

# DRAFT

**Engineering Evaluation Report  
Catahoula Coffee Company and Roastery  
12472 San Pablo Avenue  
Richmond, CA 94805  
Plant # 16461  
Application # 10807**

## I. BACKGROUND

Catahoula Coffee Company & Roastery (CCC&R) wants to open a coffee house and roastery in Richmond. The owner currently operates a Merry Maid Cleaning Service office at the location. He plans to convert the existing business into a high-end coffee house. They have purchased a small batch roaster and are applying for an Authority to Construct the following equipment:

### **S-1 Coffee Roaster, San Franciscan, Model SF25B, 100 pounds per hour abated by Thermal Oxidizer, A-1, San Franciscan Model SF 25-B-I**

The coffee roaster is complete with a cyclone separator designed as a separate chamber after the roaster. This cyclone separator serves two functions: 1) to separate chaff and the other particulate matter from the hot air exhausted from the roaster and, 2) to provide an air entrance into the thermal oxidizer. The hot air discharge from the roaster is processed in the thermal oxidizer at a minimum of 1250 degrees F and with a residence time in excess of 0.5 seconds.

The applicant indicates a projected green bean throughput of 15.6 tons per year. However, this application will be evaluated for 30 tons per year to allow for future growth.

## II. EMISSION CALCULATIONS

Emission increases from combustion of natural gas at the batch roaster and thermal oxidizer:

Basis:

- Coffee Throughput = 60,000 lb/yr = 30 tons/yr
- Operation hours = 60,000 lbs/yr/100 lb/hr = 600 hours/yr
- Roaster Firing Rate = 100,000 BTU/hr
- Afterburner Firing Rate = 200,000 BTU/hr
- Total fuel throughput = 200,000 + 100,000 BTU/hr (600 hr/yr) = 180.00 MMBTU/yr of natural gas.
- Heat capacity = 1,050 MMBtu/10<sup>6</sup> ft<sup>3</sup> natural gas
- A-1 VOC Destruction Efficiency 90% by weight
- Emission factors taken from AP-42, Table 1.4-2 (revised 7/1/98) for small boiler <100 MMBtu/hr
  - NO<sub>x</sub> = (100 lb/ MMscf)/(1050 MMBtu/10<sup>6</sup> ft<sup>3</sup>) = 0.095 lb/MMBtu
  - CO = (84 lb/ MMscf)/(1050 MMBtu/10<sup>6</sup> ft<sup>3</sup>) = 0.08 lb/MMBtu
  - SO<sub>2</sub> = (0.6 lb/MMscf)/(1050 MMBtu/10<sup>6</sup> ft<sup>3</sup>) = 5.7 x 10<sup>-4</sup> lb/MMBtu
  - PM<sub>10</sub> = (7.6 lb/MMscf)/(1050 MMBtu/10<sup>6</sup> ft<sup>3</sup>) = 0.00724 lb/MMBtu
  - POC = (5.5 lb/MMscf)/(1050 MMBtu/10<sup>6</sup> ft<sup>3</sup>) = 0.00524 lb/MMBtu

$$NPOC = (2.3 \text{ lb/MMscf}) / (1050 \text{ MMBTU} / 10^6 \text{ ft}^3) = 0.00219 \text{ lb/MMBtu}$$

Combustion Emission Calculations:

NO<sub>x</sub> = 180 MMBtu/yr X 0.095 lb/MMBtu = 17.1 lb/yr  
 CO = 180 MMBtu/yr X 0.08 lb/MMBtu = 14.4 lb/yr  
 SO<sub>2</sub> = 180 MMBtu/yr X 0.00057 lb/MMBtu = 0.1 lb/yr  
 PM<sub>10</sub> = 180 MMBtu/yr X 0.00724 lb/MMBtu = 1.3 lb/yr  
 POC = 180 MMBtu/yr X 0.00524 lb/MMBtu = 0.9 lb/yr,  
 NPOC = 180 MMBtu/yr X 0.00219 lb/MMBtu = 0.4 lb/yr

All emissions are less than 1 lb per day.

Emission increases from batch roaster:

Emission factors (batch roaster abated by thermal oxidizer) for emissions of particulate, NO<sub>x</sub>, CO, and organics are taken from Permit Handbook Section 11.3, "Coffee Roasters".

