Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

AP42 Section: 2.3

Background Chapter 4

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Medical Waste Incineration Emission Test Report

Lenoir Memorial Hospital
Kinston, North Carolina

Office of Air Quality
Clean Air
OAQPS
Planning and Standards

TABLE 2-6. CDD/CDF STACK GAS CONCENTRATIONS AND EMISSIONS RATES AT CONDITION 1

	CONCENTRATION a (ng/dscm, as measured)				EMISSIONS (μg/hr)			
CONGENER	RUN 1	RUN 2	RUN 3	AVERAGE	RUN 1	RUN 2	RUN 3	AVERAGE
DIOXINS								
2378 TCDD	0.79	3.76	2.64	2.40	1.60	8.19	5.53	5.11
Other TCDD	9.7	42.5	26.6	26.3	19.7	92.5	55.8	56.0
12378 PCDD	6.04	28.0	11.8	15.3	12.3	60.8	24.8	32.6
Other PCDD	30.8	106.3	55.5	64.2	62.8	231.2	116	136.7
123478 HxCDD	13.3	34.3	16.1	21.3	27.2	74.7	33.7	45.2
123678 HxCDD	9.64	33.6	19.4	20.9	19.7	73.0	40.6	44.4
123789 HxCDD	18.6	78.1	42.5	46.4	37.9	169.8	88.9	98.9
Other HxCDD	56.1	205.0	122.4	128	114.5	445.8	256	272.3
1234678-HpCDD	85.0	228.1	168.3	160	173.3	496.2	353	340.7
Other Hepta-CDD	73.9	211.9	150.1	145	150.7	460.8	315	308.7
Octa-CDD	212.5	345.9	282.2	280	433.4	752.3	591	592.3
TOTAL CDD	516	1,317	897	910	1,053	2,865	1,880	1,933
FURANS								
2378 TCDF	4.39	20.1	11.9	12.1	8.94	43.7	24.9	25.9
Other TCDF	166	687	436	430	339	1494	913	916
12378 PCDF	18.0	66.9	39.3	41.4	36.8	145.5	82.4	88.2
23478 PCDF	31.1	104.5	60.8	65.5	63.5	227.3	127	139.4
Other PCDF	316.3	1,080	537	644	645.0	2,349	1,124	1,373
123478 HxCDF	116.4	343.3	228	229	237.4	746.8	478	487.3
123678 HxCDF	57.9	205.7	122	129	118.1	447.5	256	273.9
234678 HxCDF	72.0	205.5	181	153	146.9	446.9	379	324.3
123789 HxCDF	3.3	14.4	10.2	9.3	6.8	31.3	21.3	19.8
Other HxCDF	337.8	1,027	691	685	688.8	2,233	1,447	1,456
1234678-HpCDF	265.8	653.6	533	484	542.1	1,422	1,117	1,027
1234789-HpCDF	38.2	88.0	102	76.1	77.8	191.4	214	161.0
Other Hepta-CDF	183.3	410.5	452	349	373.8	892.8	947	737.8
Octa-CDF	201.4	253.3	525	327	410.7	550.9	1,101	687.5
TOTAL CDF	1,810	5,160	3,930	3,630	3,700	11,200	8,230	7,720
TOTAL CDD+CDF	2,330	6,480	4,830	4,540	4,750	14,100	10,110	9,650

a ng/dscm = nanogram per dry standard cubic meter. Standard conditions are defined as 1 atm and 68° F.

