	57.2417
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.2517
Tank Paint Solar Absorptance (Shell):	0.3900
Tank Paint Solar Absorptance (Roof):	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	1,638.9639
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0934
Daily Vapor Temperature Range (deg. R):	34.7575
Daily Vapor Pressure Range (psia):	0.4334
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.5406
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.9739
Daily Avg. Liquid Surface Temp. (deg R):	522.7117
Daily Min. Liquid Surface Temp. (deg R):	514.0223
Daily Max. Liquid Surface Temp. (deg R):	531.4011
Daily Ambient Temp. Range (deg. R):	23.4167
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.7927
Vapor Pressure at Daily Average Liquid:	
Surface Temperature (psia):	0.7296
Vapor Space Outage (ft):	6.7636
Working Losses (lb):	81.0730
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Annual Net Throughput (gal/yr.):	101,299.0000
Annual Turnovers:	28.1498
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	3,598.5635
Maximum Liquid Height (ft):	12.5000
Tank Diameter (ft):	7.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	123.2164

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tanks TK 1073, TK 1074 & TK 1075 - Vertical Fixed Roof Tank
Santa Maria, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Ethyl alcohol	81.07	42.14	123.22

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tank TK2109
City:	Santa Maria
State:	California
Company:	Constellation Brands U.S. Operations, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Ethanol storage tank with 15,802 gal capacity

Tank Dimensions

Shell Height (ft):	16.50
Diameter (ft):	10.50
Liquid Height (ft) :	16.50
Avg. Liquid Height (ft):	8.25
Volume (gallons):	10,687.73
Turnovers:	46.80
Net Throughput(gal/yr):	500,229.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Santa Maria, California (Avg Atmospheric Pressure = 14.62 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tank TK2109 - Vertical Fixed Roof Tank
Santa Maria, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	All	63.04	54.35	71.73	58.58	0.7296	0.5406	0.9739	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank TK2109 - Vertical Fixed Roof Tank
Santa Maria, California

Annual Emission Calcaulations	
Standing Losses (lb):	115.6901
Vapor Space Volume (cu ft):	758.1874
Vapor Density (lb/cu ft):	0.0060
Vapor Space Expansion Factor:	0.0934
Vented Vapor Saturation Factor:	0.7470
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	758.1874
Tank Diameter (ft):	10.5000
Vapor Space Outage (ft):	8.7560
Tank Shell Height (ft):	16.5000
Average Liquid Height (ft):	8.2500
Roof Outage (ft):	0.5060
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5060
Dome Radius (ft):	0.0000
Shell Radius (ft):	5.2500
Vapor Density	
Vapor Density (lb/cu ft):	0.0060
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Daily Avg. Liquid Surface Temp. (deg. R):	522.7117
Daily Average Ambient Temp. (deg. F):	57.2417
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.2517
Tank Paint Solar Absorptance (Shell):	0.3900
Tank Paint Solar Absorptance (Roof):	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	1,638.9639
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0934
Daily Vapor Temperature Range (deg. R):	34.7575
Daily Vapor Pressure Range (psia):	0.4334
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.5406
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.9739
Daily Avg. Liquid Surface Temp. (deg R):	522.7117
Daily Min. Liquid Surface Temp. (deg R):	514.0223
Daily Max. Liquid Surface Temp. (deg R):	531.4011
Daily Ambient Temp. Range (deg. R):	23.4167
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.7470
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.7296
Vapor Space Outage (ft):	8.7560
Working Losses (lb):	323.3377
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Annual Net Throughput (gal/yr.):	500,229.0000
Annual Turnovers:	46.8040
Turnover Factor:	0.8076
Maximum Liquid Volume (gal):	10,687.7336
Maximum Liquid Height (ft):	16.5000
Tank Diameter (ft):	10.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	439.0278

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank TK2109 - Vertical Fixed Roof Tank
Santa Maria, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Ethyl alcohol	323.34	115.69	439.03

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	TK 2110
City:	Santa Maria
State:	California
Company:	Constellation Brands U.S. Operations, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Ethanol storage tank with 12,000 gal capacity

Tank Dimensions

Shell Height (ft):	16.67
Diameter (ft):	11.75
Liquid Height (ft) :	16.67
Avg. Liquid Height (ft):	8.34
Volume (gallons):	13,521.80
Turnovers:	28.09
Net Throughput(gal/yr):	379,873.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Santa Maria, California (Avg Atmospheric Pressure = 14.62 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TK 2110 - Vertical Fixed Roof Tank
Santa Maria, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	All	63.04	54.35	71.73	58.58	0.7296	0.5406	0.9739	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

TK 2110 - Vertical Fixed Roof Tank
Santa Maria, California

Annual Emission Calcaulations	
Standing Losses (lb):	145.9081
Vapor Space Volume (cu ft):	958.5383
Vapor Density (lb/cu ft):	0.0060
Vapor Space Expansion Factor:	0.0934
Vented Vapor Saturation Factor:	0.7452
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	958.5383
Tank Diameter (ft):	11.7500
Vapor Space Outage (ft):	8.8398
Tank Shell Height (ft):	16.6700
Average Liquid Height (ft):	8.3350
Roof Outage (ft):	0.5048
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5048
Dome Radius (ft):	0.0000
Shell Radius (ft):	5.8750
Vapor Density	
Vapor Density (lb/cu ft):	0.0060
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Daily Avg. Liquid Surface Temp. (deg. R):	522.7117
Daily Average Ambient Temp. (deg. F):	57.2417
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.2517
Tank Paint Solar Absorptance (Shell):	0.3900
Tank Paint Solar Absorptance (Roof):	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	1,638.9639
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0934
Daily Vapor Temperature Range (deg. R):	34.7575
Daily Vapor Pressure Range (psia):	0.4334
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.5406
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.9739
Daily Avg. Liquid Surface Temp. (deg R):	522.7117
Daily Min. Liquid Surface Temp. (deg R):	514.0223
Daily Max. Liquid Surface Temp. (deg R):	531.4011
Daily Ambient Temp. Range (deg. R):	23.4167
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.7452
Vapor Pressure at Daily Average Liquid:	
Surface Temperature (psia):	0.7296
Vapor Space Outage (ft):	8.8398
Working Losses (lb):	304.0252
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Annual Net Throughput (gal/yr.):	379,873.0000
Annual Turnovers:	28.0934
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	13,521.7970
Maximum Liquid Height (ft):	16.6700
Tank Diameter (ft):	11.7500
Working Loss Product Factor:	1.0000
Total Losses (lb):	449.9333

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK 2110 - Vertical Fixed Roof Tank
Santa Maria, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Ethyl alcohol	304.03	145.91	449.93

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tk 2110_Insulated
City:	Santa Maria
State:	California
Company:	Constellation Brands U.S. Operations, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Insulated ethanol storage tank with 12,000 gal capacity

Tank Dimensions

Shell Height (ft):	16.67
Diameter (ft):	11.75
Liquid Height (ft) :	16.67
Avg. Liquid Height (ft):	8.34
Volume (gallons):	13,521.80
Turnovers:	28.09
Net Throughput(gal/yr):	379,873.00
Is Tank Heated (y/n):	Y

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Santa Maria, California (Avg Atmospheric Pressure = 14.62 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tk 2110_Insulated - Vertical Fixed Roof Tank
Santa Maria, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	All	57.24	57.24	57.24	57.24	0.5980	0.5980	0.5980	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tk 2110_Insulated - Vertical Fixed Roof Tank
Santa Maria, California

Annual Emission Calcaulations	
Standing Losses (lb):	0.0000
Vapor Space Volume (cu ft):	958.5383
Vapor Density (lb/cu ft):	0.0050
Vapor Space Expansion Factor:	0.0000
Vented Vapor Saturation Factor:	0.7812
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	958.5383
Tank Diameter (ft):	11.7500
Vapor Space Outage (ft):	8.8398
Tank Shell Height (ft):	16.6700
Average Liquid Height (ft):	8.3350
Roof Outage (ft):	0.5048
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5048
Dome Radius (ft):	0.0000
Shell Radius (ft):	5.8750
Vapor Density	
Vapor Density (lb/cu ft):	0.0050
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5980
Daily Avg. Liquid Surface Temp. (deg. R):	516.9100
Daily Average Ambient Temp. (deg. F):	57.2417
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	516.9100
Tank Paint Solar Absorptance (Shell):	0.3900
Tank Paint Solar Absorptance (Roof):	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	1,638.9639
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0000
Daily Vapor Temperature Range (deg. R):	0.0000
Daily Vapor Pressure Range (psia):	0.0000
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5980
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.5980
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.5980
Daily Avg. Liquid Surface Temp. (deg R):	516.9100
Daily Min. Liquid Surface Temp. (deg R):	516.9100
Daily Max. Liquid Surface Temp. (deg R):	516.9100
Daily Ambient Temp. Range (deg. R):	23.4167
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.7812
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.5980
Vapor Space Outage (ft):	8.8398
Working Losses (lb):	249.1671
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5980
Annual Net Throughput (gal/yr.):	379,873.0000
Annual Turnovers:	28.0934
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	13,521.7970
Maximum Liquid Height (ft):	16.6700
Tank Diameter (ft):	11.7500
Working Loss Product Factor:	1.0000
Total Losses (lb):	249.1671

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tk 2110_Insulated - Vertical Fixed Roof Tank
Santa Maria, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Ethyl alcohol	249.17	0.00	249.17

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GNR-018276 Tk9030
City:	Santa Maria
State:	California
Company:	Constellation Brands U.S. Operations, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Tk 9030

Tank Dimensions

Shell Height (ft):	5.33
Diameter (ft):	4.00
Liquid Height (ft) :	4.00
Avg. Liquid Height (ft):	2.67
Volume (gallons):	376.01
Turnovers:	41.25
Net Throughput(gal/yr):	15,510.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Santa Maria, California (Avg Atmospheric Pressure = 14.62 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

GNR-018276 Tk9030 - Vertical Fixed Roof Tank
Santa Maria, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	All	63.04	54.35	71.73	58.58	0.7296	0.5406	0.9739	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GNR-018276 Tk9030 - Vertical Fixed Roof Tank
Santa Maria, California

Annual Emission Calcaulations	
Standing Losses (lb):	7.3226
Vapor Space Volume (cu ft):	40.2962
Vapor Density (lb/cu ft):	0.0060
Vapor Space Expansion Factor:	0.0934
Vented Vapor Saturation Factor:	0.8897
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	40.2962
Tank Diameter (ft):	4.0000
Vapor Space Outage (ft):	3.2067
Tank Shell Height (ft):	5.3300
Average Liquid Height (ft):	2.6650
Roof Outage (ft):	0.5417
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5417
Dome Radius (ft):	0.0000
Shell Radius (ft):	2.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0060
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Daily Avg. Liquid Surface Temp. (deg. R):	522.7117
Daily Average Ambient Temp. (deg. F):	57.2417
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.2517
Tank Paint Solar Absorptance (Shell):	0.3900
Tank Paint Solar Absorptance (Roof):	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	1,638.9639
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0934
Daily Vapor Temperature Range (deg. R):	34.7575
Daily Vapor Pressure Range (psia):	0.4334
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.5406
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.9739
Daily Avg. Liquid Surface Temp. (deg R):	522.7117
Daily Min. Liquid Surface Temp. (deg R):	514.0223
Daily Max. Liquid Surface Temp. (deg R):	531.4011
Daily Ambient Temp. Range (deg. R):	23.4167
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.8897
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.7296
Vapor Space Outage (ft):	3.2067
Working Losses (lb):	11.0969
Vapor Molecular Weight (lb/lb-mole):	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.7296
Annual Net Throughput (gal/yr.):	15,510.0000
Annual Turnovers:	41.2486
Turnover Factor:	0.8940
Maximum Liquid Volume (gal):	376.0132
Maximum Liquid Height (ft):	4.0000
Tank Diameter (ft):	4.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	18.4196

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

GNR-018276 Tk9030 - Vertical Fixed Roof Tank
Santa Maria, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Ethyl alcohol	11.10	7.32	18.42

Attachment 3:

Actual Historic Pre-project EPA's TANKS 4.0.9.d Printouts

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	T1073_ahe_monthly
City:	Santa Maria
State:	California
Company:	Constellation Brands U.S. Operations, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Tanks have the same dimensions, storing ethanol with capacity of 3,200 gallons.

