

Engineering Evaluation Report
Equator Estate Coffees and Teas, P#15081
115 Jordan Street, San Rafael
Application #6693

I. BACKGROUND

Equator Estate Coffees and Teas is a small business currently located at 1525 E. Francisco Boulevard in San Rafael and has applied to move their existing facility (P#10875) to a new location in San Rafael. The facility has submitted an application for permits at the new location and will be moving the existing coffee roasting equipment and associated abatement devices. Since the sources will be relocated, they are considered new sources and are subject to all NSR requirements. The planned new location is within 1000 feet of a school.

The two Coffee Roasters, S-1 and S-2, are each abated by an Afterburner with integral Cyclone. The Coffee Roasters are batch units, 75 and 30 kilogram capacities respectively. The facility has requested permitted usage rates equivalent to the permit condition limits at their current location, 68.6 tpy for S-1 and 400 tpy for S-2.

**S-1, Batch Coffee Roaster, Petroncini TT-7-5, 75 kilo, natural gas 66,000 Btu/hr
abated by A-1, Afterburner, Petroncini TT-7-5, 900,000 Btu/hr
S-2, Batch Coffee Roaster, Toper TMK 30, 30 kilo, natural gas 240,000 Btu/hr
abated by A-2, Afterburner, Toper 2800, 1.25 MMBtu/hr**

II. EMISSION CALCULATIONS

The following emissions are based upon maximum projected throughputs and emission factors for abated Batch Coffee Roasters, taken from the Permit Handbook Section 11, Chapter 3, which are in turn based upon EPA AP-42, Chapter 9.13, 9/95 and Chapter 6.2-1, 2/72. The formaldehyde emission factor is also from the Permit Handbook Section 11, Chapter 3 for Batch Coffee Roasters. This factor was generated from the Toxic Air Contaminant Emission Inventory for the San Francisco Bay Area Status Report, 4/90. This factor represents unabated operation, so was reduced by the minimum expected abatement efficiency of 90% by weight.

S-1, Batch Coffee Roaster, 75 kilo/batch, 15 minutes/batch, 4 hrs/day, 2 days/wk, 52 wks/yr
abated by A-1, Afterburner:

For highest daily emissions, the maximum throughput given continuous operation:

$(75 \text{ kilo/batch})(\text{batch}/15 \text{ min})(60 \text{ min/hr})(24 \text{ hrs/d})(\text{lb}/0.4536\text{kilo})(\text{ton}/2000 \text{ lbs}) = 11.9 \text{ tpd, max}$

PM10:	$(68.6 \text{ tpy})(0.12 \text{ lbs/ton})$	=	8.2 lbs PM/yr
	$(11.9 \text{ tpd})(0.12 \text{ lbs/ton})$	=	1.4 lbs PM/highest day
VOC:	$(68.6 \text{ tpy})(0.047 \text{ lbs/ton})$	=	3.2 lbs VOC/yr
	$(11.9 \text{ tpd})(0.047 \text{ lbs/ton})$	=	0.6 lbs VOC/highest day
NOx:	$(68.6 \text{ tpy})(0.1 \text{ lbs/ton})$	=	6.9 lbs NOx/yr
	$(11.9 \text{ tpd})(0.1 \text{ lbs/ton})$	=	1.2 lbs NOx/highest day
CO:	$(68.6 \text{ tpy})(0.55 \text{ lbs/ton})$	=	37.7 lbs CO/yr
	$(11.9 \text{ tpd})(0.55 \text{ lbs/ton})$	=	6.5 lbs CO/highest day

Toxic Compound Emissions:

Formaldehyde = $(0.054 \text{ lb/ton})(68.6 \text{ ton/yr})(1 - 0.90) = 0.4 \text{ lb/yr}$

S-2, Batch Coffee Roaster, 30 kilo/batch, 15 minutes/batch, 8 hrs/day, 4 days/wk, 52 wks/yr
 abated by A-2, Afterburner:

For highest daily emissions, the maximum throughput given continuous operation:
 (30 kilo/batch)(batch/15 min)(60 min/hr)(24 hrs/d)(lb/0.4536 kilo)(ton/2000 lbs) = 3.2 tpd, max

PM10:	(400 tpy)(0.12 lbs/ton)	=	48 lbs PM/yr
	(3.2 tpd)(0.12 lbs/ton)	=	0.4 lbs PM/highest day
VOC:	(400 tpy)(0.047 lbs/ton)	=	18.8 lbs VOC/yr
	(3.2 tpd)(0.047 lbs/ton)	=	0.2 lbs VOC/highest day
NOx:	(400 tpy)(0.1 lbs/ton)	=	40 lbs NOx/yr
	(3.2 tpd)(0.1 lbs/ton)	=	0.3 lbs NOx/highest day
CO:	(400 tpy)(0.55 lbs/ton)	=	220 lbs CO/yr
	(3.2 tpd)(0.55 lbs/ton)	=	1.8 lbs CO/highest day