TABLE 2-7. CDD/CDF STACK GAS CONCENTRATIONS AND EMISSIONS RATES AT CONDITION 2

CONGENER	CONCENTRATION a (ng/dscm, as measured)				EMISSIONS (μg/hr)			
	RUN 4	RUN 5R	RUN 6	AVERAGE	RUN 4	RUN 5R	RUN 6	AVERAGE
DIOXINS								
2378 TCDD	(1.331)	0.84	1.42	1.20	(2.783)	1.72	2.92	2.48
Other TCDD	12.7	7.98	17.8	12.8	26.5	16.3	36.6	26.5
12378 PCDD	7.83	7.40	10.7	8.64	16.4	15.2	22.0	17.8
Other PCDD	45.0	42.2	55.8	47.7	94.1	86.5	114.7	98.4
123478 HxCDD	12.8	23.5	22.0	19.4	26.7	48.1	45.1	40.0
123678 HxCDD	15.2	21.3	18.3	18.2	31.8	43.6	37.5	37.6
123789 HxCDD	26.1	37.1	39.2	34.1	54.5	75.9	80.5	70.3
Other HxCDD	95.4	132.7	115.9	115	199.4	271.9	238.0	236
1234678-HpCDD	167.3	345.0	166.2	226	349.8	707.0	341.1	466
Other Hepta-CDD	150.2	353.4	112.3	205	314.0	724.2	230.6	423
Octa-CDD	355.5	1160.3	306.9	608	743.4	2377.5	630.2	1,250
TOTAL CDD	889	2,132	867	1,296	1,859	4,368	1,779	2,669
FURANS								
2378 TCDF	5.32	4.05	8.50	5.96	11.1	8.29	17.5	12.3
Other TCDF	177	235	230	214	370	481	473	442
12378 PCDF	20.2	21.0	33.8	25.0	42.1	43.0	69.4	51.5
23478 PCDF	39.9	55.3	63.8	53.0	83.5	113.4	131.1	109
Other PCDF	343.0	645.0	583.1	524	717.1	1,322	1,197	1,079
123478 HxCDF	122.4	289.3	164.6	192	256.0	592.8	338.0	396
123678 HxCDF	66.5	112.2	86.2	88.3	139.1	229.9	176.9	182
234678 HxCDF	129.3	299.6	135.8	188	270.3	613.9	278.8	388
123789 HxCDF	5.51	5.76	7.00	6.09	11.5	11.8	14.4	12.6
Other HxCDF	394.9	743.5	552.6	564	825.7	1,523	1,135	1,161
1234678-HpCDF	344.5	805.3	415.4	522	720.3	1,650	852.9	1,074
1234789-HpCDF	73.8	114.1	83.8	90.6	154.2	233.8	172.2	187
Other Hepta-CDF	308.0	656.9	385.4	450	644.0	1,346	791.3	927
Octa-CDF	380.2	1,958	442.3	927	795.1	4012.0	908.1	1,905
TOTAL CDF	2,410	5,950	3,190	3,850	5,040	12,200	6,560	7,930
TOTAL CDD+CDF	3,300	8,080	4,060	5,150	6,900	16,500	8,330	10,590

a ng/dscm = nanogram per dry standard cubic meter. Standard conditions are defined as 1 atm and 68° F.

( ) = estimated maximum possible concentration.

TABLE 2-8. CDD/CDF STACK GAS CONCENTRATIONS AND EMISSIONS RATES AT CONDITION 3

CONGENER	CONCENTRATION a (ng/dscm, as measured)				EMISSIONS (μg/hr)			
	RUN 7	RUN 8	RUN 9	AVERAGE	RUN 7	RUN 8	RUN 9	AVERAGE
DIOXINS								
2378 TCDD	13.9	15.7	19.1	16.2	25.4	29.9	36.8	30.7
Other TCDD	165.5	179.2	254.7	200	302.5	342.1	490.2	378
12378 PCDD	88.0	81.0	97.1	88.7	160.8	154.6	186.8	167
Other PCDD	441.7	311.8	358.4	371	807.3	595.2	689.6	697
123478 HxCDD	99.5	81.9	76.4	86.0	181.9	156.4	147.0	162
123678 HxCDD	109.4	71.0	75.2	85.2	199.9	135.4	144.7	160
123789 HxCDD	230.2	165.3	197.8	198	420.8	315.6	380.6	372
Other HxCDD	722.8	418.7	495.7	546	1,321	799.2	953.7	1,025
1234678-HpCDD	645.0	338.0	335.6	440	1,179	645.2	645.8	823
Other Hepta-CDD	619.4	280.1	281.7	394	1,132	534.8	542.0	736
Octa-CDD	627.9	266.7	218.5	371	1,148	509.2	420.3	692
TOTAL CDD	3,763	2,210	2,410	2,794	6,879	4,218	4,638	5,245
FURANS								
2378 TCDF	74.8	78.6	85.4	79.6	137	150	164	150
Other TCDF	2053	1572	2030	1885	3752	3000	3907	3553
12378 PCDF	229.4	173.6	237.9	214	419.3	331.3	457.8	403
23478 PCDF	359.7	227.8	323.6	304	657.4	434.8	622.7	572
Other PCDF	3,734	2,144	3,409	3,096	6,825	4,093	6,559	5,826
123478 HxCDF	1,290	587.7	806.1	894.62	2,358	1,122	1,551	1,677
123678 HxCDF	786.0	380.6	512.4	559.69	1436.6	726.6	986.0	1049.7
234678 HxCDF	717.6	347.1	455.5	506.76	1311.7	662.6	876.4	950
123789 HxCDF	(69.63)	(42.63)	(56.94)	(56.39)	(127.3)	(81.4)	(109.5)	(106.0)
Other HxCDF	4,028	1,888	2,520	2,812	7,363	3,604	4,849	5,272
1234678-HpCDF	5,186	1,526	2,212	2,974	9,479	2,912	4,255	5,549
1234789-HpCDF	811.6	221.1	308.7	447	1,483	422.0	593.9	833
Other Hepta-CDF	3,695	969.5	1,343	2,002	6,754	1,851	2,583	3,729
Octa-CDF	982.5	158.0	238.8	460	1,796	301.7	459.6	852
TOTAL CDF	24,000	10,300	14,500	16,300	43,900	19,700	28,000	30,500
TOTAL CDD+CDF	27,800	12,500	16,900	19,100	50,800	23,900	32,600	35,800