Tank Dimensions

Shell Height (ft):	12.50
Diameter (ft):	7.00
Liquid Height (ft) :	12.50
Avg. Liquid Height (ft):	6.25
Volume (gallons):	3,598.56
Turnovers:	4.52
Net Throughput(gal/yr):	16,268.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Santa Maria, California (Avg Atmospheric Pressure = 14.62 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T1073_ahe_monthly - Vertical Fixed Roof Tank
Santa Maria, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	Jan	58.04	50.99	65.09	58.58	0.6148	0.4799	0.7817	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Feb	59.54	51.96	67.11	58.58	0.6474	0.4968	0.8363	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Mar	60.79	52.44	69.15	58.58	0.6759	0.5052	0.8948	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Apr	62.93	53.17	72.68	58.58	0.7268	0.5185	1.0045	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	May	64.74	54.85	74.63	58.58	0.7727	0.5502	1.0698	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Jun	66.70	56.59	76.81	58.58	0.8250	0.5845	1.1473	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Jul	67.88	57.73	78.02	58.58	0.8580	0.6082	1.1925	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Aug	67.60	58.09	77.11	58.58	0.8500	0.6158	1.1583	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Sep	66.23	57.34	75.13	58.58	0.8123	0.6001	1.0871	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Oct	63.88	55.45	72.31	58.58	0.7506	0.5617	0.9925	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Nov	60.34	52.83	67.86	58.58	0.6655	0.5122	0.8574	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Dec	57.84	50.79	64.89	58.58	0.6105	0.4764	0.7765	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T1073_ahe_monthly - Vertical Fixed Roof Tank
Santa Maria, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	2.4174	2.4809	3.1814	3.8957	4.3417	4.5942	4.9568	4.5894	3.9536	3.5677	2.7100	2.4017
Vapor Space Volume (cu ft):	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940
Vapor Density (lb/cu ft):	0.0051	0.0054	0.0056	0.0060	0.0063	0.0067	0.0070	0.0069	0.0066	0.0062	0.0055	0.0051
Vapor Space Expansion Factor:	0.0717	0.0783	0.0879	0.1053	0.1086	0.1133	0.1150	0.1072	0.0986	0.0912	0.0782	0.0716
Vented Vapor Saturation Factor:	0.8194	0.8116	0.8050	0.7933	0.7831	0.7718	0.7648	0.7665	0.7745	0.7880	0.8074	0.8204
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940
Tank Diameter (ft):	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000
Vapor Space Outage (ft):	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636
Tank Shell Height (ft):	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000
Average Liquid Height (ft):	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500
Roof Outage (ft):	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136
Roof Outage (Dome Roof)												
Roof Outage (ft):	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136
Dome Radius (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Shell Radius (ft):	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000
Vapor Density												
Vapor Density (lb/cu ft):	0.0051	0.0054	0.0056	0.0060	0.0063	0.0067	0.0070	0.0069	0.0066	0.0062	0.0055	0.0051
Vapor Molecular Weight (lb/lb-mole):	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Daily Avg. Liquid Surface Temp. (deg. R):	517.7099	519.2067	520.4628	522.5955	524.4110	526.3679	527.5466	527.2672	525.9040	523.5488	520.0120	517.5081
Daily Average Ambient Temp. (deg. F):	51.0500	52.5500	52.7500	54.7000	57.1000	60.6500	63.1000	64.0000	63.5500	60.9500	55.5000	51.0000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517
Tank Paint Solar Absorptance (Shell):	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900
Tank Paint Solar Absorptance (Roof):	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	899.7777	1,171.3608	1,550.4985	1,964.2186	2,210.7374	2,338.9144	2,371.5933	2,152.3597	1,774.1738	1,381.0763	1,011.4568	841.4000
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0717	0.0783	0.0879	0.1053	0.1086	0.1133	0.1150	0.1072	0.0986	0.0912	0.0782	0.0716
Daily Vapor Temperature Range (deg. R):	28.1856	30.2873	33.4194	39.0173	39.5493	40.4449	40.5858	38.0478	35.5740	33.7294	30.0531	28.1961
Daily Vapor Pressure Range (psia):	0.3018	0.3396	0.3896	0.4860	0.5196	0.5628	0.5843	0.5426	0.4871	0.4308	0.3451	0.3001
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.4799	0.4968	0.5052	0.5185	0.5502	0.5845	0.6082	0.6158	0.6001	0.5617	0.5122	0.4764
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.7817	0.8363	0.8948	1.0045	1.0698	1.1473	1.1925	1.1583	1.0871	0.9925	0.8574	0.7765
Daily Avg. Liquid Surface Temp. (deg R):	517.7099	519.2067	520.4628	522.5955	524.4110	526.3679	527.5466	527.2672	525.9040	523.5488	520.0120	517.5081
Daily Min. Liquid Surface Temp. (deg R):	510.6636	511.6349	512.1080	512.8412	514.5237	516.2567	517.4002	517.7552	517.0105	515.1165	512.4988	510.4591
Daily Max. Liquid Surface Temp. (deg R):	524.7563	526.7785	528.8177	532.3498	534.2983	536.4792	537.6931	536.7791	534.7975	531.9812	527.5253	524.5571
Daily Ambient Temp. Range (deg. R):	25.5000	24.3000	22.9000	24.4000	21.4000	20.7000	20.4000	20.2000	22.5000	25.9000	26.4000	26.4000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.8194	0.8116	0.8050	0.7933	0.7831	0.7718	0.7648	0.7665	0.7745	0.7880	0.8074	0.8204
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Vapor Space Outage (ft):	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636
Working Losses (lb):	1.8388	0.0002	2.0677	1.7886	0.3873	0.1578	1.1259	3.1239	0.0000	1.3733	0.7519	0.4235
Vapor Molecular Weight (lb/lb-mole):	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Net Throughput (gal/mo.):	2,726.6700	0.3300	2,789.0000	2,243.6700	457.0000	174.3300	1,196.3300	3,350.3300	0.0000	1,668.0000	1,030.0000	632.3300
Annual Turnovers:	4.5207	4.5207	4.5207	4.5207	4.5207	4.5207	4.5207	4.5207	4.5207	4.5207	4.5207	4.5207
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635
Maximum Liquid Height (ft):	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000
Tank Diameter (ft):	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	4.2562	2.4811	5.2491	5.6844	4.7290	4.7520	6.0826	7.7133	3.9536	4.9410	3.4619	2.8251

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T1073_ahe_monthly - Vertical Fixed Roof Tank
Santa Maria, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Ethyl alcohol	13.04	43.09	56.13

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	T1074_ahe_monthly
City:	Santa Maria
State:	California
Company:	Constellation Brands U.S. Operations, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Tanks have the same dimensions, storing ethanol with capacity of 3,200 gallons.

Tank Dimensions

Shell Height (ft):	12.50
Diameter (ft):	7.00
Liquid Height (ft) :	12.50
Avg. Liquid Height (ft):	6.25
Volume (gallons):	3,598.56
Turnovers:	3.54
Net Throughput(gal/yr):	12,730.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Santa Maria, California (Avg Atmospheric Pressure = 14.62 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T1074_ahe_monthly - Vertical Fixed Roof Tank
Santa Maria, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	Jan	58.04	50.99	65.09	58.58	0.6148	0.4799	0.7817	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Feb	59.54	51.96	67.11	58.58	0.6474	0.4968	0.8363	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Mar	60.79	52.44	69.15	58.58	0.6759	0.5052	0.8948	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Apr	62.93	53.17	72.68	58.58	0.7268	0.5185	1.0045	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	May	64.74	54.85	74.63	58.58	0.7727	0.5502	1.0698	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Jun	66.70	56.59	76.81	58.58	0.8250	0.5845	1.1473	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Jul	67.88	57.73	78.02	58.58	0.8580	0.6082	1.1925	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Aug	67.60	58.09	77.11	58.58	0.8500	0.6158	1.1583	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Sep	66.23	57.34	75.13	58.58	0.8123	0.6001	1.0871	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Oct	63.88	55.45	72.31	58.58	0.7506	0.5617	0.9925	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Nov	60.34	52.83	67.86	58.58	0.6655	0.5122	0.8574	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Dec	57.84	50.79	64.89	58.58	0.6105	0.4764	0.7765	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T1074_ahe_monthly - Vertical Fixed Roof Tank
Santa Maria, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	2.4174	2.4809	3.1814	3.8957	4.3417	4.5942	4.9568	4.5894	3.9536	3.5677	2.7100	2.4017
Vapor Space Volume (cu ft):	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940
Vapor Density (lb/cu ft):	0.0051	0.0054	0.0056	0.0060	0.0063	0.0067	0.0070	0.0069	0.0066	0.0062	0.0055	0.0051
Vapor Space Expansion Factor:	0.0717	0.0783	0.0879	0.1053	0.1086	0.1133	0.1150	0.1072	0.0986	0.0912	0.0782	0.0716
Vented Vapor Saturation Factor:	0.8194	0.8116	0.8050	0.7933	0.7831	0.7718	0.7648	0.7665	0.7745	0.7880	0.8074	0.8204
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940
Tank Diameter (ft):	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000
Vapor Space Outage (ft):	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636
Tank Shell Height (ft):	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000
Average Liquid Height (ft):	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500
Roof Outage (ft):	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136
Roof Outage (Dome Roof)												
Roof Outage (ft):	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136
Dome Radius (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Shell Radius (ft):	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000
Vapor Density												
Vapor Density (lb/cu ft):	0.0051	0.0054	0.0056	0.0060	0.0063	0.0067	0.0070	0.0069	0.0066	0.0062	0.0055	0.0051
Vapor Molecular Weight (lb/lb-mole):	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Daily Avg. Liquid Surface Temp. (deg. R):	517.7099	519.2067	520.4628	522.5955	524.4110	526.3679	527.5466	527.2672	525.9040	523.5488	520.0120	517.5081
Daily Average Ambient Temp. (deg. F):	51.0500	52.5500	52.7500	54.7000	57.1000	60.6500	63.1000	64.0000	63.5500	60.9500	55.5000	51.0000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517
Tank Paint Solar Absorptance (Shell):	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900
Tank Paint Solar Absorptance (Roof):	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	899.7777	1,171.3608	1,550.4985	1,964.2186	2,210.7374	2,338.9144	2,371.5933	2,152.3597	1,774.1738	1,381.0763	1,011.4568	841.4000
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0717	0.0783	0.0879	0.1053	0.1086	0.1133	0.1150	0.1072	0.0986	0.0912	0.0782	0.0716
Daily Vapor Temperature Range (deg. R):	28.1856	30.2873	33.4194	39.0173	39.5493	40.4449	40.5858	38.0478	35.5740	33.7294	30.0531	28.1961
Daily Vapor Pressure Range (psia):	0.3018	0.3396	0.3896	0.4860	0.5196	0.5628	0.5843	0.5426	0.4871	0.4308	0.3451	0.3001
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.4799	0.4968	0.5052	0.5185	0.5502	0.5845	0.6082	0.6158	0.6001	0.5617	0.5122	0.4764
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.7817	0.8363	0.8948	1.0045	1.0698	1.1473	1.1925	1.1583	1.0871	0.9925	0.8574	0.7765
Daily Avg. Liquid Surface Temp. (deg R):	517.7099	519.2067	520.4628	522.5955	524.4110	526.3679	527.5466	527.2672	525.9040	523.5488	520.0120	517.5081
Daily Min. Liquid Surface Temp. (deg R):	510.6636	511.6349	512.1080	512.8412	514.5237	516.2567	517.4002	517.7552	517.0105	515.1165	512.4988	510.4591
Daily Max. Liquid Surface Temp. (deg R):	524.7563	526.7785	528.8177	532.3498	534.2983	536.4792	537.6931	536.7791	534.7975	531.9812	527.5253	524.5571
Daily Ambient Temp. Range (deg. R):	25.5000	24.3000	22.9000	24.4000	21.4000	20.7000	20.4000	20.2000	22.5000	25.9000	26.4000	26.4000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.8194	0.8116	0.8050	0.7933	0.7831	0.7718	0.7648	0.7665	0.7745	0.7880	0.8074	0.8204
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Vapor Space Outage (ft):	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636
Working Losses (lb):	0.6701	0.8441	1.0928	0.8413	1.5361	0.6799	0.4618	1.4421	0.0000	1.1180	1.2710	0.2132
Vapor Molecular Weight (lb/lb-mole):	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Net Throughput (gal/mo.):	993.6700	1,188.6700	1,474.0000	1,055.3300	1,812.3300	751.3300	490.6700	1,546.6700	0.0000	1,358.0000	1,741.0000	318.3300
Annual Turnovers:	3.5375	3.5375	3.5375	3.5375	3.5375	3.5375	3.5375	3.5375	3.5375	3.5375	3.5375	3.5375
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635
Maximum Liquid Height (ft):	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000
Tank Diameter (ft):	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	3.0875	3.3250	4.2742	4.7370	5.8777	5.2741	5.4185	6.0315	3.9536	4.6857	3.9809	2.6148