Toxic Compound Emissions:

Formaldehyde = (0.054 lb/ton)(400 ton/yr)(1- 0.90) = 2.2 lb/yr

III. EMISSION SUMMARY

This is a new facility with no existing cumulative increase. The resulting cumulative increase is as follows:

Pollutant	lb/yr	ton/yr
PM ₁₀	56.2	0.03
VOC	22.0	0.01
NOx	46.9	0.02
CO	257.7	0.13

IV. APPLICABLE REQUIREMENTS

A. Toxic Risk Assessment

The amount formaldehyde emitted from this operation, 2.6 lbs/year, is well below the toxic trigger screening level of 33 lbs/year. Therefore, a Toxic Risk Screen was not required, and TBACT does not apply.

B. Regulation 1 - General Provisions and Definitions

§1-301: This section prohibits discharging emissions in quantities that cause injury, detriment, nuisance or annoyance. The operation is expected to comply with this requirement.

C. Permits - General Requirements, Regulation 2, Rule 1

The project will be located within 1000 feet of the outer boundary of the nearest K-12 school and does cause an increase in toxic emissions. It is therefore subject to the public notification requirements of Regulation 2-1-412, even though the increase in toxic emissions is not large enough to require a Toxic Risk Screening. The applicant supplied information for the school within 1000 feet, James B. Davidson Middle School. Since the public notice requirements are triggered, notification must also be provided to any other school within ¼ mile of the project. The applicant indicated that there is one additional school within that radius, Laurel Dell Elementary. This was confirmed by the District's databank search.

An online search has turned up one additional school, Sun Valley Elementary at 150 Lovell Avenue. The school is open and relocated to this location recently, while their original site (75 Happy Lane) is being renovated. The students will be present at this

site through the end of the school year in June. This school will also be included in the public notice.

James B Davidson Middle, 240 Woodland Ave. 415-485-2400 0.1mi

Sun Valley Elementary, 150 Lovell Ave. 415 485-2440 0.1mi

Laurel Dell Elementary, 225 Woodland Ave. 415-485-2317 0.2mi

D. Permits - New Source Review, Regulation 2, Rule 2

1. Best Available Control Technology Requirements, §2-2-301: A Best Available Control Technology (BACT) review is required for any new or modified source which may have POC, NPOC, NO_x, SO₂, PM₁₀, or CO emissions greater than 10 pounds per highest day. The emissions from these two new sources will be less than 10 pounds per day; therefore, BACT is not triggered.
2. Offset Requirements, §2-2-303: Total facility emissions will be less than 100 tons per year. Therefore, this facility is not required to provide emission offsets.
3. Prevention of Significant Deterioration (PSD) Requirements, §2-2-304: The District's requirements for PSD apply to emissions of sulfur dioxide, nitrogen dioxide, carbon monoxide, and PM₁₀. However, as this facility is not a major facility and the facility's cumulative increase does not exceed 15 tons per year, the PSD requirements do not apply.

E. Regulation 3 - Fees

This regulation requires payment of operating fees. The facility is expected to comply with this requirement.

F. Particulate Matter and Visible Emissions, Regulation 6

1. Section 301 prohibits for more than 3 minutes per hour, visible emissions as dark or darker than Ringelmann 1 or equivalent opacity. This operation is expected to comply with this standard.
2. Section 305 prohibits emissions of visible particles from causing a nuisance on property other than the operator's. This operation is expected to comply with this standard.

G. Odorous Substances, Regulation 7: The standards in this rule apply, and the operation is expected to comply with these standards, included as permit conditions.

H. NSPS/NESHAPS

There is no New Source Performance Standard or National Emission Standard for Hazardous Air Pollutants that applies to this source.

I. CEQA

This project is considered to be ministerial under the District's CEQA Regulation 2-1-311. The engineering review for this project requires only the application of standard permit conditions and standard emission factors as defined in the Permit Handbook, Section 11, Chapter 3 and therefore is not discretionary as defined by CEQA. A ministerial project is not considered discretionary, as defined by CEQA and therefore is not subject to CEQA review.