a ng/dscm = nanogram per dry standard cubic meter. Standard conditions are defined as 1 atm and 68° F.

( ) = estimated maximum possible concentration.

TABLE 2-16. QUALITATIVE PCB FLUE GAS RESULTS
CDD/CDF RUN 7
LENOIR MEMORIAL HOSPITAL (1990)

ISOMER	COMPOUND DETECTED (Yes/No)
TOTAL MONO PCB	No
TOTAL DI PCB	No
TOTAL TRI PCB	NA
TOTAL TETRA PCB	No
TOTAL PENTA PCB	No
TOTAL HEXA PCB	Yes
TOTAL HEPTA PCB	Yes
TOTAL OCTA PCB	Yes
TOTAL NONA PCB	Yes
DECA PCB	NA

NA = Results not confirmed

TABLE 2-18. METALS/STACK GAS CONCENTRATIONS AND EMISSION RATES FOR CONDITION 1; LENOIR MEMORIAL HOSPITAL (1990)

Date		05/30/90	05/31/90	06/01/90	
Time		14:56-20:22	12:47-17:11	10:19-14:40	
Run No.		1	2	3	
O2 Concentration (%V)		10.9	10.1	14.3	
Flow Rate (dscmm)		32.99	32.69	34.49	AVERAGE
Antimony	(ug/dscm)	381.97	547.50	330.83	420
	(ug/dscm @7% O2)	532.54	704.66	699.94	646
	(g/hr)	0.76	1.07	0.68	0.838
Arsenic	(ug/dscm)	4.35	9.05	5.82	6.40
	(ug/dscm @7% O2)	6.06	11.65	12.30	10.0
	(g/hr)	0.01	0.02	0.01	0.013
Barium	(ug/dscm)	45.55	93.70	57.94	65.7
	(ug/dscm @7% O2)	63.50	120.60	122.58	102
	(g/hr)	0.09	0.18	0.12	0.131
Beryllium	(ug/dscm)	[0.059]	[0.089]	[0.087]	[0.078]
	(ug/dscm @7% O2)	[0.082]	[0.115]	[0.184]	[0.127]
	(g/hr)	[0.0001]	[0.0002]	[0.0002]	[0.0002]
Cadmium	(ug/dscm)	78.95	304.35	66.32	150
	(ug/dscm @7% O2)	110.07	391.71	140.32	214
	(g/hr)	0.16	0.60	0.14	0.297
Chromium	(ug/dscm)	17.79	11.47	17.05	15.4
	(ug/dscm @7% O2)	24.80	14.77	36.08	25.2
	(g/hr)	0.04	0.02	0.04	0.031
Lead	(ug/dscm)	943.80	1441.43	1152.78	1,180
	(ug/dscm @7% O2)	1315.83	1855.17	2438.92	1,870
	(g/hr)	1.87	2.83	2.39	2.36
Mercury	(ug/dscm)	109.21	96.70	66.01	90.6
	(ug/dscm @7% O2)	152.26	124.46	139.65	139
	(g/hr)	0.22	0.19	0.14	0.181
Nickel	(ug/dscm)	17.78	9.46	9.47	12.2
	(ug/dscm @7% O2)	24.78	12.18	20.05	19.0
	(g/hr)	0.035	0.019	0.020	0.024
Silver	(ug/dscm)	[0.980]	[1.449]	[1.421]	[1.283]
	(ug/dscm @7% O2)	[1.366]	[1.865]	[3.006]	[2.079]
	(g/hr)	[0.002]	[0.003]	[0.003]	[0.003]
Thallium	(ug/dscm)	[1.624]	[2.335]	[2.290]	[2.083]
	(ug/dscm @7% O2)	[2.264]	[3.005]	[4.845]	[3.371]
	(g/hr)	[0.003]	[0.005]	[0.005]	[0.004]