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T1074_ahe_monthly - Vertical Fixed Roof Tank
Santa Maria, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Ethyl alcohol	10.17	43.09	53.26

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	T1075_ahe_monthly
City:	Santa Maria
State:	California
Company:	Constellation Brands U.S. Operations, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Tanks have the same dimensions, storing ethanol with capacity of 3,200 gallons.

Tank Dimensions

Shell Height (ft):	12.50
Diameter (ft):	7.00
Liquid Height (ft) :	12.50
Avg. Liquid Height (ft):	6.25
Volume (gallons):	3,598.56
Turnovers:	4.44
Net Throughput(gal/yr):	15,964.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Santa Maria, California (Avg Atmospheric Pressure = 14.62 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T1075_ahe_monthly - Vertical Fixed Roof Tank
Santa Maria, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	Jan	58.04	50.99	65.09	58.58	0.6148	0.4799	0.7817	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Feb	59.54	51.96	67.11	58.58	0.6474	0.4968	0.8363	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Mar	60.79	52.44	69.15	58.58	0.6759	0.5052	0.8948	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Apr	62.93	53.17	72.68	58.58	0.7268	0.5185	1.0045	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	May	64.74	54.85	74.63	58.58	0.7727	0.5502	1.0698	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Jun	66.70	56.59	76.81	58.58	0.8250	0.5845	1.1473	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Jul	67.88	57.73	78.02	58.58	0.8580	0.6082	1.1925	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Aug	67.60	58.09	77.11	58.58	0.8500	0.6158	1.1583	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Sep	66.23	57.34	75.13	58.58	0.8123	0.6001	1.0871	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Oct	63.88	55.45	72.31	58.58	0.7506	0.5617	0.9925	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Nov	60.34	52.83	67.86	58.58	0.6655	0.5122	0.8574	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Dec	57.84	50.79	64.89	58.58	0.6105	0.4764	0.7765	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T1075_ahe_monthly - Vertical Fixed Roof Tank
Santa Maria, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	2.4174	2.4809	3.1814	3.8957	4.3417	4.5942	4.9568	4.5894	3.9536	3.5677	2.7100	2.4017
Vapor Space Volume (cu ft):	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940
Vapor Density (lb/cu ft):	0.0051	0.0054	0.0056	0.0060	0.0063	0.0067	0.0070	0.0069	0.0066	0.0062	0.0055	0.0051
Vapor Space Expansion Factor:	0.0717	0.0783	0.0879	0.1053	0.1086	0.1133	0.1150	0.1072	0.0986	0.0912	0.0782	0.0716
Vented Vapor Saturation Factor:	0.8194	0.8116	0.8050	0.7933	0.7831	0.7718	0.7648	0.7665	0.7745	0.7880	0.8074	0.8204
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940	260.2940
Tank Diameter (ft):	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000
Vapor Space Outage (ft):	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636
Tank Shell Height (ft):	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000
Average Liquid Height (ft):	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500	6.2500
Roof Outage (ft):	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136
Roof Outage (Dome Roof)												
Roof Outage (ft):	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136	0.5136
Dome Radius (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Shell Radius (ft):	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000
Vapor Density												
Vapor Density (lb/cu ft):	0.0051	0.0054	0.0056	0.0060	0.0063	0.0067	0.0070	0.0069	0.0066	0.0062	0.0055	0.0051
Vapor Molecular Weight (lb/lb-mole):	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Daily Avg. Liquid Surface Temp. (deg. R):	517.7099	519.2067	520.4628	522.5955	524.4110	526.3679	527.5466	527.2672	525.9040	523.5488	520.0120	517.5081
Daily Average Ambient Temp. (deg. F):	51.0500	52.5500	52.7500	54.7000	57.1000	60.6500	63.1000	64.0000	63.5500	60.9500	55.5000	51.0000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517
Tank Paint Solar Absorptance (Shell):	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900
Tank Paint Solar Absorptance (Roof):	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	899.7777	1,171.3608	1,550.4985	1,964.2186	2,210.7374	2,338.9144	2,371.5933	2,152.3597	1,774.1738	1,381.0763	1,011.4568	841.4000
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0717	0.0783	0.0879	0.1053	0.1086	0.1133	0.1150	0.1072	0.0986	0.0912	0.0782	0.0716
Daily Vapor Temperature Range (deg. R):	28.1856	30.2873	33.4194	39.0173	39.5493	40.4449	40.5858	38.0478	35.5740	33.7294	30.0531	28.1961
Daily Vapor Pressure Range (psia):	0.3018	0.3396	0.3896	0.4860	0.5196	0.5628	0.5843	0.5426	0.4871	0.4308	0.3451	0.3001
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.4799	0.4968	0.5052	0.5185	0.5502	0.5845	0.6082	0.6158	0.6001	0.5617	0.5122	0.4764
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.7817	0.8363	0.8948	1.0045	1.0698	1.1473	1.1925	1.1583	1.0871	0.9925	0.8574	0.7765
Daily Avg. Liquid Surface Temp. (deg R):	517.7099	519.2067	520.4628	522.5955	524.4110	526.3679	527.5466	527.2672	525.9040	523.5488	520.0120	517.5081
Daily Min. Liquid Surface Temp. (deg R):	510.6636	511.6349	512.1080	512.8412	514.5237	516.2567	517.4002	517.7552	517.0105	515.1165	512.4988	510.4591
Daily Max. Liquid Surface Temp. (deg R):	524.7563	526.7785	528.8177	532.3498	534.2983	536.4792	537.6931	536.7791	534.7975	531.9812	527.5253	524.5571
Daily Ambient Temp. Range (deg. R):	25.5000	24.3000	22.9000	24.4000	21.4000	20.7000	20.4000	20.2000	22.5000	25.9000	26.4000	26.4000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.8194	0.8116	0.8050	0.7933	0.7831	0.7718	0.7648	0.7665	0.7745	0.7880	0.8074	0.8204
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Vapor Space Outage (ft):	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636	6.7636
Working Losses (lb):	1.8943	1.6484	0.3623	1.3616	2.5218	0.3870	0.0000	2.4401	0.7909	0.5626	0.7636	0.0000
Vapor Molecular Weight (lb/lb-mole):	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Net Throughput (gal/mo.):	2,809.0000	2,321.3300	488.6700	1,708.0000	2,975.3300	427.6700	0.0000	2,617.0000	887.6700	683.3300	1,046.0000	0.0000
Annual Turnovers:	4.4362	4.4362	4.4362	4.4362	4.4362	4.4362	4.4362	4.4362	4.4362	4.4362	4.4362	4.4362
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635	3,598.5635
Maximum Liquid Height (ft):	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000
Tank Diameter (ft):	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	4.3118	4.1293	3.5437	5.2573	6.8635	4.9812	4.9568	7.0295	4.7445	4.1303	3.4736	2.4017

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T1075_ahe_monthly - Vertical Fixed Roof Tank
Santa Maria, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Ethyl alcohol	12.73	43.09	55.82

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	T2109_ahe
City:	Santa Maria
State:	California
Company:	Constellation Brands U.S. Operations, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Ethanol storage tank with 15,802 gal capacity

