DRAFT ENGINEERING EVALUATION
Zymergen
Plant: 24175
Application: 29650

BACKGROUND

Zymergen has applied to obtain an Authority to Construct and Permit to Operate for the following sources:

S-1 Wipe Cleaning Operation (6121 Hollis Street)
1,200 gallon maximum solvent usage

S-2 Wipe Cleaning Operation (5980 Horton Street)
1,800 gallon maximum solvent usage

The facility is located at 5980 Horton Street, Emeryville, CA 94608 and operates multiple buildings with in the area. The application is for two wipe cleaning operations. S-1 at 6121 Hollis Street is for 1,200 gallons of solvent usage per year. S-2 at 5980 Horton Street is for 1,800 gallons of solvent usage per year. Each location will be using two different types of solvents for their wipe cleaning operations. The Texwipe Wipers are pre-wetted towels. The Ster-ahol is a solvent cleaner stored in pre-mixed bottles. The Ster-ahol is dispensed from the bottle in a stream for wipe cleaning operations.

Zymergen has been using these sources since January 1, 2018.

EMISSION CALCULATIONS

Criteria Pollutants

Zymergen will be using up to 1,200 gallons per year of S-1 and up to 1,800 gallons of solvent per year at S-2. To allow the facility the flexibility to use either solvent cleaners, both the precursor organic compounds (POC) and the non-precursor organic compounds (NPOC) will be permitted based on the solvent cleaner with the highest concentration of volatile organic compounds (VOC), which is the Texwipe Wipers. The average daily emissions will be based on the annual usage during 365 days per year.

S-1 (6121 Hollis Street): VOC Emissions

$$Maximum\ Annual\ VOC\ Emissions = (1{,}200\ gal/year) \times\ (6.58\ lb/gal) = 7{,}896\ lb/yr\ = 3.948\ tpy$$
$$Average\ Daily\ VOC\ Emissions = (7{,}896\ lb/year) \div\ (365\ days/yr) = 21.6\ lb/day$$

S-2 (5980 Horton Street): VOC Emissions

$$Maximum\ Annual\ VOC\ Emissions = (1{,}800\ gal/year) \times\ (6.58\ lb/gal) = 11{,}844\ lb/yr\ = 5.922\ tpy$$
$$Average\ Daily\ VOC\ Emissions = (11{,}844\ lb/year) \div\ (365\ days/yr) = 32.4\ lb/day$$

The average daily emissions for POC will exceed 10 lb/day; therefore, the sources will be subject to Regulation 2-2-301.

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The applicant will be permitted the following emission limits for S-1 and S-2:

Pollutant	Emissions		
	Annual (lb/yr)	Annual (TPY)	Average Daily (lb/day)
POC			
S-1	7,896	3.948	21.6
S-2	11,844	5.922	32.4
Total POC Emissions	**19,740**	**9.870**	**54.0**
NPOC			
S-1	7,896	3.948	21.6
S-2	11,844	5.922	32.4
Total NPOC Emissions	**19,740**	**9.870**	**54.0**

Toxic Pollutants

The annual emission calculations for each toxic air contaminant will assume the maximum annual usage of each contaminant for each source. Percentages for each toxic air contaminant are presented in the safety data sheets for each cleaning sovlent. Although the facility operates up to 16 hours a day, the maximum hourly usage will assume that the daily average usage will occur in 1 hour.

S-1 (6121 Hollis Street): Isopropyl Alcohol Emissions

$$Maximum\ Annual\ Emissions = \left(1{,}200\,\frac{gal}{year}\right) \times \left(6.56\,\frac{lb}{gal}\right) \times (5\%) = 394\ lb/yr$$

$$Maximum\ Hourly\ Emissions = \left(394\,\frac{lb}{year}\right) \times \left(\frac{yr}{365\ days}\right) \times \left(\frac{1\ day}{1\ hour}\right) = 1.08\ lb/hour$$

S-1 (6121 Hollis Street): Methanol Emissions

$$Maximum\ Annual\ Emissions = \left(1{,}200\,\frac{gal}{year}\right) \times \left(6.61\,\frac{lb}{gal}\right) \times (3.5\%) = 278\ lb/yr$$

$$Maximum\ Hourly\ Emissions = \left(278\,\frac{lb}{year}\right) \times \left(\frac{yr}{365\ days}\right) \times \left(\frac{1\ day}{1\ hour}\right) = 0.76\ lb/hour$$

S-2 (5980 Horton Street): Isopropyl Alcohol Emissions

$$Maximum\ Annual\ Emissions = \left(1{,}800\,\frac{gal}{year}\right) \times \left(6.56\,\frac{lb}{gal}\right) \times (5\%) = 590\ lb/yr$$

$$Maximum\ Hourly\ Emissions = \left(590\,\frac{lb}{year}\right) \times \left(\frac{yr}{365\ days}\right) \times \left(\frac{1\ day}{1\ hour}\right) = 1.62\ lb/hour$$

