Attachment 3

2010 Emissions Calculations

Kraft Foods Inc.
Plant No. 167, Application No. 23324
BAAQMD August 2012

2010 Actual PM10 Emissions

Source	Description	Maximum Hourly Throughput	2010 Throughput	Units	Unabated Emission Factor	Abatement Factor	Emission Factor	Units	Particulate (tons/year)	Reference
37	Max Pax Roaster #1, 4 MMBtu/hour, Abatement 4 MMBtu/hour		5904.9	MMBtu			0.00745	lb/MMBtu	0.022	AP-42 Table 1.4-2, 7/98
37	Max Pax Roaster #1	1.8	2770	tons			0.1920	lb/ton	0.266	AP-42 Table 9.13.2-1, 9/95
38	Max Pax Cooler #1	1.8	2770	tons			0.0280	lb/ton	0.039	AP-42 Table 9.13.2-1, 9/95
39	Max Pax Destoner #1	1.8	2770	tons			0.0280	lb/ton	0.039	AP-42 Table 9.13.2-1, 9/95
40	Max Pax Roaster #2, 4 MMBtu/hour, Abatement 4 MMBtu/hour		7747.3	MMBtu			0.00745	lb/MMBtu	0.029	AP-42 Table 1.4-2, 7/98
40	Max Pax Roaster #2	1.8	3630	tons			0.1920	lb/ton	0.348	AP-42 Table 9.13.2-1, 9/95
41	Max Pax Cooler #2	1.8	3630	tons			0.0280	lb/ton	0.051	AP-42 Table 9.13.2-1, 9/95
42	Max Pax Destoner #2	1.8	3630	tons			0.0280	lb/ton	0.051	AP-42 Table 9.13.2-1, 9/95
46	DECAF. System #1 - Green Coffee Transfer	10	46900	tons	0.79	0.01	0.0079	lb/ton	0.185	District Databank
47	DECAF. System #2 - Green Coffee Cleaning	10	46900	tons	3.15	0.01	0.0315	lb/ton	0.739	District Databank
48	DECAF. System #3 - Green Coffee Blend	10	46900	tons	2.36	9.00E-03	0.0212	lb/ton	0.498	District Databank
49	DECAF. System #4 - DECAF Bean System	5	46900	tons	0.85	0.01	0.0085	lb/ton	0.199	District Databank
50	DECAF. System #5 - Transfer & Storage	10	46900	tons	0.85	0.01	0.0085	lb/ton	0.199	District Databank
51	DECAF. System #6 - Plant General System	0.02	46900	tons	0.02	0.01	0.0002	lb/ton	0.005	District Databank
55	Airveyor System A	20	15600	tons	1.4	0.01	0.0140	lb/ton	0.109	District Databank
56	Airveyor System B	20	15600	tons	1.4	0.01	0.0140	lb/ton	0.109	District Databank
57	Airveyor System C	20	15600	tons	1.4	0.01	0.0140	lb/ton	0.109	District Databank
61	General Chaff Collection & Conveyor System	9.5	281	tons	1.85	2.00E-05	3.70E-05	lb/ton	0.000	District Databank
70	Whole Roasted Bean Airveyor System	7.5	46900	tons	0.11	1	0.1100	lb/ton	2.580	District Databank
71	Whole Roasted Bean Airveyor Receiving Hopper	7.5	46900	tons	0.12	0.15	0.0180	lb/ton	0.422	District Databank
72	Neotec Roaster #1, 6 MMBtu/hour, Abatement 4 MMBtu/hour		8412.3	MMBtu			0.00745	lb/MMBtu	0.031	AP-42 Table 1.4-2, 7/98
72	Neotec Roaster #1	2.7	7880	tons			0.1920	lb/ton	0.756	AP-42 Table 9.13.2-1, 9/95
73	Neotec Roaster #2, 6 MMBtu/hour, Abatement 4 MMBtu/hour		8592.7	MMBtu			0.00745	lb/MMBtu	0.032	AP-42 Table 1.4-2, 7/98
73	Neotec Roaster #2	2.7	8050	tons			0.1920	lb/ton	0.773	AP-42 Table 9.13.2-1, 9/95
74	Neotec Cooler #1	2.7	7880	tons			0.0340	lb/ton	0.134	Neotec Guarantee for Neotec No. 4
75	Neotec Cooler #2	2.7	8050	tons			0.0340	lb/ton	0.137	Neotec Guarantee for Neotec No. 4
76	Neotec Destoner #1	2.7	7880	tons			0.0340	lb/ton	0.134	Neotec Guarantee for Neotec No. 4
77	Neotec Destoner #2	2.7	8050	tons			0.0340	lb/ton	0.137	Neotec Guarantee for Neotec No. 4
