

DRAFT
Engineering Evaluation
Wrecking Ball Coffee Roasters
Plant Number 23019
Application Number 27127

1.0 BACKGROUND

Wrecking Ball Coffee Roasters is applying for an Authority to Construct and/or Permit to Operate the following new equipment:

- S-1 Coffee Roaster: Natural Gas, Probat, L12, 12 Kg Capacity; abated by A-1, Direct Flame Afterburner, Dirty David, 0.85 MMBtu/hr Firing Rate.**

2.0 EMISSIONS SUMMARY

Basis:

- Emission factors for Particulate Matter 10 (PM10), Precursor Organic Compound (POC), and Carbon Monoxide (CO) are from the Permit Handbook Chapter 11.3, which are taken from AP-42 (Fifth Edition, Volume I) Chapter 9.13.2 (Coffee Roasting)
- The annual emissions are based on an annual throughput of 80 tons of green coffee bean.
- The maximum daily emissions are estimated using the maximum capacity of the coffee roaster. The roaster can process up to 12 kg per batch, and it takes at least 15 minute to complete one batch. Since no daily limit will be imposed, the roaster can be operated 24 hours a day. Therefore, the maximum daily throughput is 1.27 tons.

Pollutant	Emission Factor (lb/ton)	Annual Emissions (lb/yr)	Annual Emissions (ton/yr)	Max. Daily Emissions (lb/day)
PM10	0.12	9.6	0.005	0.15
POC	0.047	3.76	0.002	0.06
CO	0.55	44	0.022	0.70

- Emission factors for Nitrogen Oxides (NOx) and Sulfur Dioxide (SO2) are from the Permit Handbook Chapter 11.3, which are taken from AP-42 (Fifth Edition, Volume I) Chapter 1.4 (Natural Gas Combustion)
- The emissions are based on the maximum firing rates of the roaster and afterburner¹:
 Natural Gas Firing Rate = (0.964 MMBtu/hr) (MMSCF/1020 MMBtu) = 0.000927 MMSCF/hr
- Since no natural gas usage limit will be imposed, the roaster and afterburner are can be operated 24 hours a day and 365 days a year. Therefore,

Pollutant	Emission Factor (lb/MMSCF)	Annual Emissions (lb/yr)	Annual Emissions (ton/yr)	Max. Daily Emissions (lb/day)
NOx	100	812.05	0.406	2.22

¹ In this evaluation, “MMBtu” stands for Million British Thermal Units, and “MMSCF” stands for Million Standard Cubic Feet.

SO2	0.6	4.87	0.002	0.01
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2.1 Plant Cumulative Increase:

Pollutant	Existing (ton/yr)	New (ton/yr)	New Total
PM10	0	0.005	0.005
POC	0	0.002	0.002
CO	0	0.022	0.022
NOx	0	0.406	0.406
SO2	0	0.002	0.002

2.2 Toxics:

Emissions from coffee roasting may contain formaldehyde, acetaldehyde, and acrolein, which are defined as toxic air contaminants in Regulation 2-5. According to the Permit Handbook Chapter 11.3, emission factors for formaldehyde and acetaldehyde are based on source testing performed at Peets Coffee and Tea. For acrolein, the California Air Resources Board has invalidated the source test method. Until CARB approves a new test method and acrolein emissions are estimated from factors developed using the new test method, the District is not evaluating risk for acrolein.

Formaldehyde = (0.0008 lb/ton) (80 ton/yr) = **0.064 lb/yr vs. chronic trigger level of 18 lb/yr**

Acetaldehyde = (0.0005 lb/ton) (80 ton/yr) = **0.04 lb/yr vs. chronic trigger level of 38 lb/yr**

Formaldehyde = (0.0008 lb/ton) (0.053 ton/hr) = **0.000042 lbs/hr vs. acute trigger level of 0.12 lb/hr**

Acetaldehyde = (0.0005 lb/ton) (0.053 ton/hr) = **0.000027 lbs/hr vs. acute trigger level of 1lb/hr**

As illustrated above, the toxic compound emissions are below their chronic and acute trigger levels; therefore, a health risk screening analysis is not required.

2.3 Best Available Control Technology:

Regulation 2-2-301 requires the use of Best Available Control Technology (BACT) for the control of criteria emissions from sources that emit greater than 10 lbs/day. In this case, BACT is not required since emissions from S-1 do not exceed 10 pounds per highest day for any single pollutant.

2.4 Offsets:

Offsets are not required because permitted POC and NO_x emissions for the facility are each expected to be less than 10 ton/yr.

3.0 STATEMENT OF COMPLIANCE

S-1, Coffee Roaster, is subject to the particulate emission standards of Regulation 6-1 and is expected to comply with the following standards: 6-1-301 (Ringelmann No. 1 limitation), 6-1-302 (Opacity limitation), 6-1-303 (Ringelmann No. 2 limitation), 6-1-305 (Visible Particles), 6-1-310 (Particulate Weight Limitation) and 6-1-311 (General Operations). Compliance is expected as emissions from S-1 shall be abated by a direct flame afterburner.

This application is considered to be ministerial under the District's 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.

The facility is within 1,000 feet from the nearest school and is therefore subject to the public notification requirements of Regulation 2-1-412. Notifications will be distributed to parents or guardians of children enrolled at Presidio Knolls School and all residential and business neighbors within 1,000 feet of the proposed new source.

PSD, NSPS, and NESHAPS do not apply.

4.0 PERMIT CONDITIONS

Proposed Permit Condition for S-1, Coffee Roaster, is shown below:

1. The owner/operator shall not process more than 80 tons of green coffee beans at S-1, Coffee Roaster, during any consecutive 12-month period.

[basis: Cumulative Increase]

2. The owner/operator shall abate S-1, Coffee Roaster, at all times while operating by A-1, Direct Flame Afterburner. [basis: Cumulative Increase]

3. To demonstrate compliance with Part 1 above, 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, Coffee Roaster.

b. Monthly usage records shall be totaled for each consecutive 12-month period.

All records shall be retained onsite for at least 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]

5.0 RECOMMENDATION

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 Authorities to Construct for the equipment listed below. However, the proposed source will be located within 1000 feet of a school, which triggers the

public notification requirements of District Regulation 2-1-412.6. 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 Authorities to Construct for the following source:

S-1 Coffee Roaster: Natural Gas, Probat, L12, 12 Kg Capacity; abated by A-1, Direct Flame Afterburner, Dirty David, 0.85 MMBtu/hr Firing Rate.

By: _____ Date: _____

Xuna Cai
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