

ENGINEERING EVALUATION
Advanced IPM
1599 Maritime Street, Oakland, CA
Plant: 24752
Application: 30604

BACKGROUND

Advanced IPM has applied to obtain a Permit to Operate for the following equipment:

S-2 Commodity Fumigation – Eco2fume (2.2% Phosphine)

Advanced IPM (applicant) is a residential and commercial pest control company. The facility has operated a Commodity Fumigation chamber (S-2) at Ports America – 1599 Maritime Street (original P#24736) in Oakland, CA since March 2019 without a permit. Advanced IPM has another plant (P#24752) located at 1050 Ferry St in Oakland, CA. Both locations are located at the Port of Oakland. Pursuant to the facility definition in Reg 2-1-213: Any aggregation of sources, buildings, structures or installations that emit any air pollutant which are (i) located on one or more contiguous or adjacent properties; (ii) are under common ownership; and (iii) are considered to be in the same major industrial group (same first two digits of the applicable code in The Standard Industrial Classification Manual) S-1 and S-2 are located on one property (Port of Oakland) and the distance from S-1 to S-2 is about 0.7 miles. The sources are under common ownership and the SIC code for both locations is the same, 7342. Therefore, both locations are considered to be one facility.

The fumigation chamber is comprised of a maximum 8.5' x 8' x 20' cargo container. Each container has a volume of 1,360 ft³. The containers store dried fruit, nuts, and grains to be exported out of the country. They fumigate multiple cargo containers at four separate locations at Ports of America. The areas of operation proposed by the applicant are designated as W&V, J, D &C, and Outer Harbor 1 sections. The locations can be seen in the attached Google Earth site map. The facility operates the entire year at a fumigation rate of 1 to 20 cargo containers per day. This amount depends on ambient temperature at the Ports of America and varies seasonally. Eco2fume is the only fumigant used in the process. It is a mixed gas fumigant comprising of 97.8% CO₂ and 2.2% phosphine. Eco2fume is introduced into the chamber until the fumigant reaches a maximum concentration of 0.002 lb/ft³. The chamber maintains this concentration between 48 and 72 hours. The chamber is then opened to the atmosphere and is passively vented.

EMISSIONS SUMMARY

Criteria Pollutants

Emissions Calculations:

Emissions are based on the maximum Eco2fume concentration of 0.002 lb/ft³ per container. According to the attached Safety Data Sheet (SDS), the mixed gas is comprised of a maximum of 2.2% of phosphine. Thus, the maximum phosphine concentration used in the calculations below is 0.000044 lb/ft³. Based on this concentration, the facility is limited to 1.4 containers per day or 510 containers per year. Since phosphine does not have an acute trigger level per Reg 2-5-1, a daily limit is not placed in the permit conditions. However, an annual limit of 510 containers per year will be enforced in the permit conditions below. Hourly emission is based on a worst-case scenario of one container per hour to be vented.

$$\begin{aligned}\text{Maximum Phosphine Concentration} &= .002 \text{ lb/ft}^3 \text{ (mixed gas concentration)} * 2.2 \% \text{ phosphine} \\ &= .000044 \text{ lb/ft}^3\end{aligned}$$

$$\begin{aligned}\text{Maximum Phosphine Daily Emissions} &= (8.5 \text{ ft} * 8 \text{ ft} * 20 \text{ ft})/\text{container} * (0.000044 \text{ lb/ft}^3\text{-day}) * 20 \\ \text{containers} & \\ &= 1.20 \text{ lb/day}\end{aligned}$$

$$\begin{aligned}\text{Maximum Phosphine hourly Emissions} &= (8.5 \text{ ft} * 8 \text{ ft} * 20 \text{ ft})/\text{container} * (0.000044 \text{ lb/ft}^3\text{-day}) * 1 \\ \text{container} & \\ &= 0.06 \text{ lb/hr}\end{aligned}$$

$$\begin{aligned}\text{Maximum Phosphine Annual Emissions} &= (8.5 \text{ ft} * 8 \text{ ft} * 20 \text{ ft})/\text{container} * (0.000044 \text{ lb/ft}^3\text{-day}) * 510 \\ \text{containers} & \\ &= 30.5 \text{ lb/year}\end{aligned}$$

STATEMENT OF COMPLIANCE

Regulation 2 - Permits, Rule 1 – General Requirements

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 the increase in emissions of a toxic air contaminant are subject to the public notice requirements of Regulation 2-1-412. The facility is not within 1,000 feet of a K-12 school. School public notice is not required.