S-2 (5980 Horton Street): Methanol Emissions

$$Maximum\ Annual\ Emissions = \left(1{,}800\,\frac{gal}{year}\right) \times \left(6.61\,\frac{lb}{gal}\right) \times (3.5\%) = 416\ lb/yr$$

$$Maximum\ Hourly\ Emissions = \left(416\,\frac{lb}{year}\right) \times \left(\frac{yr}{365\ days}\right) \times \left(\frac{1\ day}{1\ hour}\right) = 1.14\ lb/hour$$

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The following is a summary of the toxic air contaminants:

Toxic Air Contaminant	Emissions		Chronic Toxic Trigger (lb/yr)	Acute Toxic Trigger (lb/hr)	HRA Triggered?
	Annual (lb/yr)	Hourly (lb/hour)			
S-1:					
Isopropyl Alcohol	394	1.08	27,000	7.1	NO
Methanol	278	0.76	15,000	6.2	NO
S-2					
Isopropyl Alcohol	590	1.62	27,000	7.1	NO
Methanol	416	1.14	15,000	6.2	NO
Total					
Isopropyl Alcohol	984	2.70	27,000	7.1	NO
Methanol	694	1.90	15,000	6.2	NO

Emissions of toxic air contaminants will not exceed the acute or chronic trigger levels in Regualtion 2-5.

Cumulative Increase

The table below summarized the cumulative increase in criteria pollutants that will result from the operation of S-1 and S-2:

Plant Cumulative Emissions Increase, Post 4/5/91

Pollutant	Permitted Emissions, Post 4/5/91 (TPY)		Project Cumulative Emissions Increase (TPY)		Plant Cumulative Emissions Increase (TPY)
NO_x	0.031	+	0.000	=	0.031
POC	0.002	+	9.870	=	9.872
CO	0.013	+	0.000	=	0.013
PM_{10}	0.002	+	0.000	=	0.002
$PM_{2.5}$	0.000	+	0.000	=	0.000
SO_2	0.000	+	0.000	=	0.000
NPOC	0.000	+	9.870	=	9.870

STATEMENT OF COMPLIANCE:

Regulation 2 - Permits, Rule 1 – General Requirements

Ministerial Projects (Section 2-1-311)

An application that is classified as ministerial is exempt from the CEQA requirement of *Section 2-1-310 Applicability of CEQA.* Section 6.3 of the District's Permit Handbook, which sets forth evaluation guidelines for Wipe Cleaning Operations, was used to evaluate these sources. As such, this application is classified as ministerial and these sources are exempt from CEQA review with respect to air quality.

Public Notice, Schools (Section 2-1-412)

A new or modified source located within 1,000 feet of the outer boundary of a K-12 school site which results in an increase of emissions from toxic air contaminants is subject to the public notice requirement. The outer boundary of the nearest K-12 school, LaPort Montesorri Emeryville, is less than 1,000 feet from the location of this project as shown in the attached Google Earth image. This project is subject to the public notification requirements of *Regulation 2-1-412*. Notification of the proposed new sources must be mailed to the parents or guardians of all children enrolled in any school within on-quarter mile of the sources, and to each address within a radius of 1,000 feet of the sources, in order to give these parties an opportunity to provide public comments on the proposed

actions. All comments received within 30 days of the publication of this notice will be reviewed and considered in the final evaluation and approval or denial of the application.

Regulation 2 - Permits, Rule 2 – New Source Review

Best Available Control Technology Requirement (Section 2-2-301)

Any new source is required to use Best Available Control Technology (BACT) to control emissions of any District BACT pollutants [precursor organic compounds (POC), non-precursor organic compounds (NPOC), oxides of nitrogen (NO_x), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter equal to or less than either 10 microns (PM_{10}) or 2.5 microns ($PM_{2.5}$), and/or carbon monoxide (CO)] that have the potential to emit 10 or more pounds on any day. BACT for this source is set forth in the *BAAQMD BACT/TBACT Workbook for Wipe Cleaning Operation, Document # 179B.1, Revision 2 dated 2/4/1993*. BACT 1 for POC and NPOC is the use of hood, booth, and room vented to a control device with emissions controlled to an overall capture efficiency of 90% by weight. Using the EPA *OAQPS Control Cost Manual*, the estimated annualized cost for a carbon absorber is $204,894. Since the sources are located in two different buildings, the cost estimate will focus on the emissions from the source with the highest POC emission, which is S-2. With a capture efficiency of 90%, the cost per ton to reduce the POC emissions by 5.3 tons is $50,942. The cost for abatement exceeds $17,500/ton and therefore is not considered cost-effective to implement. The BACT 2 requirements specifies the use of lowest practical vapor pressure solvents and the use of controlled flow solvents dispensers. The Texwipes are pre-saturated wipes that are stored in sealed containers. The Ster-ahol is stored in bottles that dispenses the solution in a stream for wipe cleaning. Both solutions will meet the requirements for BACT 2 and are in compliance with this regulation.