V. PERMIT CONDITIONS #20263 and 20264

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Conditions for S-1, Batch Coffee Roaster, Petroncini TT-7-5, 75 kilo, natural gas 66,000 Btu/hr abated by A-1, Afterburner, Petroncini TT-7-5, 900,000 Btu/hr

1. The total amount of green coffee beans roasted at Batch Coffee Roaster, S-1, shall not exceed 68.6 tons (137,200 pounds) totaled over any consecutive 12-month period.
(Basis: Cumulative Increase)
2. The Batch Coffee Roaster, S-1, shall be abated by all times by A-1, Afterburner.
(Basis: Cumulative Increase)
3. The Permit to Operate for S-1, Batch Coffee Roaster, is contingent upon compliance with Regulation 1-301, Standard for Public Nuisance, and Regulation 7, Odorous Substances. Upon receipt of a violation for either of these statutes, the Air Pollution Control Officer (APCO) may require the operator to:
 - a. Conduct, within 30 days of notification by the APCO, a District-approved source test to establish proper functioning of A-1, Afterburner;
 - b. Submit, within 60 days of notification by the APCO, a permit application for an Authority to Construct additional emission control; and/or
 - c. Curtail operations until either the operation can be modified or the meteorological conditions change, such that the community is no longer adversely impacted.
(Basis: Regulation 1-301, 7-301, 7-302, 7-303)
4. In order to demonstrate compliance with the above conditions, the Permit Holder shall maintain the following records in a District approved log and provide all of the data necessary to evaluate compliance with the above conditions, including the following information:
 - a. Monthly records of the quantity of green coffee beans roasted at S-1.
 - b. Monthly throughput records shall be totaled for each consecutive 12-month period.All records shall be retained on-site for a period of 2 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 1-441)

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S-2, Batch Coffee Roaster, Toper TMK 30, 30 kilo, natural gas 240,000 Btu/hr
abated by A-2, Afterburner, Toper 2800, 1.25 MMBtu/hr

1. The total amount of green coffee beans roasted at Batch Coffee Roaster, S-2, shall not exceed 400 tons (800,000 pounds) totaled over any consecutive 12-month period.
(Basis: Cumulative Increase)
2. The Batch Coffee Roaster, S-2, shall be abated by all times by A-2, Afterburner.
(Basis: Cumulative Increase)
3. The volatile organic compound emissions from S-2, Batch Coffee Roaster, shall not exceed 1 pound per 100 pounds of green coffee beans roasted.
(Basis: Cumulative Increase)
4. The minimum furnace temperature of A-2 shall be at least 1300 degrees F. This temperature may be adjusted by the District if source test data demonstrate that an alternate temperature is necessary for or capable of maintaining compliance with Condition 3 above.
(Basis: Regulation 2-1-403)
5. The A-2, Afterburner, shall be equipped with a temperature measuring device capable of continuously measuring and recording the temperature. This device shall be maintained in

accordance with manufacturer's recommendations. This temperature monitor shall be used to determine compliance with the temperature requirements in Condition 4 above.
(Basis: Regulation 1-521)

6. The Permit to Operate for S-2, Batch Coffee Roaster, is contingent upon compliance with Regulation 1-301, Standard for Public Nuisance, and Regulation 7, Odorous Substances. Upon receipt of a violation for either of these statutes, the Air Pollution Control Officer (APCO) may require the operator to:
 - a. Conduct, within 30 days of notification by the APCO, a District-approved source test to establish proper functioning of A-2, Afterburner;
 - b. Submit, within 60 days of notification by the APCO, a permit application for an Authority to Construct additional emission control; and/or
 - c. Curtail operations until either the operation can be modified or the meteorological conditions change, such that the community is no longer adversely impacted.

(Basis: Regulation 1-301, 7-301, 7-302, 7-303)

7. In order to demonstrate compliance with the above conditions, the Permit Holder shall maintain the following records in a District approved log and provide all of the data necessary to evaluate compliance with the above conditions, including the following information:
 - a. Monthly records of the quantity of green coffee beans roasted at S-2.
 - b. Monthly throughput records shall be totaled for each consecutive 12-month period.
 - c. Temperature records from Condition 5 above.

All records shall be retained on-site for a period of 2 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 1-441)

VI. RECOMMENDATION

I recommend issuing an Authority to Construct for:

**S-1, Batch Coffee Roaster, Petroncini TT-7-5, 75 kilo, natural gas 66,000 Btu/hr
abated by A-1, Afterburner, Petroncini TT-7-5, 900,000 Btu/hr**

**S-2, Batch Coffee Roaster, Topper TMK 30, 30 kilo, natural gas 240,000 Btu/hr
abated by A-2, Afterburner, Topper 2800, 1.25 MMBtu/hr**

By _____
Tamiko Endow, Air Quality Engineer II

Date _____