Tank Dimensions

Shell Height (ft):	16.50
Diameter (ft):	10.50
Liquid Height (ft) :	16.50
Avg. Liquid Height (ft):	8.25
Volume (gallons):	10,687.73
Turnovers:	5.42
Net Throughput(gal/yr):	57,932.68
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Santa Maria, California (Avg Atmospheric Pressure = 14.62 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T2109_ahe - Vertical Fixed Roof Tank
Santa Maria, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	Jan	58.04	50.99	65.09	58.58	0.6148	0.4799	0.7817	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Feb	59.54	51.96	67.11	58.58	0.6474	0.4968	0.8363	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Mar	60.79	52.44	69.15	58.58	0.6759	0.5052	0.8948	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Apr	62.93	53.17	72.68	58.58	0.7268	0.5185	1.0045	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	May	64.74	54.85	74.63	58.58	0.7727	0.5502	1.0698	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Jun	66.70	56.59	76.81	58.58	0.8250	0.5845	1.1473	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Jul	67.88	57.73	78.02	58.58	0.8580	0.6082	1.1925	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Aug	67.60	58.09	77.11	58.58	0.8500	0.6158	1.1583	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Sep	66.23	57.34	75.13	58.58	0.8123	0.6001	1.0871	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Oct	63.88	55.45	72.31	58.58	0.7506	0.5617	0.9925	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Nov	60.34	52.83	67.86	58.58	0.6655	0.5122	0.8574	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Dec	57.84	50.79	64.89	58.58	0.6105	0.4764	0.7765	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T2109_ahe - Vertical Fixed Roof Tank
Santa Maria, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	6.6859	6.8465	8.7635	10.6963	11.8870	12.5391	13.5026	12.5076	10.7986	9.7811	7.4698	6.6442
Vapor Space Volume (cu ft):	758.1874	758.1874	758.1874	758.1874	758.1874	758.1874	758.1874	758.1874	758.1874	758.1874	758.1874	758.1874
Vapor Density (lb/cu ft):	0.0051	0.0054	0.0056	0.0060	0.0063	0.0067	0.0070	0.0069	0.0066	0.0062	0.0055	0.0051
Vapor Space Expansion Factor:	0.0717	0.0783	0.0879	0.1053	0.1086	0.1133	0.1150	0.1072	0.0986	0.0912	0.0782	0.0716
Vented Vapor Saturation Factor:	0.7780	0.7690	0.7612	0.7478	0.7361	0.7231	0.7152	0.7171	0.7262	0.7417	0.7640	0.7792
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	758.1874	758.1874	758.1874	758.1874	758.1874	758.1874	758.1874	758.1874	758.1874	758.1874	758.1874	758.1874
Tank Diameter (ft):	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000
Vapor Space Outage (ft):	8.7560	8.7560	8.7560	8.7560	8.7560	8.7560	8.7560	8.7560	8.7560	8.7560	8.7560	8.7560
Tank Shell Height (ft):	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000
Average Liquid Height (ft):	8.2500	8.2500	8.2500	8.2500	8.2500	8.2500	8.2500	8.2500	8.2500	8.2500	8.2500	8.2500
Roof Outage (ft):	0.5060	0.5060	0.5060	0.5060	0.5060	0.5060	0.5060	0.5060	0.5060	0.5060	0.5060	0.5060
Roof Outage (Dome Roof)												
Roof Outage (ft):	0.5060	0.5060	0.5060	0.5060	0.5060	0.5060	0.5060	0.5060	0.5060	0.5060	0.5060	0.5060
Dome Radius (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Shell Radius (ft):	5.2500	5.2500	5.2500	5.2500	5.2500	5.2500	5.2500	5.2500	5.2500	5.2500	5.2500	5.2500
Vapor Density												
Vapor Density (lb/cu ft):	0.0051	0.0054	0.0056	0.0060	0.0063	0.0067	0.0070	0.0069	0.0066	0.0062	0.0055	0.0051
Vapor Molecular Weight (lb/lb-mole):	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Daily Avg. Liquid Surface Temp. (deg. R):	517.7099	519.2067	520.4628	522.5955	524.4110	526.3679	527.5466	527.2672	525.9040	523.5488	520.0120	517.5081
Daily Average Ambient Temp. (deg. F):	51.0500	52.5500	52.7500	54.7000	57.1000	60.6500	63.1000	64.0000	63.5500	60.9500	55.5000	51.0000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517	518.2517
Tank Paint Solar Absorptance (Shell):	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900
Tank Paint Solar Absorptance (Roof):	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	899.7777	1,171.3608	1,550.4985	1,964.2186	2,210.7374	2,338.9144	2,371.5933	2,152.3597	1,774.1738	1,381.0763	1,011.4568	841.4000
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0717	0.0783	0.0879	0.1053	0.1086	0.1133	0.1150	0.1072	0.0986	0.0912	0.0782	0.0716
Daily Vapor Temperature Range (deg. R):	28.1856	30.2873	33.4194	39.0173	39.5493	40.4449	40.5858	38.0478	35.5740	33.7294	30.0531	28.1961
Daily Vapor Pressure Range (psia):	0.3018	0.3396	0.3896	0.4860	0.5196	0.5628	0.5843	0.5426	0.4871	0.4308	0.3451	0.3001
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.4799	0.4968	0.5052	0.5185	0.5502	0.5845	0.6082	0.6158	0.6001	0.5617	0.5122	0.4764
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.7817	0.8363	0.8948	1.0045	1.0698	1.1473	1.1925	1.1583	1.0871	0.9925	0.8574	0.7765
Daily Avg. Liquid Surface Temp. (deg R):	517.7099	519.2067	520.4628	522.5955	524.4110	526.3679	527.5466	527.2672	525.9040	523.5488	520.0120	517.5081
Daily Min. Liquid Surface Temp. (deg R):	510.6636	511.6349	512.1080	512.8412	514.5237	516.2567	517.4002	517.7552	517.0105	515.1165	512.4988	510.4591
Daily Max. Liquid Surface Temp. (deg R):	524.7563	526.7785	528.8177	532.3498	534.2983	536.4792	537.6931	536.7791	534.7975	531.9812	527.5253	524.5571
Daily Ambient Temp. Range (deg. R):	25.5000	24.3000	22.9000	24.4000	21.4000	20.7000	20.4000	20.2000	22.5000	25.9000	26.4000	26.4000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.7780	0.7690	0.7612	0.7478	0.7361	0.7231	0.7152	0.7171	0.7262	0.7417	0.7640	0.7792
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Vapor Space Outage (ft):	8.7560	8.7560	8.7560	8.7560	8.7560	8.7560	8.7560	8.7560	8.7560	8.7560	8.7560	8.7560
Working Losses (lb):	1.2831	3.6945	4.7593	2.4216	0.7953	5.8887	3.2521	6.1114	5.2155	1.7789	7.1568	4.0828
Vapor Molecular Weight (lb/lb-mole):	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6148	0.6474	0.6759	0.7268	0.7727	0.8250	0.8580	0.8500	0.8123	0.7506	0.6655	0.6105
Net Throughput (gal/mo.):	1,902.6700	5,202.6700	6,419.6700	3,037.6700	938.3300	6,507.3300	3,455.6700	6,554.3300	5,853.3300	2,160.6700	9,803.6700	6,096.6700
Annual Turnovers:	5.4205	5.4205	5.4205	5.4205	5.4205	5.4205	5.4205	5.4205	5.4205	5.4205	5.4205	5.4205
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	10,687.7335	10,687.7335	10,687.7335	10,687.7335	10,687.7335	10,687.7335	10,687.7335	10,687.7335	10,687.7335	10,687.7335	10,687.7335	10,687.7335
Maximum Liquid Height (ft):	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000
Tank Diameter (ft):	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	7.9690	10.5410	13.5228	13.1179	12.6822	18.4278	16.7547	18.6189	16.0141	11.5600	14.6266	10.7269

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T2109_ahe - Vertical Fixed Roof Tank
Santa Maria, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Ethyl alcohol	46.44	118.12	164.56

Attachment 4:

BACT cost effectiveness analysis

Constellation Brands U.S. Operations, Inc.
dba Gonzales Winery
Ethanol Storage Tank - BACT Analysis

	Case 1: Thermal Oxidizer or RTO	Case 2: Refrigerated Condenser	Case 3: Water Scrubber	Case 4: Carbon Adsorption
Capital Cost (TCI)	$954,313	$461,089	$209,548	$50,112
Annual Operating Costs	$86,734	$36,146	$31,558	$35,254
Expected Equipment Life	*10*	*15*	*15*	*10*
	8.11	*11.12*	*11.12*	*8.11*
Present Value	*$1,657,807*	*$862,970*	*$560,417*	*$336,050*

Uncontrolled Emissions (TPY)	0.6385	0.6385	0.6385	0.6385
Expected Control Efficiency	0.98	0.70	0.70	0.95
Controlled Emissions (TPY)	0.6257	0.4470	0.4470	0.6066
Cost Effectiveness ($/ton)	**$264,935**	**$128,718**	**$83,590**	**$55,400**

Cost Effectiveness Threshold ($/ton)	**$40,854**

Notes:
Ducting and Clean-in-Place capital costs have been added into the control costs summarized above.
Expected equipment life as defined by EPA and control vendors.

Case 1: RTO: Preliminary quote for the smaller system, 1000 scfm at $450,000 for equipment cost per Adwest/CECO Environmental telephone conversation (3/1/2024).

Case 2: Refrigerated Condenser - The EcoPas condenser has been used for larger fermentation systems. Per the vendor, this system is not designed to efficiently handle the small/infrequent volumes to be released from these tanks. No quote or potential design specifications were provided by the vendor at this time. Costs defined by EcoPas in 2017 for their smallest single control unit have been applied for reference.

Case 3: Water Scrubber: NoMoVo has indicated that while their scrubbers have not been used for storage, one scrubber could be used to manage the volumes emitted from the five tanks. NoMoVo provided an initial cost for the control equipment (03.15.2024), supporting equipment costs as provided by NoMoVo in 2017 for a single scrubber have been applied.

Case 4: Carbon Adsorption: Carbtrol provided carbon costs (3.15.2024) - The calculation to determine the expected replacement frequency is consistent with the SJVAPCD BACT Analysis for a Distilled Spirits Tank (Project N-1153264).

Support Equipment

	Ducting	Clean-in-Place
Capital Cost (TCI)	$28,486	$19,378

BACT Cost Effectiveness Calculation based on South Coast AQMD Discounted Cash Flow Method:
Discounted Cash Flow Method
The discounted cash flow method (DCF) is used in the MSBACT Guidelines. This is also the method used in South Coast AQMD's Air Quality Management Plan. The DCF method calculates the present value of the control costs over the life of the equipment by adding the capital cost to the present value of all annual costs and other periodic costs over the life of the equipment. A real interest rate of four percent, and a 10-year equipment life is used. The cost effectiveness is determined by dividing the total present value of the control costs by the total emission reductions in tons over the same 10-year equipment life. The 10 year and 4% are default values that are used but for case-specific situations other values may be considered.
https://www.aqmd.gov/home/permits/bact/cost-effectiveness-values

Interest Rate	0.04	4.00%	SCAQMD	i

Support/Auxiliary Equipment
Ductwork Capital Costs

Cost Quantification:

Cost Category	Project Cost	Default Estimate	Default % Applied	EPA Equation / Estimate Basis	Reference
Direct Capital Costs					
Purchased Equipment:					
Purchased Control Equipment	$14,989		-	A	Ducting Cost Estimate, See Below
Instrumentation & Controls	$1,499	$1,499	10%	C = 0.10 x A	EPA
Freight	$749	$749	5%	D = 0.05 x (A+B)	EPA
Taxes (Enter sales tax rate in "% Applied")	$495	$495	3.0%	TaxRate x (A+B+C)	EPA
Total Purchased Equipment Cost (PE)	$17,732		-	PE	
Direct Installation Costs:					
Foundation & Supports	$1,419	$1,419	8%	0.08 x PE	EPA
Erection and Handling	$2,482	$2,482	14%	0.14 x PE	EPA
Electrical	$709	$709	4%	0.04 x PE	EPA
Ducting and Clean-in-Place capital costs have been added into the control costs summarized above.	$0	$0	0%	0.00 x PE	Default 2%. This project is for ducting, so zero.
Insulation & Ductwork	$0	$0	0%	0.00 x PE	Default 1%. This project is for ducting, so zero.
Total Direct Installation Cost (DI)	$4,610		-	DI	
Total Direct Capital Costs (DC)	**$22,342**		-	**DC = PE + DI**	
Indirect Capital Costs					
Indirect Costs:					
Engineering & Supervision	$1,773	$1,773	10%	0.10 x PE	EPA
Construction and Field Expenses	$887	$887	5%	0.05 x PE	EPA
Contractor Fees	$1,773	$1,773	10%	0.10 x PE	EPA
Startup	$355	$355	2%	0.02 x PE	EPA
Performance Testing	$0	$0	0%	0.00 x PE	No Performance Testing for Ducting?
Total Indirect Costs (TIC)	**$4,788**		-	IC	
Capital Investment:					
Project Contingency	$ 1,356	$1,356.50	5%	E = 0.05 x (DC+IC)	EPA
Total Capital Investment	**$28,486**		-	**TCI = DC + IC + E + F + G**	

Notes:

Cost data per Ducting Systems, and Project N-1153264

	Price per Unit	Number	Total	Source
Knockout Drum			$ 5,000.00	Project N-1153264
Tank Ducting	$235	1	$ 235.00	Ducting Systems
Structural Support			$ 6,000.00	Project N-1153264
Buttefly Valves	$206.20	5	$ 1,031.00	Ducting Systems
Spool	$544.60	5	$ 2,723.00	Ducting Systems
			$ 14,989.00	

Note:

Gallo included $20,000 for explosion safety concerns. These have not been added to this analysis.

https://www.ductingsystems.com/nordfab-parts-flanged-pipe.html

3201-03LW-20000 /		03" x 59" LONG FLANGED PIPE, 304 STAINLESS STEEL	
	8040206849	22 GAUGE LASER WELDED	$235
3208-0300-20000 /		03" BUTTERFLY VALVE, 304 STAINLESS STEEL	$206.20
	8010005235	L=8"	
3205-0300-20000 /		03" VIEWING SPOOL, 304 STAINLESS STEEL	$544.60
	8010005352	L=12.5"	

Tank Farm Size	Ducting Length	Design Duct Velocity (Eichleay)	Nominal Duct Size	Standard Size of Pipe	Number of Tanks to Connect
gal	ft	ft/sec	inches		
37402	25	40	0.71	3	5

Support/Auxiliary Equipment
Clean In Place System Capital Costs

Cost Quantification:

Cost Category	Project Cost	Default Estimate	Default % Applied	EPA Equation / Estimate Basis	Reference
Direct Capital Costs					
Purchased Equipment:					
Purchased Control Equipment	$10,000		-	A	Clean In Place System, per SJVAPCD N-1153264
Instrumentation & Controls	$1,000	$1,000	10%	C = 0.10 x A	EPA
Freight	$500	$500	5%	D = 0.05 x (A+B)	EPA
Taxes (Enter sales tax rate in "% Applied")	$330	$330	3.0%	TaxRate x (A+B+C)	EPA
Total Purchased Equipment Cost (PE)	$11,830		-	PE	
Direct Installation Costs:					
Foundation & Supports	$946	$946	8%	0.08 x PE	EPA
Erection and Handling	$1,656	$1,656	14%	0.14 x PE	EPA
Electrical	$473	$473	4%	0.04 x PE	EPA
Ducting and Clean-in-Place capital costs have been added into the control costs summarized above.	$237	$237	2%	0.02 x PE	EPA
Insulation & Ductwork	$0	$0	0%	0.00 x PE	Existing BACT Analysis Specified Ductwork below
Total Direct Installation Cost (DI)	$3,312		-	DI	
Total Direct Capital Costs (DC)	**$15,142**		-	**DC = PE + DI**	
Indirect Capital Costs					
Indirect Costs:					
Engineering & Supervision	$1,183	$1,183	10%	0.10 x PE	EPA
Construction and Field Expenses	$592	$592	5%	0.05 x PE	EPA
Contractor Fees	$1,183	$1,183	10%	0.10 x PE	EPA
Startup	$237	$237	2%	0.02 x PE	EPA
Performance Testing	$118	$118	1%	0.01 x PE	EPA
Total Indirect Costs (TIC)	**$3,312**		-	IC	
Capital Investment:					
Project Contingency	$ 923	$922.74	5%	E = 0.05 x (DC+IC)	EPA
Total Capital Investment	**$19,378**		-	**TCI = DC + IC + E + F + G**	

Case 1
Regenerative Thermal Oxidizer Cost Effectiveness Analysis

Cost Quantification:

Cost Category	Project Cost	Default Estimate	Default % Applied	EPA Equation / Estimate Basis	Reference
Direct Capital Costs					
Purchased Equipment:					
Purchased Control Equipment	$450,000		-	A	Preliminary Adwest/CECO Quote
				B	
Instrumentation & Controls	$45,000	$45,000	10%	C = 0.10 x A	EPA
Freight	$22,500	$22,500	5%	D = 0.05 x (A+B)	EPA
Taxes (Enter sales tax rate in "% Applied")	$35,888	$35,888	7.3%	TaxRate x (A+B+C)	California state-wide tax rate
Total Purchased Equipment Cost (PE)	$553,388		-	PE	
Direct Installation Costs:					
Foundation & Supports	$44,271	$44,271	8%	0.08 x PE	EPA
Erection and Handling	$77,474	$77,474	14%	0.14 x PE	Other
Electrical	$22,136	$22,136	4%	0.04 x PE	EPA
Ducting and Clean-in-Place capital costs have been added into the control costs summarized above.	$11,068	$11,068	2%	0.02 x PE	EPA
Insulation & Ductwork	$0	$0	0%	0.00 x PE	
Total Direct Installation Cost (DI)	$154,949		-	DI	
Total Direct Capital Costs (DC)	**$708,336**		-	**DC = PE + DI**	

Indirect Capital Costs					
Indirect Costs:					
Engineering & Supervision	$55,339	$55,339	10%	0.10 x PE	EPA
Construction and Field Expenses	$27,669	$27,669	5%	0.05 x PE	EPA
Contractor Fees	$55,339	$55,339	10%	0.10 x PE	EPA
Startup	$11,068	$11,068	2%	0.02 x PE	EPA
Performance Testing	$5,534	$5,534	1%	0.01 x PE	EPA
Total Indirect Costs (TIC)	**$154,949**		-	IC	

Capital Investment:					
Project Contingency	$ 43,164	$43,164.23	5%	E = 0.05 x (DC+IC)	EPA
Total Capital Investment	**$906,449**		-	**TCI = DC + IC + E + F + G**	

Direct Annual Costs					
Direct Annual Costs:					
Operating Labor	$ 6,142		$ 34.12	0.5 hr/shift, 360 day/yr	Bureau of Labor Statistics, May 2022, Plant & System Operators labor rate in CA
Supervisory Labor	$ 921	$921	15%	Included in Maintenance Labor	EPA
Maintenance Labor	$ 6,473		$ 35.96	0.5 hr/shift, 360 day/yr	Bureau of Labor Statistics, May 2022, Electrical & Electronics Commercial and Industrial Equipment Repairers in CA
Maintenance Materials	$ 6,473	$0		100% of Maintenance Labor	OAQPS
Utilities (Fuel & Electricity)	$ 9,398		-		Preliminary estimate
Total Direct Annual Costs	**$29,407**		-	**DAC**	

Indirect Annual Costs					
Indirect Annual Costs:					
Overhead		$12,005	60.0%	0.600 x Op/Super/Maint Labor & Mtls	EPA
Property Tax		$18,129	2.0%	0.0200 x TCI	EPA
Insurance		$9,064	1.0%	0.010 x TCI	EPA
General Administrative		$18,129	2.0%	0.020 x TCI	EPA
Total Indirect Annual Costs	**$57,328**		-	**DAC**	

Notes:

Operating Labor Rates based on Bureau of Labor and Statistics, May 2022, Plant and System Operators in California.
https://www.bls.gov/oes/tables.htm

Maintenance Labor Rates based on Bureau of Labor and Statistics, May 2022, Electrical & Electronics Commercial and Industrial Equipment Repairers in CA
https://www.bls.gov/oes/tables.htm

Case 2
Refrigerated Condenser Cost Effectiveness Analysis

Cost Quantification:

Cost Category	Project Cost	Default Estimate	Default % Applied	EPA Equation / Estimate Basis	Reference
Direct Capital Costs					
Purchased Equipment:					
Purchased Control Equipment	$270,000		-	A	Vendor Quote (2017, EcoPas-100)
				B	
Instrumentation & Controls	$1,850	$27,000	10%	C = 0.10 x A	Vendor Quote (2017, EcoPas-100)
Freight	$1,500	$13,500	5%	D = 0.05 x (A+B)	Vendor Quote (2017, EcoPas-100)
Taxes (Enter sales tax rate in "% Applied")	$8,156	$8,156	3.0%	TaxRate x (A+B+C)	EPA
Total Purchased Equipment Cost (PE)	$281,506		-	PE	
Direct Installation Costs:					
Foundation & Supports	$10,200	$39,411	14%	0.14 x PE	Vendor Quote (2017, EcoPas-100)
Erection and Handling	$21,093	$22,520	8%	0.08 x PE	Vendor Quote (2017, EcoPas-100)
Electrical	$4,743	$22,520	8%	0.08 x PE	Vendor Quote (2017, EcoPas-100)
Ducting and Clean-in-Place capital costs have been added into the control costs summarized above.	$5,630	$5,630	2%	0.02 x PE	EPA, Section 2, Ch. 2
Insulation	$0	$0	0%	0.00 x PE	Included with EcoPas Quote
Insulation & Ductwork	$0	$0	0%	0.00 x PE	Included with EcoPas Quote
Total Direct Installation Cost (DI)	$41,666		-	DI	
Total Direct Capital Costs (DC)	**$323,172**		-	**DC = PE + DI**	

Indirect Capital Costs					
Indirect Costs:					
Engineering & Supervision	$28,151	$28,151	10%	0.10 x PE	EPA, Section 2, Ch. 2
Construction and Field Expenses	$14,075	$14,075	5%	0.05 x PE	EPA
Contractor Fees	$28,151	$28,151	10%	0.10 x PE	EPA
Startup	$0	$0	0%	0.00 x PE	Included with EcoPas Quote
Performance Testing	$0	$0	0%	0.00 x PE	Not Applicable
Total Indirect Costs (TIC)	**$70,376**		-	IC	

Capital Investment:					
Project Contingency	$ 19,677	$19,677.40	5%	E = 0.05 x (DC+IC)	EPA
Total Capital Investment	**$413,225**		-	**TCI = DC + IC + E + F + G**	