However, this application is located in an Overburden Community as defined in Regulation 2-1-243, since the project (including related application A#31272) triggered a Health Risk Assessment (see detailed discussion in following Reg 2-5 compliance section), therefore, the application is subject to the public notification requirements of Regulation 2-1-412. A public notice will be prepared and sent to all addresses within 1,000 feet of the sources.

CEQA-Related Information Requirements (Section 2-1-426)

A project that is not exempt from CEQA is subject to requirements of Regulation 2-1-426. The Alameda County Agriculture Department is considered the lead agency for this project and fulfills the CEQA requirement by issuing a permit under the Restricted Materials and Permitting Program. The program was developed by the California Department of Pesticide Regulation and administered by county agricultural commissioners to serve as a functional equivalent to a full-scale Environmental Impact Report normally required by CEQA. The Restricted Materials and Permitting Program is a certified program substitute as listed under 14 CCR Section 15251(i). A copy of the permit from the Alameda County Agriculture Department is included in this application folder.

The Memorandum of Understanding (MOU) between the District and the County Agricultural Commissioners regarding Methyl Bromide Agricultural Commodity Fumigation Chamber Facilities, dated 1997, provides some guidance regarding the responsibilities of each party. In the MOU, the District “will not issue a separate permit, provided that the permit issued by the Agricultural Commissioner includes the District’s recommended permit conditions”. The permit issued by the Alameda County Agriculture Department will meet the requirements for CEQA. Since the Restricted Materials Permit did not include the District’s permit conditions, the District will issue a separate permit to ensure compliance with District, state, and federal regulations with respect to air quality. Additional review under CEQA is not required. Nevertheless, the applicant has submitted a completed CEQA Appendix H form and the

District’s permit issuance includes a condition that requires the owner/operator to maintain a valid Restricted Materials Permit at all times of operation.

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 [POC, non-precursor organic compounds (NPOC), oxides of nitrogen (NO_x), sulfur dioxide (SO₂), particulate matter with an aerodynamic diameter equal to or less than either 10 microns (PM10) or 2.5 microns (PM2.5), and/or carbon monoxide (CO)] that have the potential to emit 10 or more pounds on any day. Phosphine is not considered a criteria pollutant. The formula is PH₃. Therefore, this project is not subject to BACT.

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

This section establishes emission offset requirements for POC and NO_x at facilities that will have the potential to emit more than 10 tons per year of POC or NO_x. If the facility will have the potential to emit more than 10 tons per year but less than 35 tons per year of NO_x or POC after the new or modified source is constructed, offsets must be provided at a 1:1 ratio for any un-offset cumulative increase in emissions at the facility. These offsets shall be provided by the District’s Small Facility Banking Account unless the applicant owns offsets. Phosphine is not an organic compound. Offsets will not be required.

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

General (2-5-100)

Application	Pollutant	Emission Rates		Risk Screening Triggers		Risk Screening Required?
		lb/hr	lb/yr	Acute lb/hr	Chronic lb/yr	
30604	Phosphine	0.06	30.5	-	31	Yes
31272	Phosphine	1.32	125			

Phosphine is listed as a toxic air contaminant in Table 2-5-1 of Regulation 2, Rule 5. Phosphine emissions from the operations of S-2 are less than the chronic trigger limit per Table 2-5.1 of Regulation 2-5. However, on January 5, 2022, this facility was issued a Permit to Operate for fumigation using 125 lb/yr of phosphine at 1050 Ferry St. of the Port of Oakland under Application # 31272, which is the only related application within last 5 years. Pursuant to Reg 2-5-216, project total TAC emissions would be S-1’s 125 lb/year of phosphine (A#31272) plus S-2’s 30.5 lb/year of phosphine in this application for a total of 155.5 lb/year of phosphine emissions. This amount is greater than phosphine’s chronic trigger limit; therefore, an HRA is triggered. As seen in the attached updated HRA report memo (dated 9/15/2022) for this application by the Toxic Evaluation Section, results from the HRA indicate that the project chronic hazard index is estimated at 0.19. In accordance with the District’s Regulation 2-5-301, these sources do not require TBACT because each estimated source chronic hazard index is less than 0.20. Pursuant to Reg 2-1-409, A#30604 will be subject to a cancer risk limit of 10 in a million (even though the project is located in an Overburden Community) because it was deemed complete before the new OBC project risk limit (6 in a million) in 2-5-302.1 became effective on 7/1/2022. However, since the TAC emitted by this project, phosphine, is not a carcinogen and does not have an acute reference exposure level (REL), only the chronic non-cancer health impact (chronic hazard index) is reported for this project, project cancer risk limit is not applicable for this application. Since the estimated project chronic hazard index is less than 1.0, this project complies with the Regulation 2-5-302 project risk requirements.