Note: Values enclosed in brackets represent the mininum detection limit for elements not detected in the samples. Detection limits are not included in the averages unless otherwise indicated.

TABLE 2-19. METALS/STACK GAS CONCENTRATIONS AND EMISSION RATES FOR CONDITION 2; LENOIR MEMORIAL HOSPITAL (1990)

Date		06/04/90	06/06/90	06/05/90	
Time		15:43-19:47	16:57-21:07	11:21-15:32	
Run Number		4R	5R	6	
O2 Concentration (%V)		14.1	13.9	12.0	
Flow Rate (dscmm)		32.20	33.33	31.21	AVERAGE
Antimony	(µg/dscm)	254.54	517.11	155.76	309
	(µg/dscm @7% O2)	521.08	1032.73	242.72	599
	(g/hr)	0.49	1.03	0.29	0.606
Arsenic	(µg/dscm)	5.96	6.34	4.04	5.45
	(µg/dscm @7% O2)	12.21	12.67	6.29	10.4
	(g/hr)	0.01	0.01	0.01	0.011
Barium	(µg/dscm)	87.27	58.04	92.59	79.3
	(µg/dscm @7% O2)	178.65	115.91	144.28	146
	(g/hr)	0.17	0.12	0.17	0.153
Beryllium	(µg/dscm)	[0.064]	[0.058]	[0.061]	[0.061]
	(µg/dscm @7% O2)	[0.131]	[0.116]	[0.095]	[0.114]
	(g/hr)	[0.0001]	[0.0001]	[0.0001]	[0.0001]
Cadmium	(µg/dscm)	79.83	300.60	110.82	164
	(µg/dscm @7% O2)	163.41	600.33	172.69	312
	(g/hr)	0.15	0.60	0.21	0.321
Chromium	(µg/dscm)	25.81	12.74	15.64	18.1
	(µg/dscm @7% O2)	52.83	25.44	24.38	34.2
	(g/hr)	0.05	0.03	0.03	0.035
Lead	(µg/dscm)	3425.40	1029.21	994.15	1,820
	(µg/dscm @7% O2)	7012.24	2055.46	1549.18	3,540
	(g/hr)	6.62	2.06	1.86	3.51
Mercury	(µg/dscm)	101.98	137.47	48.54	96.0
	(µg/dscm @7% O2)	208.77	274.54	75.64	186
	(g/hr)	0.20	0.27	0.09	0.188
Nickel	(µg/dscm)	15.33	4.73	8.29	9.45
	(µg/dscm @7% O2)	31.38	9.44	12.92	17.9
	(g/hr)	0.03	0.01	0.02	0.018
Silver	(µg/dscm)	12.42	11.49	[1.023]	12.0
	(µg/dscm @7% O2)	25.43	22.94	[1.594]	24.2
	(g/hr)	0.02	0.02	[0.002]	0.023
Thallium	(µg/dscm)	[1.684]	[1.613]	[1.696]	[1.664]
	(µg/dscm @7% O2)	[3.447]	[3.221]	[2.643]	[3.104]
	(g/hr)	[0.003]	[0.003]	[0.003]	[0.003]

Note: Values enclosed in brackets represent the minimum detection limits for elements not detected in the samples. Detection limits are not included in the averages unless otherwise indicated.