Direct Annual Costs					
Direct Annual Costs:					
Operating Labor	$ 6,142		$ 34.12	0.5 hr/day x 360 days/year	Bureau of Labor Statistics, May 2022, Plant & System Operators labor rate in CA
Supervisory Labor	$ 921	$921	15%		EPA
Maintenance Labor	$ 1,798		$ 35.96	50 hrs/year (per Vendor)	Bureau of Labor Statistics, May 2022, Electrical & Electronics Commercial and Industrial Equipment Repairers in CA
Maintenance Materials	$ 120				Vendor Quote (2017, EcoPas-100)
Glycol Chiller	$ 650				Vendor Quote (2017, EcoPas-100)
Utilities (Electricity)	$ 75		-		Vendor Quote (2017, EcoPas-100)
Total Direct Annual Costs	**$9,706**		-	**DAC**	

Indirect Annual Costs					
Indirect Annual Costs:					
Overhead		$5,779	60.0%	0.600 x Op/Super/Maint Labor & Mtls	EPA, Section 2, Ch. 2
Property Tax		$8,265	2.0%	0.0200 x TCI	EPA
Insurance		$4,132	1.0%	0.010 x TCI	EPA
General Administrative		$8,265	2.0%	0.020 x TCI	EPA
Total Indirect Annual Costs	**$26,440**		-	**DAC**	

Notes:

Operating Labor Rates based on Bureau of Labor and Statistics, May 2022, Plant and System Operators in California.
https://www.bls.gov/oes/tables.htm

Maintenance Labor Rates based on Bureau of Labor and Statistics, May 2022, Electrical & Electronics Commercial and Industrial Equipment Repairers in CA
https://www.bls.gov/oes/tables.htm

Case 3
Water Scrubber Cost Effectiveness

Cost Quantification:

Cost Category	Project Cost	Default Estimate	Default % Applied	EPA Equation / Estimate Basis	Reference
Direct Capital Costs					
Purchased Equipment:					
Purchased Control Equipment	$75,000		-	A	Vendor Quote (3/15/2024, NoMoVo Quote per Unit)
Slurry Storage tank	$40,000			B	Vendor Quote (2017, NoMoVo Quote per Unit)
Instrumentation & Controls	$0	$7,500	10%	C = 0.10 x A	Included in NoMoVo Quote
Freight	$0	$5,750	5%	D = 0.05 x (A+B)	Included in NoMoVo Quote
Taxes (Enter sales tax rate in "% Applied")	$3,450	$3,450	3.0%	TaxRate x (A+B+C)	Per EPA
Total Purchased Equipment Cost (PE)	$118,450		-	PE	
Direct Installation Costs:					
Foundation & Supports	$0	$16,583	14%	0.14 x PE	Not Applicable
Erection and Handling	$4,738	$4,738	4%	0.04 x PE	EPA, Wet Scrubbers, Section 6, ch. 2
Electrical	$1,185	$1,185	1%	0.01 x PE	Vendor Quote (2017, NoMoVo Quote per Unit)
Ducting and Clean-in-Place capital costs have been added into the control costs summarized above.	$5,923	$5,923	5%	0.05 x PE	EPA, Wet Scrubbers, Section 6, ch. 2
Insulation	$0	$0	0%	0.00 x PE	Included in NoMoVo Quote
Insulation & Ductwork	$0	$0	0%	0.00 x PE	Included in NoMoVo Quote
Total Direct Installation Cost (DI)	$11,845		-	DI	
Total Direct Capital Costs (DC)	**$130,295**		-	**DC = PE + DI**	
Indirect Capital Costs					
Indirect Costs:					
Engineering & Supervision	$11,845	$11,845	10%	0.10 x PE	EPA, Wet Scrubbers, Section 6, ch. 2
Construction and Field Expenses	$0	$5,923	5%	0.05 x PE	Included in Handling and Erection
Contractor Fees	$11,845	$11,845	10%	0.10 x PE	EPA, Wet Scrubbers, Section 6, ch. 2
Startup	$0	$0	0%	0.00 x PE	Included in Handling and Erection
Performance Testing	$0	$0	0%	0.00 x PE	Not Applicable
Total Indirect Costs (TIC)	**$23,690**		-	IC	

Capital Investment:					
Project Contingency	$ 7,699	$7,699.25	5%	E = 0.05 x (DC+IC)	EPA, Wet Scrubbers, Section 6, ch. 2
Total Capital Investment	**$161,684**		-	**TCI = DC + IC + E + F + G**	

Direct Annual Costs					
Direct Annual Costs:					
Operating Labor	$ 3,685		$ 34.12	0.3 hr/day per vendor	Bureau of Labor Statistics, May 2022, Plant & System Operators labor rate in CA
Supervisory Labor	$ 553	$553	15%	Included in Maintenance Labor	EPA
Maintenance Labor	$ 1,798		$ 35.96	1 hr/week, 50 weeks/yr	Bureau of Labor Statistics, May 2022, Electrical & Electronics Commercial and Industrial Equipment Repairers in CA
Maintenance Materials: Chemicals	$ 234			Makeup slurry (80 gal/day/unit*$0.008/gallon)	Vendor Quote
Wastewater Disposal	$ 2,336			Makeup slurry (80 gal/day/unit*$0.08/gallon)	Vendor Quote
Chiller (Glycol System)	$ 2,361				Vendor Quote
Utilities (Electricity)	$ 3,705	16,114	$ 0.23	$/kWh * kWh/yr	Vendor Quote, assumes 2.5 hp
Total Direct Annual Costs	**$14,671**		-	**DAC**	

Indirect Annual Costs					
Indirect Annual Costs:					
Overhead		$8,802	60.0%	0.600 x Op/Super/Maint Labor & Mtls	EPA
Property Tax		$3,234	2.0%	0.0200 x TCI	EPA
Insurance		$1,617	1.0%	0.010 x TCI	EPA
General Administrative		$3,234	2.0%	0.020 x TCI	EPA
Total Indirect Annual Costs	**$16,887**		-	**DAC**	

Notes:

Operating Labor Rates based on Bureau of Labor and Statistics, May 2022, Plant and System Operators in California.
https://www.bls.gov/oes/tables.htm

Maintenance Labor Rates based on Bureau of Labor and Statistics, May 2022, Electrical & Electronics Commercial and Industrial Equipment Repairers in CA
https://www.bls.gov/oes/tables.htm

22.99 cents/kWh Table 7, Average Commercial Sector price, CA, 2022, EIA, https://www.eia.gov/electricity/sales_revenue_price/

Case 4
Carbon Adsorption Cost Effectiveness Analysis

Cost Quantification:

Cost Category	Project Cost	Default Estimate	Default % Applied	EPA Equation / Estimate Basis	Reference
Direct Capital Costs					
Purchased Equipment:					
Purchased Control Equipment	$1,175		-	A	Carbtrol quote for one initial canister
				B	
Instrumentation & Controls	$118	$118	10%	C = 0.10 x A	EPA
Freight	$59	$59	5%	D = 0.05 x (A+B)	EPA
Taxes (Enter sales tax rate in "% Applied")	$39	$39	3.0%	TaxRate x (A+B+C)	EPA
Total Purchased Equipment Cost (PE)	$1,390		-	PE	
Direct Installation Costs:					
Foundation & Supports	$111	$111	8%	0.08 x PE	EPA, Section 3, Ch. 1
Erection and Handling	$195	$195	14%	0.14 x PE	EPA
Electrical	$56	$56	4%	0.04 x PE	EPA
Ducting and Clean-in-Place capital costs have been added into the control costs summarized above.	$28	$28	2%	0.02 x PE	EPA
Insulation & Ductwork	$14	$14	1%	0.01 x PE	EPA
Total Direct Installation Cost (DI)	$403		-	DI	
Total Direct Capital Costs (DC)	**$1,793**		-	**DC = PE + DI**	
Indirect Capital Costs					
Indirect Costs:					
Engineering & Supervision	$139	$139	10%	0.10 x PE	EPA, Section 3, Ch. 1
Construction and Field Expenses	$70	$70	5%	0.05 x PE	EPA
Contractor Fees	$139	$139	10%	0.10 x PE	EPA
Startup	$28	$28	2%	0.02 x PE	EPA
Performance Testing	$14	$14	1%	0.01 x PE	EPA
Total Indirect Costs (TIC)	**$389**		-	IC	
Capital Investment:					
Project Contingency	$ 65	$65.47	3%	E = 0.03 x (DC+IC)	EPA, Section 3, Ch. 1
Total Capital Investment	**$2,248**		-	**TCI = DC + IC + E + F + G**	

Direct Annual Costs					
Direct Annual Costs:					
Operating Labor	$ 6,142		$ 34.12	0.5 hr/day x 360 days/year	Bureau of Labor Statistics, May 2022, Plant & System Operators labor rate in CA
Supervisory Labor	$ 921	$921	15%	Included in Maintenance Labor	EPA
Maintenance Labor	$ 432		$ 35.96	Estimated monthly replacement of carbon	Bureau of Labor Statistics, May 2022, Electrical & Electronics Commercial and Industrial Equipment Repairers in CA
Maintenance Materials	$ 432			100% of Maintenance Labor	OAQPS
Replacement Labor					
Carbon Cost	$ 12,556	2137.22	$5.88	Carbon cost per pound	Carbtrol Quote, 3/2024
Electricity	$ 1,481	6,443	$ 0.23	$/kWh * kWh/yr	Estimated 1 hp fan from SJVAPCD GEAR Example
Total Direct Annual Costs	**$21,963**		-	**DAC**	

Indirect Annual Costs					
Indirect Annual Costs:					
Overhead		$13,178	60.0%	0.600 x Op/Super/Maint Labor & Mtls	EPA
Property Tax		$45	2.0%	0.0200 x TCI	EPA
Insurance		$22	1.0%	0.010 x TCI	EPA
General Administrative		$45	2.0%	0.020 x TCI	EPA
Total Indirect Annual Costs	**$13,290**		-	**DAC**	

Notes:

Operating Labor Rates based on Bureau of Labor and Statistics, May 2022, Plant and System Operators in California.
https://www.bls.gov/oes/tables.htm

Maintenance Labor Rates based on Bureau of Labor and Statistics, May 2022, Electrical & Electronics Commercial and Industrial Equipment Repairers in CA
https://www.bls.gov/oes/tables.htm

22.99 cents/kWh Table 7, Average Commercial Sector price, CA, 2022, EIA, https://www.eia.gov/electricity/sales_revenue_price/

Lisa Kiehl

From: Patrick Thompson <pt@aromatica.io>
Sent: Wednesday, March 13, 2024 3:47 PM
To: Lisa Kiehl
Subject: RE: RFQ EcoPas chilled condenser
Attachments: Pages from chapter5.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Lisa,

This does appear to be a new control focus on emissions during tank fills (tank “turnovers" and not normal "breathing” losses). This may be like the oil & gas focus on refilling underground gasoline station tanks, and for the tanker trucks that transport the fuel. In these cases, the vapor released during refill of the underground tank is returned to the truck -- and when the truck returns to the refinery, its vapor contents must be captured and returned to a liquid state.

The SJVUSPCD AIP BACT for Guideline 5.4.15 appears to be unchanged, except the district may have added a few more 'technologically feasible” controls. So the engineering challenge would be how to deal with the displaced vapor-saturated contents of the tank. One possibility would be a removable control device deployed on the tank hatch only while the tank is being filled with spirits. The displaced vapor volume would pass through a portable control device based on catalytic oxidation, carbon adsorption, or condensation (however, our passive condensing systems would not work on the vapor volumes during these short turnover times.)