Regulation 3: Fees

The facility has been operating the fumigation since March 1, 2019 without a permit. Therefore, the facility was required to pay a late fee pursuant to Reg 3-310.1, back fees for operating between 2019 to 2022 pursuant to Reg 3-303; and one year of Permit to Operate fees for the year 2022 to 2023. The facility has paid these fees under Invoice 4HQ49.

Regulation 8 – Organic Compounds, Rule 1 – General Provisions

Closed Containers (8-1-321)

Eco2fume compositions consist of phosphine and carbon dioxide only. Therefore, Regulation 8, Rule 1 does not apply for this project.

Regulation 8 – Organic Compounds, Rule 2 – Miscellaneous Operations

Miscellaneous Operations (8-2-301)

Per Regulation 8-2-301, a facility will not discharge to the atmosphere emissions that contain more than 15 pounds per day and concentrations in the exhaust which is greater than 300 ppm of total carbon on a dry basis. Phosphine is not a carbon-based compound; thus this rule does not apply.

Federal Requirements

S-2 is not subject to any subpart of 40 CFR 60 for New Source Performance Standards or 40 CFR 63 for National Emission Standards for Hazardous Air Pollutants.

State Requirements

Phosphine is considered a restricted material under 3 CCR Section 6400. Advanced IPM is required to obtain a permit for the use of restricted materials through the county commissioner from the Alameda County Agriculture Department. The Restricted Materials and Permitting Program, developed by the California Department of Pesticide Regulations, outlines the requirements for the facility to obtain a permit as required by 3 CCR Section 6412. According to the permit issued by the Alameda County Agriculture Department, the Restricted Materials Permit expires during each calendar year and requires an annual renewal. Since the use of phosphine is prohibited without the use of a Restricted Material Permit, permit conditions will be included to ensure the material can only be used with a valid Restricted Material Permit at the facility. The Restricted Material Permit does not limit the amount of phosphine to be used but does require the permit holder to submit a notice of intent to the Agricultural department 24 hours in advance prior to commencement of fumigation operations.

CONDITIONS

I recommend the following permit condition for S-2:

COND# 27280-----

1. The owner/operator of S-2 shall use no more than 30.5 pounds of phosphine in any consecutive twelve-month period.
(Basis: Regulation 2-5)
2. The owner/operator of S-2 shall not fumigate cargo containers with greater volume than 1,360 cubic feet.
(Basis: Regulation 2-5)
3. The owner/operator of S-2 shall not fumigate more than 510 20-ft cargo containers per year.
(Basis: Regulation 2-5)

4. The owner/operator of S-2 shall maintain a valid Restricted Materials Permit at all times while S-2 is operational.
(Basis: Cumulative Increase, Title 3 CCR Section 6412)

5. To determine compliance with the Parts 1, the owner/operator of S-2 shall maintain the following records and provide all the data necessary to evaluate compliance with the above conditions, including, but not necessarily limited to, the following information:
 - a. Date, time, quantity and type of fumigant released for each fumigated container.
 - b. Emissions calculations of phosphine used at S-2 on a daily basis.
 - c. Emissions calculations of phosphine used at S-2 on a monthly basis.
 - d. Emission calculations shall be totaled for each consecutive twelve-month period.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, Regulation 2-5)

RECOMMENDATIONS:

The District has reviewed the permit application for the fumigator 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. Since the source is located within an overburden community, the public notification requirements of District Regulation 2-1-412 were triggered. After comments are received and reviewed, the District will make a final determination on the permit application.

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

S-2 Commodity Fumigation – Eco2fume (2.2% Phosphine)

Davis Zhu,
Senior Air Quality Engineer

9/26/2022
Date