TABLE 2-20. METALS/STACK GAS CONCENTRATIONS AND EMISSION RATES FOR CONDITION 3; LENOIR MEMORIAL HOSPITAL (1990)

Date		06/06/90	06/07/90	06/08/90	
Time		10:14-14:33	12:55-17:04	11:20-15:27	
Run Number		7	8	9	
O2 Concentration (%V)		13.0	14.6	13.1	
Flow Rate (dscmm)		30.33	31.63	30.80	AVERAGE
Antimony	(μg/dscm)	796.64	854.78	1524.01	1,060
	(μg/dscm @7% O2)	1392.86	1894.97	2719.35	2,000
	(g/hr)	1.45	1.62	2.82	1.96
Arsenic	(μg/dscm)	11.69	9.33	8.71	9.91
	(μg/dscm @7% O2)	20.45	20.68	15.53	18.89
	(g/hr)	0.02	0.02	0.02	0.018
Barium	(μg/dscm)	60.50	85.81	126.13	90.8
	(μg/dscm @7% O2)	105.77	190.24	225.05	174
	(g/hr)	0.11	0.16	0.23	0.169
Beryllium	(μg/dscm)	[0.063]	[0.065]	[0.066]	[0.065]
	(μg/dscm @7% O2)	[0.110]	[0.144]	[0.118]	[0.124]
	(g/hr)	[0.0001]	[0.0001]	[0.0001]	[0.0001]
Cadmium	(μg/dscm)	246.02	215.76	113.03	192
	(μg/dscm @7% O2)	430.15	478.32	201.69	370
	(g/hr)	0.45	0.41	0.21	0.355
Chromium	(μg/dscm)	19.28	14.52	63.40	32.4
	(μg/dscm @7% O2)	33.71	32.19	113.13	59.7
	(g/hr)	0.04	0.03	0.12	0.060
Lead	(μg/dscm)	1991.59	956.58	1354.26	1,430
	(μg/dscm @7% O2)	3482.15	2120.65	2416.46	2,670
	(g/hr)	3.62	1.82	2.50	2.65
Mercury	(μg/dscm)	3389.31	38.52	96.63	1,170
	(μg/dscm @7% O2)	5925.96	85.39	172.42	2,060
	(g/hr)	6.17	0.07	0.18	2.14
Nickel	(μg/dscm)	15.47	9.89	60.84	28.7
	(μg/dscm @7% O2)	27.05	21.92	108.56	52.5
	(g/hr)	0.03	0.02	0.11	0.053
Silver	(μg/dscm)	3.03	[1.063]	10.11	6.57
	(μg/dscm @7% O2)	5.30	[2.357]	18.04	11.7
	(g/hr)	0.01	[0.002]	0.02	0.012
Thallium	(μg/dscm)	[1.742]	[1.741]	[1.730]	[1.738]
	(μg/dscm @7% O2)	[3.046]	[3.860]	[3.087]	[3.331]
	(g/hr)	[0.003]	[0.003]	[0.003]	[0.003]

Note: Values enclosed in brackets represent the minimum detection limits for elements not detected in the samples. Detection limits are not included in the averages unless otherwise indicated.

TABLE 2-23. METALS AND PM EMISSIONS SAMPLING AND FLUE GAS PARAMETERS
LENOIR MEMORIAL HOSPITAL (1990)

	TEST CONDITION 1			
Run Number Date	1 05/30/90	2 05/31/90	3 06/01/90	Average
Total Sampling Time (min.)	240	240	240	240
Average Sampling Rate (dscfm)	0.526	0.366	0.373	0.422
Metered Volume (dscm)	3.572	2.484	2.533	2.863
Average Stack Temperature (°F)	1,289	1,341	1,341	1,324
O2 Concentration (%V)	10.9	10.1	14.3	11.8
CO2 Concentration (%V)	6.9	7.2	4.5	6.2
Stack Gas Moisture (%V)	12.2	12.7	13.2	12.7
Volumetric Flow Rate (acfm)	4,421	4,498	4,811	4,577
Volumetric Flow Rate (dscfm)	1,165	1,154	1,218	1,179
Volumetric Flow Rate (dscmm)	32.99	32.69	34.49	33.39
Percent Isokinetic	99.3	103	99.9	100.7
	TEST CONDITION 2			
Run Number Date	4R 06/04/90	5R 06/06/90	6 06/05/90	Average
Total Sampling Time (min.)	240	240	240	240
Average Sampling Rate (dscfm)	0.507	0.529	0.503	0.513
Metered Volume (dscm)	3.445	3.595	3.420	3.487
Average Stack Temperature (°F)	1,282	1,312	1,254	1,283
O2 Concentration (%V)	14.1	13.9	12.0	13.3
CO2 Concentration (%V)	4.6	4.9	6.0	5.2
Stack Gas Moisture (%V)	11.6	11.8	10.9	11.4
Volumetric Flow Rate (acfm)	4,277	4,460	4,017	4,251
Volumetric Flow Rate (dscfm)	1,137	1,177	1,102	1,139
Volumetric Flow Rate (dscmm)	32.20	33.33	31.21	32.25
Percent Isokinetic	98.1	98.9	100	99.0
	TEST CONDITION 3			
Run Number Date	7 06/06/90	8 06/07/90	9 06/08/90	Average
Total Sampling Time (min.)	240	240	240	240
Average Sampling Rate (dscfm)	0.490	0.498	0.493	0.494
Metered Volume (dscm)	3.329	3.388	3.353	3.357
Average Stack Temperature (°F)	1,312	1,268	1,289	1,289
O2 Concentration (%V)	13.0	14.6	13.1	13.6
CO2 Concentration (%V)	5.9	4.6	5.9	5.5
Stack Gas Moisture (%V)	12.6	13.0	13.1	12.9
Volumetric Flow Rate (acfm)	4,092	4,198	4,138	4,143
Volumetric Flow Rate (dscfm)	1,071	1,117	1,087	1,092
Volumetric Flow Rate (dscmm)	30.33	31.63	30.80	30.92
Percent Isokinetic	98.1	98.9	100	99.0

