

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**  
**ENGINEERING AND COMPLIANCE**  
**APPLICATION PROCESSING AND CALCULATION**

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**PERMIT TO OPERATE EVALUATION**

Applicant name: Mizkan Americas, Inc. (FACILITY ID# 39855)

Mailing address: 10037 E. 8<sup>th</sup> St.  
Rancho Cucamonga, Ca 91730

Equipment Location: same

**EQUIPMENT DESCRIPTION:**

**APPLICATION NO. 419129**

**Equipment Description**

WASTEWATER EQUALIZATION TANK, EQ, 21'-6 1/2" DIA. X 11' -11 1/8" H., 31,074 GALLON CAPACITY

**Conditions:**

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.  
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.  
[RULE 204]
3. THE MAXIMUM AMOUNT OF MATERIAL TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 30 THOUSAND GALLONS IN ANY ONE DAY.  
[RULE 1303 (b) (2)- OFFSETS]
4. MATERIALS PROCESSED IN THIS EQUIPMENT SHALL NOT CONTAIN ANY COMPOUNDS IDENTIFIED AS CARCINOGENIC AIR CONTAMINANTS IN RULE 1401, TABLE 1 AS AMENDED JUNE 5, 2009, EXCEPT AS IDENTIFIED BELOW UP TO THE MAXIMUM FOLLOWING LIMITS:
  - I. ACETALDEHYDE LESS THAN OR EQUAL TO 0.00011% CONTENT BY VOLUME.  
[RULE 1401]

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5. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITION NO 3 AND NO. 4. THE RECORDS SHALL BE KEPT ON FILE FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.  
[RULE 3004 (a) (4)]

**BACKGROUND:**

Mizkan Americas, Inc. produces a variety of vinegars (5 – 15% acetic acid), including white distilled, red wine, white wine, rice, and other specialty flavored vinegars, for use in industrial and retail food sales. The wastewater equalization (EQ) tank is used to store the wastewater generated on site. The collected wastewater is subsequently hauled out for disposal.

In 2002, 38 public complaints were received. Thirteen of those complaints were received on June 21, 2002, resulting in NOV No. P36859, for public nuisance. In 2003, 65 public complaints were received. Fifteen of those complaints were received on 04/29/03, resulting in NOV No. P35165, for public nuisance. No NOV's for public nuisance have been issued since 2003.

The primary source of the nuisance odors has been the wastewater treatment system, which was installed in 1999 and which has caused foul anaerobic odors due to improper operation. These foul odors resulted in the issuance of NOV Nos. P36859 and P35165, as discussed above. After the Petition for an Order for Abatement was served in June 2003, the facility permanently closed down the wastewater treatment system immediately. On August 22, 2003, Mizkan Americas, Inc. filed application No. 419129 for a wastewater storage (EQ) tank. As stated above, the wastewater generated on site is collected and hauled out for disposal.

**PROCESS DESCRIPTION:**

There are 7 sumps used in the system which are listed and described below. Additionally there is a storm water collection sump in the driveway area that is not a part of this application as it receives only storm water runoff and does not discharge to the wastewater treatment system unless there is a catastrophic spill in the driveway. In the case of a major spill, a panic button can be activated to pump the spilled material to the wastewater system. The 7 sumps are as follows:

1. Niagara Sump; Serves the tank farm (including acetators and scrubbers)  
Round – 32" Diameter by 7'- 6" deep  
Open grate top

Automatic pump to wastewater system;

2. Rice Room Sump; Serves the Rice Room  
20" by 20" by 29" deep  
Open grate top; located indoors  
Automatic pump to wastewater system;
3. Romicon Sump; Serves lower bulk tank farm  
3' by 5' by 20" deep  
Open grate top; located indoors  
Automatic pump to wastewater system
4. Upper Bulk; Serves upper bulk tank farm  
18" by 20" by 54" deep  
Open grate top; located indoors  
Manual pump to wastewater system;
5. Production Sump; Serves bottling room, cube line, boiler room, lab, salad dressing room  
52" by 40" by 54" deep  
Closed top;  
Automatic pump to wastewater system;
6. Truck Loading Sump; Spill/drip sump  
6' by 6' by 7'-6" deep  
Open grate top  
Manual pump to wastewater system
7. Specialty Room Sump; Two sumps located side by side and piped together in series  
22" by 22" by 6.5' and 22" by 22" by 6'  
Open grate top  
Automatic pump to wastewater system