78	System 200 Green Bean Airveyor	20	46900	tons	1	0.01	0.010	lb/ton	0.235	District Databank
79	System 300 Cyclone Receiver	17.5	46900	tons	1	0.01	0.010	lb/ton	0.235	District Databank
80	System 400 Max Pax Filter Receiver	17.5	46900	tons	1	0.0102	0.01020	lb/ton	0.239	District Databank
81	System 400 Neotec Filter Receiver #1	17.5	7880	tons	1	0.0102	0.01020	lb/ton	0.040	District Databank
82	System 400 Neotec Filter Receiver #2	17.5	8050	tons	1	0.0102	0.01020	lb/ton	0.041	District Databank
83	System 400 Small Thermelo Filter Receiver	17.5	0	tons	1	0.0102	0.01020	lb/ton	0.000	District Databank
84	System 700 Filter Receiver #1	6	18100	tons	1	0.0102	0.01020	lb/ton	0.092	District Databank
85	System 700 Filter Receiver #2	12.5	16100	tons	1	0.0102	0.01020	lb/ton	0.092	District Databank
86	Bulk Green Coffee Unloader	20	18800	tons	1	0.0010	0.00100	lb/ton	0.009	District Databank
87	Super Bag Fill Station	5	0	tons	1	0.001	0.001	lb/ton	0.000	District Databank
88	Bag Coffee Dump Station	6	28100	tons	1	0.0010	0.00100	lb/ton	0.014	District Databank
89	Conveyor/Transfer Line	2.7	46900	tons	1	0.1000	0.10000	lb/ton	2.345	District Databank
90	Neotec Roaster #3, 6 MMBtu/hour, Abatement 4 MMBtu/hour		12041.5	MMBtu			0.00745	lb/MMBtu	0.045	AP-42 Table 1.4-2, 7/98
90	Neotec Roaster #3	2.7	11300	tons			0.19200	lb/ton	1.085	AP-42 Table 9.13.2-1, 9/95
91	Neotec Cooler #3	2.7	11300	tons			0.0340	lb/ton	0.192	Neotec Guarantee for Neotec No. 4
92	Neotec Destoner #3	2.7	11300	tons			0.0340	lb/ton	0.192	Neotec Guarantee for Neotec No. 4
93	Green Bean Unloading, Clean Weigh		46900	tons	1	0.0100	0.01000	lb/ton	0.235	District Databank
94	Coffee Conveying and Blending System 1		9380	tons	1	5.00E-04	0.00050	lb/ton	0.002	District Databank
95	Coffee Conveying and Blending System 2		9380	tons	1	5.00E-03	0.00500	lb/ton	0.023	District Databank
96	Coffee Conveying and Blending System 3		9380	tons	1	5.00E-03	0.00500	lb/ton	0.023	District Databank
97	Coffee Conveying and Blending System 4		9380	tons	1	5.00E-03	0.00500	lb/ton	0.023	District Databank
98	NABQB Coffee Conveying and Blending System		9380	tons	1	5.00E-04	0.00050	lb/ton	0.002	District Databank
99	Fire Pump Diesel Engine (208 hp, 0.25 g/bhp-hr)		57.7	hours			0.1146	lb/hour	0.003	Data Form
101	Green Bean Conveying System		13000	tons	1	1.00E-02	0.01000	lb/ton	0.065	District Databank
102	Neotec Roaster #4, 6 MMBtu/hour, Abatement 4 MMBtu/hour		13892.3	MMBtu			0.00745	lb/MMBtu	0.052	AP-42 Table 1.4-2, 7/98
102	Neotec Roaster #4		13000	tons			0.19200	lb/ton	1.248	AP-42 Table 9.13.2-1, 9/95
103	Neotec Cooler #4		13000	tons			0.0340	lb/ton	0.221	Neotec Guarantee for Neotec No. 4
104	Neotec Destoner #4		13000	tons			0.0340	lb/ton	0.221	Neotec Guarantee for Neotec No. 4
32001	Boiler, Natural Gas, 3.5 MMBtu/hour		0	MMBtu			0.00745	lb/MMBtu	0.000	AP-42 Table 1.4-2, 7/98
A-104	Recuperative Thermal Oxidizer, 3.5 MMBtu/hour		1432.3	MMBtu			0.00745	lb/MMBtu	0.005	AP-42 Table 1.4-2, 7/98
Total All Particulate (tons/year)									15.115	