Another option might be a permanent exhaust path with a dedicate capture unit, but this also requires a sealed filling mechanism, since the vapors would seek the path of least resistance. A variant of this might be a common (manifolded) exhaust path, heading to a shared capture device. Also, if the facility is enclosed, an “entire facility” ventilation and capture system might be possible. The easiest and most cost effective method would probably be a carbon bed that is purged after one or more uses. Unfortunately, we have no unique expertise in this area. A solution would be require development and testing- definitely not an existing off-the-shelf product.

Sorry the news isn’t better. Hope this helps,

-PT

-Patrick Thompson

aromatica
innovation for fermentation
mobile: +1 949.436.0318

On Mar 12, 2024 at 4:12 PM -0700, Lisa Kiehl <lkiehl@algcorp.com>, wrote:

Hi Patrick,

Thank you for your quick response.

The tanks are for storage of high proof distilled spirits/ethanol only, no fermentation. The facility has four existing storage tanks (totaling 25,000 gal) the current project will add a fifth tank of 12,000 gal. The district (Monterey Bay) has previously defined BACT as insulation and P/V valves for the existing tanks, however with the addition of this fifth tanks they are now requesting that the facility consider additional controls. I believe that there have been other determinations made in San Joaquin Valley pertaining to controls (RTOs, scrubbers, carbon, and condensers) on distilled spirits tanks, however Monterey Bay is now requesting that the facility obtain site specific cost data.

The max annual emissions from the five tanks would be ~ 1200 lb/year based on AP-42 Tank calculations assuming ethyl alcohol. If all tanks were filled in a single day, the max daily emissions might be 55 lb/day – but that is not a likely scenario. The tanks are equipped with a 140 gpm pump – below I summarize an estimated of max potential emissions (in July with peak temperatures), and estimated exhaust flow rate from the tanks.

Tank Capacity (gal)	Annual Throughput (gal/yr)	Minutes/turnover	One Turnover (VOC lbs)	Max Vapor Density (lb/scf)	scf/turnover	scf
3,200	101,299	23	4.72	0.0110	428	1
3,200	101,299	23	4.72	0.0110	428	1
3,200	101,299	23	4.72	0.0110	428	1
15,802	500,229	113	23.3	0.0110	2,112	1
12,000	379,873	86	17.7	0.0110	1,605	1

David I. Harris

From: Patrick Thompson <pthompson@eco-pas.com>
Sent: Monday, January 8, 2018 12:35 PM
To: David I. Harris
Subject: Re: Cost Data
Attachments: EcoPas Cost Effectiveness Calculations.xlsx

Hi David,

Attached please find the cost estimates as requested. Let us know if you have any questions whatsoever.

Best,

-PT

On Fri, Jan 5, 2018 at 3:59 PM, David I. Harris <HarrisD@sbcapcd.org> wrote:

> Hi Patrick,
>
> Early next week will be fine.
>
> I hope you have a great weekend.
>
> Sincerely,
>
> David Harris
>
> Santa Barbara County APCD
>
> (805) 961-8824
>
> **From:** Patrick Thompson [mailto:pthompson@eco-pas.com]
> **Sent:** Friday, January 5, 2018 12:29 PM
> **To:** David I. Harris <HarrisD@sbcapcd.org>
> **Subject:** Re: Cost Data

Hi David-

We are hoping to get this back to you early next week. Will this work?

Best,

-PT

On Tue, Jan 2, 2018 at 10:48 AM, David I. Harris <HarrisD@sbcapcd.org> wrote:

> Hi Patrick,
>
> I hope you had a great holiday season! I am sending you a revised cost effectiveness spreadsheet, with the cost information we need highlighted in green. Specifically, we are looking for site specific cost data for the CCWS Series 400 tank project. When sizing the PAS control system, please assume a maximum of 8 tank turnovers per year.
>
> If an equipment lifespan greater than 10 years is proposed, please provide a detailed basis for the proposed lifespan.
>
> Please don't worry about filling in the rest of the spreadsheet, as we will finish the capital recovery and cost effectiveness calculations on our end.
>
> Happy New Year!
>
> David Harris
>
> Engineering Supervisor
>
> Santa Barbara County Air Pollution Control District
>
> (805) 961-8824
> *OurAir.org*

> *twitter.com/OurAirSBC*

EcoPAS Cost Effectiveness Per EPA Cost Control Manual for Nonpackaged (Custom) Refrigerated Condenser Systems

CAPITAL COSTS

Purchased Equipment Costs	*Cost ($)* [1,2]	*Input Information / Notes*
EcoPAS Unit(s)	$270,000	PAS-100 system price at time of initial acquisition (2015)
Instrumentation	$1,850	Site specific data: Glycol temperature sensor, pressure sensor in manifold pre-PRV, and self-powered logger
Sales Taxes	$8,100	Estimate of 3% of EcoPAS unit cost. Possible that exempt as "Pollution Control Facility"
Freight	$1,500	Site specific data
Total of Purchased Equipment Cost (PEC)	**$281,450**	Total of previous Purchased Equipment Costs inputs

Direct Installation Costs	*Cost ($)* [1,2,4]	*Input Information / Notes*
Foundations and Support	$10,200	Site specific data
Handling and Erection	$21,093	Site specific data
Electrical	$4,743	Site specific data
Piping	$193,116	Site specific data
Insulation	$0	Included as part of EcoPAS unit cost
Painting	$0	Not applicable
Total of Direct Costs	**$229,152**	Total of previous Direct Installation Costs inputs

Other Direct Costs	*Cost ($)* [1,2]	*Input Information / Notes*
Site Preparation	$0	No site preparation was required
Buildings	$0	No new buildings were required
Total of Other Direct Costs	**$0**	Total of previous Other Direct Costs inputs

Indirect Costs (IC)	*Cost ($)* [1,2]	*Input Information / Notes*
Engineering	$2,400	Site specific data for engineering of system.
Construction and Field Expenses	$14,073	Site specific data was zero, as EcoPAS provided. However, 5% of PEC is used here.
Contractor Fees	$28,145	Site specific data was zero, as EcoPAS is a licensed contractor. However, 10% of PEC is used here.
Start-Up	$0	Site specific data was zero, as EcoPAS provides start-up as part of purchase.
Performance Test	$0	Site specific data was zero with mass balance performance tests incl. in operating labor.
Contingencies	$8,444	Site specific data reflects actual costs incurred in other categories. However, 3% of PEC is used here.
Total Indirect Costs	**$53,061**	Total of previous Total Indirect Costs inputs

TOTAL CAPITAL INVESTMENT (TCI)	**$563,663**	Total of Purchased Equipment Costs, Direct Installation Costs, Other Direct Installation Costs, and Indirect Costs

ANNUAL COSTS

Direct Annual Costs	*Cost ($)* [1,2]	*Input Information / Notes*
Operating Labor	$2,700	Site specific data (0.5 hrs of operating labor/shift cellar crew, 0.5 hrs. lab crew @ $30/hr.)
Operating Labor Supervisor	$405	Site specific data or 15% of Operator based on EPA Cost Control Manual
Maintenance Labor	$1,500	Site specific data (50 man hours annual maintenance cleaning valves, etc.)
Maintenance Material	$120	Site specific data (cleaning supplies: citric acid, etc.)
Chiller (Glycol System)	$650	Site specific data (energy input into house chiller system)
Electricity	$75	Low current sensors, etc.
Total Direct Annual Costs	**$5,450**	Total of previous Direct Annual Costs inputs

Indirect Annual Costs	*Cost ($)* [1,2]	*Input Information / Notes*
Overhead	$2,835	60% of Labor and Maintenance Costs[5]
Administrative Charge	$11,273	Site specific data would imply zero, but 2% of TCI used here.
Property Taxes	$484	Site specific data (As assessed in 2017).
Insurance	$845	Winery PP&E insurance averages 15 basis points per $100 asset value
Annual Source Test(s)	$0	Mass balance testing and reporting included in operating labor
Total Indirect Annual Costs	**$15,438**	Total of previous Indirect Annual Costs inputs

Annual Recovery Credits	*Product Value ($)* [1,4]	*Input Information / Notes*
Recovered ROCs	**$0**	We have demonstrated value, but are leaving at zero for this analysis

Capitol Recovery	*Inputs* [1,2,5]	*Input Information / Notes*
Equipment Life (years)	15	Site specific data
Benchmark Interest Rate (%)	2.750	Department of the Treasury daily treasury yield curve rates for the specified equipment life[6]
Incremental Risk (%)	2.000	SBCAPCD P&P 6100.064, Section 7.1[7]
Interest Rate- Rounded Up (%)	5.000	Calculated value per SBCAPCD P&P 6100.064, Section 7.1
Capital Recovery Factor	0.09634	Calculated value, see EPA Cost Control Manual for Annualized Cash Flow equation
Annualized Capital Recovery	**$54,305**	**TCI * Capitol Recovery Factor**

COST EFFECTIVENESS

Capitol Recovery	*Inputs* [1,2]	*Input Information / Notes*
Total Annual Cost	$75,192	Calculated Value: Total Direct Annual Costs + Total Indirect Annual Costs + Annualized Capitol Recovery - Annual Recovery Credits

Annual Tons Controlled	0.00	Annual Tons of ROC Controlled, see SBCAPCD Winery Calculation Spreadsheet[8]
Cost Effectiveness ($/ton)	**#DIV/0!**	**Calculated Value: Total Annual Cost / Tons Controlled**

District Notes:

1. Red values denotes user inputs.
2. Use site specific data where able.
3. Percentages found in the "Purchased Equipment Costs", "Direct Installation Costs", "Other District Costs", and "Indirect Costs" are from Table 2.3 in the EPA Cost Control Manual (Link: https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution#costmanual).
4. If able, do not include "Direct Installation Costs" as part of the "EcoPAS Unit(s)" PEC cost.
5. Percentages found in the "Direct Annual Costs" and "Indirect Annual Costs" are from Table 2.4 in the EPA Cost Control Manual (Link: https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution#costmanual).
6. Daily Yield Curve Rates from the U.S. Department of the Treasury can be found online at: https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield.
7. SBCAPCD Best Available Policy and Procedure 6100.064 can be found online at: https://www.ourair.org/wp-content/uploads/6100-071-1.pdf.
8. SBCAPCD Winery Calculation Spreadsheet can be found online at: https://www.ourair.org/wineries/.

EcoPAS Notes:

1. Cost estimates reflect site specific data for the capture system currently installed at CCWS, with minor adjustments made to exclusively include all 400-series tanks.
2. The PAS-100 system has been sized as per District instructions of 8 turns/tank/season, and based on based on fermentation load balancing in the range historically observed (as constrained by harvest timing and daily crush capacity limitations).
3. System as installed is designed for resale of condensate, so all materials are food grade. If applicant were instead to plan on destruction or non-food-grade utilization of condensate, material savings could be realized.
4. Value of condensate/byproduct has been demonstrated as high as $60/liter (when sold as an aromatic Wine Spirits Addition), which would equate to ~$30K+/ton of VOC. Condensate value would eliminate or sharply reduce annual costs if processed for sale as a wine blending agent or spirit. However, we are not calculating any byproduct value for this estimate.
5. The EPA Cost Control Manual (Sixth Edition, Section 3.1, Chapter 2, "Refrigerated Condensers," p. 2-24) uses 15 years as the useful life term. The PAS condensation is system comprised primarily of stainless steel, with very few moving parts, is used only ~90 days/year, at very low pressures (less than 0.2 psi), with relatively narrow thermal cycles. For all of these reasons, the actual useful life is estimated to be 20-25 years. However, for the purposes of this modeling, we have left the 15-year assumption in place.