All sumps transfer wastewater to a 3 inch system main line to the EQ tank. The EQ tank water level is not pumped below the 4' mark on the level gauge at anytime except during the sludge removal procedure. A label is fixed next to the 4' mark on the level gauge board stating that the liquid level will not be pumped below this mark. The sludge level is measured once per week using an appropriate sludge measuring device. The level is documented and reported to the maintenance manager. When the sludge level reaches 22 inches the sludge removal procedure will be implemented.

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Sludge removal is scheduled every three months even if the level has not reached the test valve. If sludge has reached the test valve prior to the end of the 3 month period, then the sludge removal process is implemented.

The sludge removal procedure consists of using a semi-trailer vacuum type pumper unit with the suction hose immersed below the water level and submerged into the sludge. The process is continually monitored and if at anytime the water level approaches the sludge level the pumping is stopped and water added to the EQ tank to insure that the sludge never becomes exposed. This process has been completed several times with no noticeable odors.

**EMISSIONS**

Tanker Volume = 5,000 gallons

Max # of fills/day = 6

System Temperature = 23.9 degrees C

Concentration:

Sample 1 (In-House Test 2004)

Ethanol = 0.2 %

Acetic Acid = 0.3%

Water = 98.49719 %

Acetaldehyde = .00011%

Ethyl Acetate = .0027%

Sample 2 (In House Test 2004)

Ethanol = 0.4%

Acetic Acid = 0.3%

Water = 98.29719%

Acetaldehyde = .00011%

Ethyl Acetate = .0027%

Use Sample 2 Data (higher emissions)

|               | Molecular Weight (MW) | Specific Gravity | Percent  | Gallons   | Cu.Ft.   | kg       |
|---------------|-----------------------|------------------|----------|-----------|----------|----------|
| ETHANOL       | 46                    | 0.816            | 0.4      | 20        | 2.68     | 61.93244 |
| ACETIC ACID   | 60.05                 | 1.1              | 0.3      | 15        | 2.01     | 62.61552 |
| WATER         | 18.015                | 1                | 99.29719 | 4964.8595 | 663.76   | 18797.68 |
| ACETALEDHYDE  | 44                    | 0.783            | 0.00011  | 0.0055    | 0.000737 | 0.018677 |
| ETHYL ACETATE | 88                    | 0.8945           | 0.0027   | 0.135     | 0.018097 | 0.458425 |

|               | kg-moles     | mol fraction | Vap P    | Partial P |
|---------------|--------------|--------------|----------|-----------|
| ETHANOL       | 1.3463574    | 0.0012873    | 55.9909  | 0.0359    |
| ACETIC ACID   | 1.0427231    | 0.0009970    | 14.5867  | 0.0145    |
| WATER         | 1043.4461948 | 0.9977102    | 22.1606  | 22.1244   |
| ACETALEDHYDE  | 0.0004245    | 0.0000004    | 860.2495 | 0.0003    |
| ETHYL ACETATE | 0.0052094    | 0.0000050    | 91.0905  | 0.0005    |