Note. AP-42 (Table 9.13.2-1, 9/95) Cooler Emission Factor of 0.028 lb/ton for S-37 and S-40 includes condensible particulate matter (See Nestle Source Test Report for testing performed at Nestle Union City on September 18, 1992).
Neotec provided a vendor guarantee for cooler emissions at 0.034 lb/ton for Application No. 16923/21497. This guarantee will be used to estimate emissions from the Neotec Coolers.
Destoner PM10 emissions assumed to be equal to Cooler PM10 emissions.

Kraft Foods Inc.
Application No. 23324
BAAQMD August 2012

2010 Actual Emissions for NOx, CO, POC, SO2, Formaldehyde, and Acetaldehyde

Coffee Roaster Emission Factors for NOx, CO, POC, Formaldehyde, and Acetaldehyde from 2010 Source Testing. Coffee Roaster Emission Factor for SO2 from 1998 Source Test on S-72

	Capacity (tons/hour)	2010 Throughput (tons/year)	Test Date	Actual NOx (lb/ton)	Actual CO (lb/ton)	Actual POC (lb/ton)	District EF SO2 (lb/ton)	Actual Formaldehyde (lb/ton)	Actual Acetaldehyde (lb/ton)
S-37 Max Pax Roaster No. 1	1.8	2783	8/18/2010	0.969	11.968	1.82	0.05	0.19	0.0838
S-40 Max Pax Roaster No. 2	1.8	3651	8/27/2010	1.403	15.01	0.737	0.05	0.319	0.323
S-72 Neotec Roaster No. 1	2.7	7929	8/17/2010	0.59	3.202	0.275	0.05	0.199	0.116
S-73 Neotec Roaster No. 2	2.7	8098	8/18/2010	0.787	0.963	0.243	0.05	0.301	0.128
S-90 Neotec Roaster No. 3	2.7	11349	9/1/2010	1.009	0.199	0.049	0.05	0.0625	0.0151
S-102 Neotec Roaster No. 4	4	13093	12/1/2009	0.783	0.267	0.041	0.05	0.0434	0.0177
Total		46903							

Coffee Roaster Emissions of NOx, CO, POC, SO2, Formaldehyde, and Acetaldehyde in tons/year (based on 2010 throughputs)

	Capacity (tons/hour)	2010 Throughput (tons/year)	Test Date	NOx (ton/year)	CO (ton/year)	POC (ton/year)	SO2 (ton/year)	Formaldehyde (lb/year)	Acetaldehyde (lb/year)
S-37 Max Pax Roaster No. 1	1.8	2783	8/18/2010	1.35	16.65	2.53	0.07	528.8	233.2
S-40 Max Pax Roaster No. 2	1.8	3651	8/27/2010	2.56	27.40	1.35	0.09	1164.7	1179.3
S-72 Neotec Roaster No. 1	2.7	7929	8/17/2010	2.34	12.69	1.09	0.20	1577.9	919.8
S-73 Neotec Roaster No. 2	2.7	8098	8/18/2010	3.19	3.90	0.98	0.20	2437.5	1036.5
S-90 Neotec Roaster No. 3	2.7	11349	9/1/2010	5.73	1.13	0.28	0.28	709.3	171.4
S-102 Neotec Roaster No. 4	4	13093	12/1/2009	5.13	1.75	0.27	0.33	568.2	231.7
Total		46903		20.29	63.52	6.50	1.173	6986.36	3771.91