TABLE 2-25. PARTICULATE MATTER CONCENTRATIONS AND EMISSIONS RESULTS
LENOIR MEMORIAL HOSPITAL (1990)

DATE	SAMPLING CONDITION	RUN NUMBER	TIME	FLUE GAS CONCENTRATION				FLUE GAS EMISSION RATE	
				(grains/dscf)	(grains/dscf) @7%O2)	(grams/dscm)	(grams/dscm) @7%O2)	(lb/hr)	(kg/hr)
5/30/90	1	1	14:56-20:22	0.068	0.095	0.156	0.218	0.681	0.309
5/31/90	1	2	12:47-17:11	0.131	0.169	0.300	0.386	1.298	0.589
6/1/90	1	3	10:19-14:40	0.086	0.182	0.197	0.417	0.900	0.408
		AVERAGES:		0.095	0.149	0.218	0.340	0.960	0.435
6/4/90	2	4R	15:47-19:47	0.082	0.168	0.188	0.385	0.802	0.364
6/6/90	2	5R	16:57-21:07	0.071	0.142	0.163	0.326	0.719	0.326
6/5/90	2	6	11:21-15:32	0.066	0.103	0.152	0.237	0.627	0.284
		AVERAGES:		0.073	0.138	0.168	0.316	0.716	0.325
6/6/90	3	7	10:14-14:33	0.252	0.441	0.577	1.010	2.317	1.051
6/7/90	3	8	12:55-17:04	0.218	0.483	0.499	1.106	2.087	0.947
6/9/90	3	9	11:20-15:27	0.242	0.432	0.553	0.988	2.246	1.023
		AVERAGES:		0.237	0.452	0.543	1.034	2.217	1.007

TABLE 2-28. SUMMARY OF HCl RESULTS FOR EACH TEST RUN
LENOIR MEMORIAL HOSPITAL (1990)

TEST RUN NUMBER	MEASURED CONCENTRATIONS (mg/dscm)	(mg/dscm @7% O2)	(ppmv)	(ppmv @7% O2)	EMISSION RATE (g/hr)
RUN 1A	989	1280	652	844	1987
RUN 1B	1350	1820	892	1290	2716
RUN 1C	1090	1640	716	1080	2181
AVERAGE	1140	1580	753	1040	2295
RUN 2A	610	793	402	523	1261
RUN 2B	1130	1290	746	853	2339
RUN 2C	1360	1850	893	1220	2802
AVERAGE	1030	1310	680	866	2134
RUN 3A	1180	2750	776	1810	2450
RUN 3B	2130	6000	1410	3960	4439
RUN 3C	1160	2050	762	1350	2406
AVERAGE	1490	3600	982	2370	3099
RUN 4A	892	1290	588	853	1864
RUN 4B	1010	1460	663	965	2103
RUN 4C	1080	1630	710	1080	2250
AVERAGE	991	1460	654	964	2072
RUN 5RA	1170	2240	770	1480	2363
RUN 5RB	906	1770	598	1170	1835
RUN 5RC	NA	NA	NA	NA	NA
AVERAGE	1040	2010	684	1320	2099
RUN 6A	1110	1950	732	1290	2180
RUN 6B	878	1320	579	871	1724
RUN 6C	978	1360	645	896	1919
AVERAGE	989	1540	652	1020	1941
RUN 7A	1340	2175	885	1440	2446
RUN 7B	1770	3391	1170	2240	3226
RUN 7C	1190	2343	783	1550	2164
AVERAGE	1430	2636	945	1740	2612
RUN 8A	1690	4392	1110	2900	3211
RUN 8B	1290	2878	849	1900	2451
RUN 8C	1650	3224	1040	2130	3138
AVERAGE	1540	3498	1020	2310	2934
RUN 9A	1270	2160	836	1430	2391
RUN 9B	882	1419	582	936	1664
RUN 9C	1570	3022	1040	1990	2969
AVERAGE	1240	2200	819	1450	2341