Pollutant	Emission Factors (lb/ton)	Throughput (ton.yr)	Maximum Daily Emissions (lb/day)	Annual Average Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Maximum Annual Emissions (TPY)
NO <sub>x</sub>	0.10	30	0.019	0.008	3	0.0015
PM10	0.12	30	0.023	0.01	3.6	0.0018
POC	0.047	30	0.009	0.004	1.4	0.0007
CO	0.55	30	0.11	0.04	16.5	0.008

Compliance with Regulation 6

Regulation 6-310 Particulate Weight Limitation:

Basis: 1 hour of roaster operation  
 100 lbs/hr roaster capacity  
 roaster emission point: 254 scfm @ 400 degrees F  
 Limitation of 0.15 grain/dscf

Grain Loading calculation from coffee roasting process:

$[4.9 \text{ lb PM}_{10}/\text{yr} \times 7000 \text{ grain/lb}] / [60 \text{ min/hr} \times 600 \text{ hr/yr} \times 254 \text{ dscfm}] = 0.004 \text{ grain/dscf}$

**III. PLANT CUMULATIVE INCREASE**

Pollutant	Current TPY	Annual Emissions (lbs/yr)	Maximum Annual Emissions (TPY)
NO <sub>x</sub>	0	20.1	0.01
PM10	0	4.9	0.002
Organic (VOC)	0	2.3	0.001
CO	0	30.9	0.02

#### IV. TOXIC RISK SCREENING ANALYSIS

Toxic Pollutant	Controlled Emission Factors** (lb/ton)	Annual Emissions (lbs/yr)	Maximum Annual Emissions (TPY)
Formaldehyde	0.2	6	33

\*\*Controlled Emission Factors: (per District Permit Handbook Chapter 11.3)

No toxic risk screen is necessary.

#### V. BACT ANALYSIS

BACT is not required for S-1 (Coffee Roaster), because criteria pollutant emissions do not exceed 10 pounds per worst-case day.

#### VI. OFFSET ANALYSIS

Offsets are not required since facility POC and NOx emissions do not exceed 15 ton/yr.

#### VII. CEQA REVIEW

This application is considered to be ministerial under the District's CEQA guidelines (Regulation 2-1-311) and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 11.3.

#### VIII. STATEMENT OF COMPLIANCE

Source S-1 will comply with Regulation 6 as the estimated particulate emission of 0.004 gr/dscf will comply with the 0.15 gr/dscf standard allowed per Regulation 6-310.

NSPS, PSD, and NESHAPS are not triggered.

This project is within 1000 feet of the following school:

***Wilson Elementary School - West Contra Costa Country School District  
629 42<sup>nd</sup> Street  
Richmond, CA 94805  
School Enrollment: Approximately 552 students***

The District school program showed another school within 1000 feet of the proposed project. However, that school is no longer in operation at that location.

CCC&R is subject to the public notification requirement of Regulation 2-1-412. A public notice will be prepared and posted on the Internet and mailed to all parents and guardians of students enrolled at Wilson Elementary School. It will be mailed to all residential neighbors located within 1000 feet of the proposed new source of pollution.

At the end of the comment period (30 days), there were xxx written comments, xxx phone messages and xxxx e-mail messages received from parents of students at Wilson elementary school.

## **IX. CONDITIONS**

- 1. The owner/operator shall not roast more than 30 tons of green coffee beans in S-1 totaled over any consecutive 12-month period. [Basis: Cumulative Increase]**
- 2. The owner/operator shall abate S-1 Coffee Roaster at all times by A-1 Thermal Oxidizer. [Basis: Cumulative Increase]**
- 3. The owner/operator shall maintain a minimum furnace temperature of A-1 to be at least 1250° F. [Basis: Regulation 2-1-403]**
- 4. The owner/operator shall ensure that A-1 Thermal Oxidizer be equipped with a temperature-measuring device capable of continuously measuring and recording the temperature in A-1 Thermal Oxidizer. This device shall be accurate to within 10 degrees Fahrenheit (° F) and shall be maintained in accordance with manufacturer's recommendations. This temperature monitor shall be used to determine compliance with the temperature requirements in Condition 3. [Basis: Regulation 1-521]**
- 5. The permit to operate for S-1 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 may require the operator to 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]**
- 6. To demonstrate compliance with the above conditions, the owner/operator shall maintain the following records 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 usage records shall be totaled for each consecutive 12-month period.**
  - c. Records of continuous temperature measurements of A-1 Thermal Oxidizer whenever S-1 Coffee Roaster is in operation.**

**All records shall be retained onsite for two years from the date of entry, and made available for inspection by District staff upon request. These record-keeping requirements shall not replace the record keeping requirements contained in any applicable District Regulations. [Basis: Cumulative Increase]**

## **X. RECOMMENDATION**

It is recommended that Authority to Construct be granted to Catahoula Coffee Company & Roastery for:

**S-1 Coffee Roaster, San Franciscan, Model SF25B, 100 pounds per hour abated by Thermal Oxidizer, A-1, San Franciscan Model SF 25-B-I**

By: \_\_\_\_\_  
Nancy Yee  
Air Quality Engineer

\_\_\_\_\_ Date