Lisa Kiehl

From: Steve Lair <slair@psg-dallas.com>
Sent: Friday, March 15, 2024 12:33 PM
To: Lisa Kiehl; Dan Belliveau; Mark Boswell; Ad Verkuylen
Cc: Jared Lair
Subject: RE: Requesting Information - Cost Quote on Water Scrubber

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Lisa,

I wanted to get you a budget number today and then follow up hopefully Monday or Tuesday with a formal quote after we receive updated pricing on the purchased components.

The system excluding any vapor gathering manifold duct work would be $75,000.00.

If you could supply us with some details of tank layouts etc. I can give you budgetary numbers on the duct work.

I will follow up as soon as possible with a solid number. Thank you for the inquiry and look forward to the possibility of working with you.

Sincerely & God Bless

Steve Lair

Steve Lair **Vice President**
972-812-7370 (w) Ext. # 146 | 214-912-7469 Cell
2040 Century Center Blvd. Ste. #10 | Irving, TX 75062
www.psg-dallas.com | slair@psg-dallas.com

From: Lisa Kiehl <lkiehl@algcorp.com>
Sent: Thursday, March 14, 2024 5:48 PM
To: Dan Belliveau <db@nohbell.com>; Mark Boswell <mboswell@psg-dallas.com>; Steve Lair <slair@psg-dallas.com>; Ad Verkuylen <ad@cdpmsc.com>
Subject: RE: Requesting Information - Cost Quote on Water Scrubber

Thank you for your response Dan.

Would your PSG team be able to provide me with an initial cost estimate for the NMV-1836 unit today or tomorrow?

ASHWORTH LEININGER GROUP
Los Angeles • San Francisco • Houston

Lisa Kiehl | Senior Environmental Engineer | QISP
T: 805.705.7601
lkiehl@algcorp.com | www.algcorp.com

From: Dan Belliveau <db@nohbell.com>
Sent: Wednesday, March 13, 2024 9:53 AM
To: Lisa Kiehl <lkiehl@algcorp.com>
Cc: Mark Boswell <mboswell@psg-dallas.com>; Steve Lair <slair@psg-dallas.com>; Ad Verkuylen <ad@cdpmsc.com>
Subject: Re: Requesting Information - Cost Quote on Water Scrubber

Hello Ms. Kiehl,

Thank you for your inquiry on the NoMoVo system for your clients application.

The NoMoVo system is designed to remove ETOH from emissions of various processes, wine fermentation being one. At this time the systems have only been installed to capture emissions from wine fermentation that have emission flow rates reaching 215 acfm.

Given the specification you noted, and assuming each tank is closed and has a vent port, I believe the smallest system (NMV-1836) would easily meet your requirements. Given the description, I assume the tanks would be filled / turned over in series so the NMV unit could be directly connected to the tank being filled / turned over. However, if all tanks were filled / turned over simultaneously, the same unit could be used though you would need to interconnect the exhaust ports to a common manifold.

Assuming the tanks are filled or turned over in series;

- A single NMV-1836 system should work.
- The unit is standalone, so minimal installation is required. The system does require an electrical connection.

I will let the PSG team answer the estimated cost of the unit and utility requirements as they are the manufacturer and integrator for these systems.

NoMoVo Cost Effectiveness Per EPA Cost Control Manual for Gas Absorbers

CAPITAL COSTS

Purchased Equipment Costs	Cost ($)[1,2]	Input Information / Notes
NoMoVo Unit(s)	$246,400	Vendor quote 4 NoMoVo Scrubbers @ $61,600 each
Instrumentation	$0	Included in cost of NoMoVo unit
Slurry Storage Tank	$40,000	Vendor quote
Sales Taxes	$9,451	3.3% of purchased equipment cost
Freight	$0	Included in cost of NoMoVo unit
Total of Purchased Equipment Cost (PEC)	**$295,851**	Total of previous Purchased Equipment Costs inputs

Direct Installation Costs	Cost ($)[1,2,4]	Input Information / Notes
Foundations and Support	$0	not applicable
Handling and Erection	$77,800	Vendor quote $19,450 install cost per scrubber
Electrical	$2,959	0.01 PEC
Piping	$56,650	Site specific data per vendor quote
Insulation	$0	Included in cost of NoMoVo unit
Painting	$0	Not applicable
Total of Direct Costs	**$137,409**	Total of previous Direct Installation Costs inputs

Other Direct Costs	Cost ($)[1,2]	Input Information / Notes
Site Preparation	$0	Not applicable
Buildings	$0	Not applicable
Total of Other Direct Costs	**$0**	Total of previous Other Direct Costs inputs

Indirect Costs (IC)	Cost ($)[1,2]	Input Information / Notes
Engineering	$45,458	Vendor quote 15% profit on NoMoVo units and piping
Construction and Field Expenses	$0	Included in handling and erection
Contractor Fees	$11,670	Vendor quote 15% profit on handling and erection
Start-Up	$0	Included in handling and erection
Performance Test	$0	Not applicable
Contingencies	$8,876	0.03 PEC
Total Indirect Costs	**$66,003**	Total of previous Total Indirect Costs inputs

TOTAL CAPITAL INVESTMENT (TCI)	**$499,263**	Total of Purchased Equipment Costs, Direct Installation Costs, Other Direct Installation Costs, and Indirect Costs

ANNUAL COSTS

Direct Annual Costs	Cost ($)[1,2]	Input Information / Notes
Operating Labor	$3,564	Vendor quote site specific data (.33 hrs/day/unit * 90 days * 4 units * $30/hr)
Operating Labor Supervisor	$535	0.15 of Operator Labor based on EPA Cost Control Manual
Operating Materials: Solvents	$0	Not applicable
Operating Materials: Chemicals	$230	Makeup slurry (water) 80 gallons/day/unit * 90 days * 4 units * $0.008/gallon
Wastewater Disposal	$2,304	80 gallons/day/unit * 90 days * 4 units * $0.08/gallon
Maintenance Labor	$2,280	Vendor quote (1 hr/wk/unit * 13 wk/season * 4 units * $30/hr + 6 hr/season/unit * 4 units * $30/hr)
Maintenance Material	$6,000	Vendor quote ($1,500 parts/rebuild kit * 4 units)
Chiller (Glycol System)	$1,722	Vendor quote (4000 Btu/hr/unit * 4 units * 24 hr/day * 90 days / 3412 Btu/hr/kW * $0.17/kWhr)
Electricity	$2,739	Vendor quote (2.5hp * .746kW/hp * 24 hr/day * 90 day/yr * 4 units * $0.17/kWhr)
Total Direct Annual Costs	**$19,374**	Total of previous Direct Annual Costs inputs

Indirect Annual Costs	Cost ($)[1,2]	Input Information / Notes
Overhead	$8,948	0.60 Labor and Maintenance Costs per EPA Control Cost Manual, Section 3, Chapter 2, Table 2.4
Administrative Charge	$9,985	0.02 TCI based on Table 2.4 from EPA Cost Control Manual
Property Taxes	$484	Site specific data (As assessed in 2017).
Insurance	$749	Winery PP&E insurance averages 15 basis points per $100 asset value
Annual Source Test(s)	$0	Not applicable
Total Indirect Annual Costs	**$20,166**	Total of previous Indirect Annual Costs inputs

Capitol Recovery	Inputs[1,2]	Input Information / Notes
Equipment Life (years)	15	Per EPA Cost Control Manual Section 5.2 Chapter 1 for Wet Scrubbers
Benchmark Interest Rate (%)	2.750	Department of the Treasury daily treasury yield curve rates for the specified equipment life[6]
Incremental Risk (%)	2.000	SBCAPCD P&P 6100.064, Section 7.1[7]
Interest Rate- Rounded Up (%)	5.000	Calculated value per SBCAPCD P&P 6100.064, Section 7.1
Capital Recovery Factor	0.09634	Calculated value, see EPA Cost Control Manual for Annualized Cash Flow equation
Annualized Capital Recovery	**$48,100**	**TCI * Capitol Recovery Factor**

COST EFFECTIVENESS

Capitol Recovery	Inputs[1,2]	Input Information / Notes
Total Annual Cost	$87,640	Calculated Value: Total Direct Annual Costs + Total Indirect Annual Costs + Annualized Capitol Recovery
Annual Tons Controlled	7.50	Annual Tons of ROC Controlled, see SBCAPCD Winery Calculation Spreadsheet[8]
Cost Effectiveness ($/ton)	**$11,691**	**Calculated Value: Total Annual Cost / Tons Controlled**

Notes:

1. Red values denotes user inputs.
2. Use site specific data where able.
3. Percentages found in the "Purchased Equipment Costs", "Direct Installation Costs", "Other District Costs", and "Indirect Costs" are from Table 2.3 in the EPA Cost Control Manual (Link: https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution#costmanual).
4. If able, do not include "Direct Installation Costs" as part of the "NoMoVo Unit(s)" PEC cost.
5. Percentages found in the "Direct Annual Costs" and "Indirect Annual Costs" are from Table 2.4 in the EPA Cost Control Manual (Link: https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution#costmanual).
6. Daily Yield Curve Rates from the U.S. Department of the Treasury can be found online at: https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.a
7. SBCAPCD Best Available Policy and Procedure 6100.064 can be found online at: https://www.ourair.org/wp-content/uploads/6100-071-1.pdf.
8. SBCAPCD Winery Calculation Spreadsheet can be found online at: https://www.ourair.org/wineries/.

Lisa Kiehl

From: Ken Kikta <k.kikta@carbtrol.com>
Sent: Friday, March 15, 2024 5:55 AM
To: Lisa Kiehl
Subject: Re: Tank Venting
Attachments: EtOH Carbon Est.pdf; TANK VENT'G ARRNG.pdf; Flame Arrester.pdf; G-1S ARRNG.pdf; G-1,2,3.pdf; GS Canister Spec.pdf; G-1 CURVE.pdf; Why the G-1 is the Best.pdf; G-1,2,3 Instructions.pdf; Air CSV.pdf

Hello Lisa

THank You

Please refer to the carbon usage estimate based on a concentration of 175 ppmv (by VOLUME) and 19 cfm and the data sheets..

The bed life can be extrapolated by using the daily carbon usage (based on 24 hr continuous operation) and the frequency and duration of filling events.

The G-1S Canister ($ 1175.00) is recommended and based on operating conditions. Since the vapors are flammable in nature a flame arrestor (by others) is recommended

We trust this will be helpful

Best

Ken

On Thu, Mar 14, 2024 at 4:16 PM Lisa Kiehl <lkiehl@algcorp.com> wrote:

> At peak temperatures, the estimated vapor density is ~0.011 lb/scf – roughly translating to ~ 175 ppm.