Offset Requirements, POC and NO_x (Section 2-2-302)

The facility is required to provide offsets if the facility has the potential to emit more than 10 tons per year of NO_x or POC. The potential to emit for POC and NO_x at this facility are 9.872 and 0.031 tons per years, respectively. Since POC and NO_x emissions from the facility are less than 10 tons per year, offsets are not required.

Regulation 2- Permits, Rule 5 New Source Review of Toxic Air Contaminants

General (2-5-100)

All TAC emissions from the planned operation of these wipe cleaning sources are summarized in the toxic pollutant calculations above. The emissions from the wipe cleaning operations will not exceed the acute or chronic trigger levels in Table 2-5-1 of Regulation 2-5. These sources are not subject to Regulation 2-5.

Regulation 8 – Organic Compounds, Rule 1 General Provisions

Surface Preparation; Clean-up; Coating Ink, Paint Removal (8-1-320)

Regulation 8-1-320 states that items that are impregnated with an organic compound will not be disposed of or stored in an open container. The facility is expected to meet this requirement.

Closed Containers (8-1-321)

Regulation 8-1-321 states that organic solvents will not be stored in open containers. The facility is expected to meet this requirement.

Regulation 8 – Organic Compounds, Rule 4 General Solvents and Surface Coating Operations

Limited Exemption, Specific Surface Preparations and Cleaning Operations (8-4-116)

The facility works on research and development operations. The wipe cleaning operations are associated with research and development operations and meet this exemption.

Surface Preparation Standards (8-4-313)

This project is exempt from this regulation per Regulation 8-4-116.

Regulation 8 – Organic Compounds, Rule 16 Solvent Cleaning Operations

Exemption: Wipe Cleaning (8-16-111)

Wipe cleaning operations are not subject to Regulation 8-16-301 through Regulation 8-16-304, but are subject to Section 8-16-501.3.

Solvent Records (8-16-501)

S-1 and S-2 are subject to the record keeping requirements of Regulation 8-16-501.3. Permit Conditions for S-1 and S-2 will include reporting requirements to meet this standard.

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Federal Requirements

New Source Performance Standards (NSPS)

S-1 and S-2 are not subject to any subpart of 40 CFR Part 60.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

S-1 and S-2 are not subject to any subpart of 40 CFR Part 63.

CONDITIONS

I recommend the following conditions for S-1 and S-2:

COND# 26990 ----------

Application #29650
S-1 Wipe Cleaning Operation
S-2 Wipe Cleaning Operation

1. The owner/operator of S-1 shall not exceed a total combined limit of 1,200 gallons during any consecutive twelve-month period of the following solvents:
   Texwipe Wipers
   Ster-ahol
   (Basis: Cumulative Increase)

2. The owner/operator of S-2 shall not exceed a total combined limit of 1,800 gallons during any consecutive twelve-month period of the following solvents:
   Texwipe Wipers
   Ster-ahol
   (Basis: Cumulative Increase)

3. The owner/operator of S-1 and S-2 shall use a controlled flow solvent dispenser for solvents stored in containers.
   (Basis: BACT)

4. The owner/operator of S-1 and S-2 may use alternate solvent(s) other than the materials specified in Part 1 or Part 2 and/or usages in excess of those specified in Part 1 or Part 2, provided that the owner/operator can demonstrate that all of the following are satisfied:
   a. Total emissions of POC and NOPC combined from S-1 do not exceed 7,896 pounds in any consecutive twelve-month period;
   b. Total emissions of POC and NPOC combined from S-2 do not exceed 11,844 pounds in any consecutive twelve-month period;
   c. The use of these materials does not increase toxic emissions above any risk screening trigger level of Table 2-5-1 in Regulation 2-5.
   (Basis: Cumulative Increase; Toxics)

5. To determine compliance with the above parts, the owner/operator of S-1 and S-2 shall maintain the following records and provide all of the data necessary to evaluate compliance with the above parts, including the following information:
   a. Quantities of each type of solvent used at each source on a monthly basis.
   b. If a material other than those specified in Part 1 and Part 2 are used, POC, NPOC, and toxic component contents of each material used; and mass emission calculations to demonstrate compliance with Part 4, on a monthly basis;
   c. Monthly usage and/or emission calculations shall be totaled for S-1 and S-2 for each consecutive twelve-month period.

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All records shall be retained on-site for two years, from the date of entry, and made available for inspection by District staff upon request. These recordkeeping requirements shall not replace the recordkeeping requirements contained in any applicable District Regulations.
(Basis: Cumulative Increase; Toxics)

RECOMMENDATIONS:

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct/Permit to Operate for the equipment listed below. However, the proposed source will be located within 1,000 feet of a school, which triggers the public notification requirements of District Regulation 2-1-412. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of an Authority to Construct/Permit to Operate for the following source:

S-1 Wipe Cleaning Operation (6121 Hollis Street)
1,200 gallon maximum solvent usage

S-2 Wipe Cleaning Operation (5980 Horton Street)
1,800 gallon maximum solvent usage

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Loi Chau, Air Quality Engineer **Date**

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