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IDEAL GAS LAW

$$n = PV/RT$$

$$n = (\text{Partial Pressure mm Hg}) (\text{Volume Displacement cu. ft.}) / (\text{Gas Constant KJ/KM-J}) (\text{Temperature K})$$

| Gas Constant | Temperature (K) |
|--------------|-----------------|
| 998.99       | 296.9           |

|               | Partial Pressure mmHg | Cu. ft. (Displacement) | lb-moles   | lbs/day 1 truck | lbs/day 6 trucks |
|---------------|-----------------------|------------------------|------------|-----------------|------------------|
| ETHANOL       | 0.0359000             | 668.43                 | 8.0906E-05 | 0.003721662     | 0.022329969      |
| ACETIC ACID   | 0.0145000             | 668.43                 | 3.2678E-05 | 0.001962301     | 0.011773806      |
| WATER         | 22.1244000            | 668.43                 | 0.04986044 | 0.898235806     | 5.389414834      |
| ACETALEDHYDE  | 0.0003000             | 668.43                 | 6.7609E-07 | 2.97481E-05     | 0.000178488      |
| ETHYL ACETATE | 0.0005000             | 668.43                 | 1.1268E-06 | 9.91602E-05     | 0.000594961      |

TOTAL EMISSIONS (Ethanol + Acetic Acid + Acetaledhyde + Ethyl Acetate)

| Total Emissions (lbs/day) |
|---------------------------|
| 0.034877224               |

**VOC**

**MAX HOURLY**

$$.035 \text{ lbs/day (1 day/ 3 hours)} = \mathbf{.105 \text{ lbs/hr}}$$

**MAX DAILY**

$$.105 \text{ lbs/hr} * 3 \text{ hrs max} = \mathbf{.035 \text{ lbs/day}}$$

**30 DAY AVERAGE**

$$.035 \text{ lbs/day (30 days)} / (30 \text{ days}) = \mathbf{.035 \text{ lbs/day}}$$

**ANNUAL EMISSIONS**

$$.035 \text{ lbs/day (365 days)} = \mathbf{12.775 \text{ lbs/year}}$$

**RULES EVALUATION:**

**Rule 212- Standard for Approving Permits**

Paragraph 212(c)(1) Requires a public notice for all new or modified permit units that may emit air contaminants located within 1,000 feet from the outer boundary of a school. According to the website mapquest.com the nearest school, Rancho Cucamonga Middle School, is 1214 ft. from the Waste Water EQ Tank. A 30-Day Public Notice is not required under this paragraph.

Paragraph 212(c)(2) The equipment will not result in on-site emission increases exceeding the daily maximum emissions as specified in the table in Rule 212(g). Therefore, a 30-day public notice period will not be required under this paragraph.

Paragraph 212(c)(3) Public notice will not be required under this paragraph. See Rule 1401 evaluation section.

**Rule 401- Visible Emission:** No visible emission is expected if the equipment is well maintained and properly operated. Therefore, compliance is expected.

**Rule 402- Nuisance:** In June 2003, the wastewater treatment system was shut down and replaced with the wastewater handling and storage system. The odor complaints have been reduced in the past three years because the sludge is pumped out diluted with water, and not just as a sludge as in previous years. The wastewater is trucked out 5 days per week. Compliance with this rule is expected.

**Rule 1131 – Food Product Manufacturing and Processing Operations**

The rule is applicable to any person using solvents in any food product manufacturing and processing operation including but not limited to distillation, extraction, reacting, blending, drying, crystallizing, granulating, separation, sterilization, and filtering. Solvents are not used in the waste water collection process, therefore this rule does not apply.

**Rule 1173 - Control of VOC Leaks and Releases from Components at Petroleum Facilities and Chemical Plants**

This rule is intended to control VOC leaks from components and releases from atmospheric process pressure relief devices. This rule applies to components at refineries, chemical plants, lubricating oil and grease re-refiners, marine terminals, oil and gas production fields, natural gas processing plants and pipeline transfer stations.

Vinegar manufacturing is not applicable because the definition for chemical plants only include those that begin with Standard Industrial Classification Code 282.

**Rule 1176 - VOC Emissions from Waste Water Systems**

This rule is intended to limit volatile organic compound (VOC) emissions from wastewater systems. This rule applies to wastewater systems and associated control equipment located at petroleum refineries, on-shore oil production fields, off-shore oil production platforms, chemical plants, and industrial facilities. Vinegar manufacturing is not applicable because the definition for chemical plants and industrial facilities only include those with Standard Industrial Classification group numbers 282, 492, or 461.