Notes:
S-72 and S-73 have a combined annual permit limit of 54000 tons/year
SO2 Emission Factor from BAAQMD Source Test Report No. 99125 (11/4/98) for testing performed on S-72.
The natural gas combustion SO2 is included in the 3.501 tons SO2/year estimate.
The formaldehyde and acetaldehyde source test based emission factors include the amount contributed from natural gas combustion.

Other Combustion Sources and Abatement Devices Emissions of NOx, CO, POC, SO2, Formaldehyde, and Acetaldehyde in tons/year

				NOx (ton/year)	CO (ton/year)	POC (ton/year)	SO2 (ton/year)	Formaldehyde (lb/year)	Acetaldehyde (lb/year)
S-99 Emergency Standby Diesel Firepump				0.082	0.033	0.018	0.0001	0.60	0.06
S-32001 Natural Gas Fired Boiler				0.00	0.00	0.00	0.00	0.00	0.00
A-104 Recuperative Thermal Oxidizer				0.07	0.06	0.00	0.00	0.11	0.01
Total All Combustion				**20.44**	**63.62**	**6.52**	**1.17**	**6987.06**	**3771.98**

Kraft Foods Inc.
Plant No. 167, Application No. 23324
BAAQMD August 2012

2010 Actual Emissions for S-99 Emergency Standby Diesel Firepump

Diesel Engine Emissons

Engine Emissions from Application 8151 (2003)
Rated Horsepower: **208** Nameplate
S-99 Diesel Fire Pump Maxwell House Division of Kraft Foods

	g/kw-hr	(g/hp-hr)
NOx		6.9000
CO		2.7500
POC		1.5000
PM_{10}		0.2500
SO_2		0.0055

g/kw-hr
NOx & POC

95% NOx
5% POC

**The emission factor for SO2 is from Chapter 3, Table 3.4-1 of the EPA Document AP-42, Compilation of Air Pollutant Emission Factors.*
SO_2: 8.09E-3 (% S in fuel oil) lb/hp-hr = 8.09E-3 (0.0015% S) (453.6 g/lb) = 0.0055 g/hp-hr

Annual Emissions

Pollutants	Factors	Annual (lb/yr)	Annual (TPY)
NOx	6.9000	1582.011	0.791
CO	2.7500	630.511	0.315
POC	1.5000	343.915	0.172
PM_{10}	0.2500	57.319	0.029
SO_2	0.0055	1.261	0.0006

Maximum Daily Emissions

Pollutants	Factors	Daily (lb/day)
NOx	6.900	75.937
CO	2.750	30.265
POC	1.500	16.508
PM_{10}	0.250	2.751
SO_2	0.0055	0.061

Pollutants		Factors		hp		Hours		lb/g		lbs/yr		TPY
NOx	=	(6.9000 g/hp-hr)*		(208 hp)*		(52.0 hrs/yr)*		(0.00220 lbs/g)	=	164.53 lbs/yr	=	0.082 TPY
CO	=	(2.7500 g/hp-hr)*		(208 hp)*		(52.0 hrs/yr)*		(0.00220 lbs/g)	=	65.57 lbs/yr	=	0.033 TPY
POC	=	(1.5000 g/hp-hr)*		(208 hp)*		(52.0 hrs/yr)*		(0.00220 lbs/g)	=	35.77 lbs/yr	=	0.018 TPY
PM_{10}	=	(0.2500 g/hp-hr)*		(208 hp)*		(52.0 hrs/yr)*		(0.00220 lbs/g)	=	5.96 lbs/yr	=	0.003 TPY
SO_2	=	(0.0055 g/hp-hr)*		(208 hp)*		(52.0 hrs/yr)*		(0.00220 lbs/g)	=	0.13 lbs/yr	=	0.000 TPY