NA = Not Analyzed; Run 5RC was not analyzed due to strong organics.

TABLE 2-29. SUMMARY OF HF RESULTS FOR EACH TEST RUN
LENOIR MEMORIAL HOSPITAL (1990)

TEST RUN NUMBER	MEASURED CONCENTRATIONS (mg/dscm)	(mg/dscm @7% O2)	(ppmv)	(ppmv @7% O2)	EMISSION RATE (g/hr)
RUN 1A	1.72	2.22	2.06	2.67	3.45
RUN 1B	(0.916)	(1.23)	(1.10)	(1.48)	(1.841)
RUN 1C	2.12	3.19	2.55	3.83	4.26
AVERAGE	1.58	2.21	1.90	2.66	3.18
RUN 2A	1.80	2.34	2.16	2.82	3.72
RUN 2B	13.3	15.2	16.0	18.3	27.5
RUN 2C	3.04	4.15	3.65	4.99	6.28
AVERAGE	6.04	7.23	7.26	8.69	12.50
RUN 3A	6.19	14.5	7.44	17.4	12.90
RUN 3B	6.39	18.0	7.68	21.6	13.31
RUN 3C	3.77	6.68	4.54	8.04	7.86
AVERAGE	5.45	13.0	6.55	15.7	11.35
RUN 4A	1.64	2.38	1.97	2.86	3.43
RUN 4B	(1.47)	(2.14)	(1.77)	(2.57)	(3.076)
RUN 4C	13.5	20.5	16.3	24.6	28.3
AVERAGE	5.55	8.34	6.67	10.0	11.60
RUN 5RA	4.37	8.38	5.25	10.1	8.84
RUN 5RB	2.02	3.94	2.42	4.73	4.08
RUN 5RC	NA	NA	NA	NA	NA
AVERAGE	3.19	6.16	3.84	7.41	6.46
RUN 6A	(0.910)	(1.60)	(1.09)	(1.92)	(1.786)
RUN 6B	3.21	4.82	3.86	5.80	6.29
RUN 6C	3.23	4.49	3.88	5.39	6.34
AVERAGE	2.45	3.64	2.94	4.37	4.81
RUN 7A	9.52	15.4	11.4	18.6	17.36
RUN 7B	9.18	17.6	11.0	21.2	16.75
RUN 7C	4.46	8.80	5.36	10.6	8.13
AVERAGE	7.72	13.9	9.28	16.8	14.08
RUN 8A	2.33	6.06	2.80	7.28	4.43
RUN 8B	2.30	5.14	2.76	6.17	4.37
RUN 8C	(2.06)	(4.03)	(2.48)	(4.84)	(3.921)
AVERAGE	2.23	5.07	2.68	6.10	4.24
RUN 9A	9.52	16.2	11.4	19.5	17.95
RUN 9B	8.98	14.4	10.8	17.4	16.94
RUN 9C	5.26	10.1	6.32	12.1	9.91
AVERAGE	7.92	13.6	9.52	16.3	14.93

NA = Not Analyzed; Run 5RC was not analyzed due to strong organics.

( ) = maximum estimated concentration

TABLE 2-30. SUMMARY OF HBr RESULTS AT EACH TEST RUN
LENOIR MEMORIAL HOSPITAL (1990)