**REGULATION XIII – New Source Review:**

**Rule 1303(a)-BACT:** The BACT requirements for this equipment are:

Process: Waste Water System

|                              | Criteria Pollutants                                              |     |               |     |    |      |
|------------------------------|------------------------------------------------------------------|-----|---------------|-----|----|------|
| Subcategory/<br>Rating/ Size | VOC                                                              | NOX | NOX +<br>NMHC | SOX | CO | PM10 |
| Other Equipment              | Compliance with AQMD Rule 1176 if Applicable by Rule (12-5-2003) |     |               |     |    |      |

BACT is compliance with Rule 1176, however, vinegar manufacturing is not applicable. Even if operated 24/7, the daily maximum VOC emissions would be .035 lbs/day. After 3 hours of operation, the facility would not be able to dispose of any more wastewater therefore the emissions would not reach 1 lb/day, therefore BACT does not apply. Wastewater tank is open.

**Rule 1303 -Modeling:** Modeling is not required for VOC as specified in Rule 1303.

**Rule 1303 -Offsets:** Offsets are not required because the project’s potential to emit of VOC is less than 0.5 lbs/day.

**Rule 1401 – New Source Review of Toxic Air Contaminants**

Acetaldehyde is a carcinogen and chronic compound. Based on the information

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provided by the applicant, the waste water tank contain trace amounts of acetaldehyde as identified in Rule 1401, as amended on March 7, 2008. Source Test Data from December 1, 2006 shows speciation samples were taken and that the concentration of Acetaldehyde to the inlet of the Scrubber was 55 ppmv. Based on this data, the facility indicated that the maximum concentration inside the EQ tank is 110 ppmv.

The Maximum Individual Cancer Risk (MICR) for acetaldehyde emissions is less than 1 in 10 million at a distance of 5 meters (SEE TIER 1 SCREENING REPORT). Emissions are based using .0002 lbs/hr instead of .0002 lbs/day as the actual emissions. In addition, the screening is done over 24 hours, 7 days, 52 weeks per year.

As stated by the facility, the Production Sump is approximately 990 feet of the school. The sumps are not part of the "permit unit", therefore does not require public notice. Further, the sump is closed, and therefore not an emission point.

**Reg XXX – Title V Permits:** Applications for De minimis Significant Permit Revisions require EPA 45-day review.

**CONCLUSIONS AND RECOMMENDATIONS:**

Based on the evaluation contained herein, the subject equipment is expected to comply with all of the District's rules and regulations; therefore, I recommend a Permit to Operate be issued to the Waste Water EQ Tank (A/N 419129).

**TIER 1 SCREENING RISK ASSESSMENT REPORT**

|                                    |    |
|------------------------------------|----|
| Receptor Distance (actual)         | 5  |
| Receptor Distance (for X/Q LOOKUP) | 25 |

| Tier 1 Results                           |                         |
|------------------------------------------|-------------------------|
| Cancer/Chronic ASI<br>1.53E-01<br>PASSED | Acute ASI<br><br>PASSED |

**APPLICATION SCREENING INDEX CALCULATION**

| Compound                                   | Average Annual Emission Rate (lbs/yr) | Max Hourly Emission Rate (lbs/hr) | Cancer / Chronic Pollutant Screening Level (lbs/yr) | Acute Pollutant Screening Level (lbs/hr) | Cancer / Chronic Pollutant Screening Index (PSI) | Acute Pollutant Screening Index (PSI) |
|--------------------------------------------|---------------------------------------|-----------------------------------|-----------------------------------------------------|------------------------------------------|--------------------------------------------------|---------------------------------------|
| Acetaldehyde                               | 1.75E+00                              | 2.00E-04                          | 1.14E+01                                            |                                          | 1.53E-01                                         |                                       |
| <b>TOTAL (APPLICATION SCREENING INDEX)</b> |                                       |                                   |                                                     |                                          | <b>1.53E-01</b>                                  |                                       |