Pollutants		Factors		hp		hr/day		lb/g		lbs/day
NOx	=	(6.9000 g/hp-hr)*		(208 hp)*		(24 hr/day)*		(0.00220 lbs/g)	=	75.937 lbs/day
CO	=	(2.7500 g/hp-hr)*		(208 hp)*		(24 hr/day)*		(0.00220 lbs/g)	=	30.265 lbs/day
POC	=	(1.5000 g/hp-hr)*		(208 hp)*		(24 hr/day)*		(0.00220 lbs/g)	=	16.508 lbs/day
PM_{10}	=	(0.2500 g/hp-hr)*		(208 hp)*		(24 hr/day)*		(0.00220 lbs/g)	=	2.751 lbs/day
SO_2	=	(0.0055 g/hp-hr)*		(208 hp)*		(24 hr/day)*		(0.00220 lbs/g)	=	0.061 lbs/day

Pollutant	Existing	New	Total
NOx	0	0.082	0.082
CO	0	0.0328	0.0328
POC	0	0.0179	0.0179
PM_{10}	0	0.0030	0.0030
SO_2	0	0.0001	0.0001
NPOC	0	0.000	0.000

Kraft Foods Inc.
Plant No. 167, Application No. 23324
BAAQMD August 2012

2010 Actual HAP Emissions for Emergency Standby Diesel Firepump Engine S-99

S-99 has a maximum throughput of 10.4 gallons per hour, gallons per year = 52.0 hours/year x 10.4 gallons/year = 540.8 gallons/year = 0.541 thou gal/year

HAPs Emission Factors from ARB CATEF Database

SOURCEID	SYSTEM	MATERIAL	SCC	TYPE	DESCRIPTION	CAS	SUBSTANCE	MEAN	UNIT	Annual HAP Emissions	
3246	Internal Combustion Engine	Diesel	20200102	None	O2>13%	106-99-0	1,3-Butadiene	5.41E-03	lbs/Mgal	2.93E-03	lb/year
3251	Internal Combustion Engine	Diesel	20200102	None	O2>13%	75-07-0	Acetaldehyde	1.07E-01	lbs/Mgal	5.79E-02	lb/year
3252	Internal Combustion Engine	Diesel	20200102	None	O2>13%	107-02-8	Acrolein	1.30E-02	lbs/Mgal	7.03E-03	lb/year
3256	Internal Combustion Engine	Diesel	20200102	None	O2>13%	71-43-2	Benzene	1.22E-01	lbs/Mgal	6.60E-02	lb/year
3220	Internal Combustion Engine	Diesel	20100102	None	O2>13%	50-32-8	Benzo(a)pyrene	3.35E-03	lbs/Mgal	1.81E-03	lb/year
3222	Internal Combustion Engine	Diesel	20100102	None	O2>13%	205-99-2	Benzo(b)fluoranthene	6.70E-03	lbs/Mgal	3.62E-03	lb/year
3226	Internal Combustion Engine	Diesel	20100102	None	O2>13%	207-08-9	Benzo(k)fluoranthene	6.70E-03	lbs/Mgal	3.62E-03	lb/year
3227	Internal Combustion Engine	Diesel	20100102	None	O2>13%	218-01-9	Chrysene	3.58E-03	lbs/Mgal	1.94E-03	lb/year
3229	Internal Combustion Engine	Diesel	20100102	None	O2>13%	53-70-3	Dibenz(a,h)anthracene	3.49E-03	lbs/Mgal	1.89E-03	lb/year
3235	Internal Combustion Engine	Diesel	20100102	None	O2>13%	50-00-0	Formaldehyde	1.11E+00	lbs/Mgal	6.01E-01	lb/year
3238	Internal Combustion Engine	Diesel	20100102	None	O2>13%	193-39-5	Indeno(1,2,3-cd)pyrene	3.46E-03	lbs/Mgal	1.87E-03	lb/year
3240	Internal Combustion Engine	Diesel	20100102	None	O2>13%	91-20-3	Naphthalene	5.64E-02	lbs/Mgal	3.05E-02	lb/year
3286	Internal Combustion Engine	Diesel	20200102	None	O2>13%	108-88-3	Toluene	5.50E-02	lbs/Mgal	2.98E-02	lb/year
3289	Internal Combustion Engine	Diesel	20200102	None	O2>13%	1330-20-7	Xylene (Total)	3.59E-02	lbs/Mgal	1.94E-02	lb/year

Kraft Foods Inc.
Plant No. 167, Application No. 23324
BAAQMD August 2012

2010 Actual HAP Emissions for S-32001 Boiler 3.5 MMBtu/hour Natural Gas Fired, 0 MMBtu/year for 2010

	ppm@3%O2	lb/MMBtu	MMBtu/year	lb/year	tons/year
NOx	80.8	0.098	0	0.00E+00	0.00E+00
CO	111	0.082	0	0.00E+00	0.00E+00
VOC		0.0054	0	0.00E+00	0.00E+00
PM10		0.00745	0	0.00E+00	0.00E+00
SO2		0.0028	0	0.00E+00	0.00E+00

Emission Factors for Small Boilers from Table 1.4-1, Table 1.4-2 AP-42 7/98

	lb/MMBtu	MMBtu/year	lb/year	Acute Trigger lb/hour	Chronic Trigger lb/year
Benzene Note 1	2.06E-06	0	0.00E+00	2.90E+00	3.80E+00
Formaldehyde Note 1	7.35E-05	0	0.00E+00	1.20E-01	1.80E+01
Toluene Note 1	3.33E-06	0	0.00E+00	8.20E+01	1.20E+04
Acetaldehyde Note 2	8.45E-06	0	0.00E+00	1.00E+00	3.80E+01

Note 1 TAC Emission Factors from Miscellaneous Natural Gas Sources Policy Approved 2/28/08
Note 2 Emission Factor from CATEF Database for Natural Gas Fired Boilers (Mean Value 8.87E-03 lbs/MMcf)

Kraft Foods Inc.
Plant No. 167, Application No. 23324
BAAQMD August 2012

HAP Emissions for A-104 Recuperative Thermal Oxidizer, 3.5 MMBtu/hour Natural Gas Fired at Maximum Fuel Usage Rate, 1432.3 MMBtu/year for 2010

	ppm@3%O2	lb/MMBtu	MMBtu/year	lb/year	tons/year
NOx	80.8	0.098	1432.3	1.40E+02	7.02E-02
CO	111	0.082	1432.3	1.17E+02	5.87E-02
VOC		0.0054	1432.3	7.73E+00	3.87E-03
PM10		0.00745	1432.3	1.07E+01	5.34E-03
SO2		0.0028	1432.3	4.01E+00	2.01E-03

Emission Factors for Small Boilers from Table 1.4-1, Table 1.4-2 AP-42 7/98

	lb/MMBtu	MMBtu/hr	lb/year	Acute Trigger lb/hour	Chronic Trigger lb/year
Benzene Note 1	2.06E-06	1432.3	2.95E-03	2.90E+00	3.80E+00
Formaldehyde Note 1	7.35E-05	1432.3	1.05E-01	1.20E-01	1.80E+01
Toluene Note 1	3.33E-06	1432.3	4.77E-03	8.20E+01	1.20E+04
Acetaldehyde Note 2	8.45E-06	1432.3	1.21E-02	1.00E+00	3.80E+01

Note 1 TAC Emission Factors from Miscellaneous Natural Gas Sources Policy Approved 2/28/08
Note 2 Emission Factor from CATEF Database for Natural Gas Fired Boilers (Mean Value 8.87E-03 lbs/MMcf)