TEST RUN NUMBER	MEASURED CONCENTRATIONS (mg/dscm)	(mg/dscm @7% O2)	(ppmv)	(ppmv @7% O2)	EMISSION RATE (g/hr)
RUN 1A	[0.064]	[0.083]	[0.019]	[0.025]	[0.129]
RUN 1B	[0.089]	[0.120]	[0.026]	[0.035]	[0.179]
RUN 1C	[0.066]	[0.099]	[0.020]	[0.030]	[0.133]
AVERAGE	[0.073]	[0.101]	[0.022]	[0.030]	[0.147]
RUN 2A	[0.060]	[0.078]	[0.018]	[0.023]	[0.124]
RUN 2B	[0.095]	[0.109]	[0.028]	[0.032]	[0.196]
RUN 2C	[0.073]	[0.100]	[0.022]	[0.030]	[0.151]
AVERAGE	[0.076]	[0.096]	[0.023]	[0.028]	[0.157]
RUN 3A	[0.101]	[0.236]	[0.030]	[0.070]	[0.210]
RUN 3B	[0.101]	[0.284]	[0.030]	[0.084]	[0.210]
RUN 3C	[0.104]	[0.184]	[0.031]	[0.055]	[0.217]
AVERAGE	[0.102]	[0.235]	[0.030]	[0.070]	[0.212]
RUN 4A	[0.075]	[0.109]	[0.022]	[0.032]	[0.157]
RUN 4B	[0.091]	[0.132]	[0.027]	[0.039]	[0.190]
RUN 4C	[0.084]	[0.127]	[0.025]	[0.038]	[0.176]
AVERAGE	[0.083]	[0.123]	[0.025]	[0.036]	[0.174]
RUN 5RA	[0.077]	[0.148]	[0.023]	[0.044]	[0.156]
RUN 5RB	[0.068]	[0.133]	[0.020]	[0.039]	[0.138]
RUN 5RC	NA	NA	NA	NA	NA
AVERAGE	[0.073]	[0.141]	[0.022]	[0.042]	[0.147]
RUN 6A	0.590	1.036	0.175	0.308	1.157
RUN 6B	0.231	0.348	0.069	0.103	0.454
RUN 6C	[0.076]	[0.106]	[0.023]	[0.032]	[0.149]
AVERAGE	0.411	0.692	0.122	0.206	0.806
RUN 7A	2.57	4.17	0.763	1.24	4.68
RUN 7B	[0.056]	[0.107]	[0.017]	[0.033]	[0.102]
RUN 7C	[0.102]	[0.201]	[0.030]	[0.059]	[0.186]
AVERAGE	2.57	4.17	0.763	1.24	4.68
RUN 8A	1.52	3.96	0.452	1.18	2.90
RUN 8B	0.615	1.37	0.183	0.408	1.17
RUN 8C	[0.129]	[0.252]	[0.038]	[0.074]	[0.246]
AVERAGE	1.07	2.67	0.317	0.793	2.03
RUN 9A	2.10	3.58	0.624	1.06	3.96
RUN 9B	1.87	3.01	0.556	0.89	3.53
RUN 9C	1.87	3.58	0.555	1.07	3.52
AVERAGE	1.95	3.39	0.578	1.01	3.67

NA = Not Analyzed; Run 5RC was not analyzed due to strong organics
[ ] = minimum detection limit

TABLE 2-32. CONTINUOUS EMISSIONS MONITORING DAILY TEST AVERAGES FOR O2, CO, CO2, AND HCl
LENOIR MEMORIAL HOSPITAL (1990)

DATE	RUN NUMBER/ MANUAL TEST TYPE	CONDITION	TEST a TIME	MOISTURE	OXYGEN (%V,dry)	CO2 (%V,dry)	CO actual (ppmv,dry)	CO corrected b (ppmv,dry) @7% O2	HCL c actual (ppmv,wet)	HCL c corrected d (ppmv,dry) @7% O2
05/30/90	1	1	14:56-20:22	12.03	10.93	6.91	145.8 (wet) e	167.0 d	25.3	34.8
05/31/90	2	1	12:47-17:11	12.72	10.10	7.20	112.8 (wet) e	149.0 d	208.5	321.0
06/01/90	3	1	10:19-14:40	13.38	14.33	4.49	25.9 (wet) e	63.8 d	129.3	355.0
	AVERAGE:				11.79	6.20	94.8 (wet) e	126.6 d	121.0	236.9
06/02/90	4	2	10:02-14:23	11.74	11.38	6.35	36.0	54.4	33.3	61.7
06/04/90	4R f	2	15:43-19:47	11.61	14.11	4.55	65.5	97.4		
06/06/90	5R	2	16:57-21:07	11.64	13.94	4.89	62.7	105.0	8.8	18.0
06/05/90	6	2	11:21-15:32	11.03	11.98	6.01	48.3	75.0	90.1	116.0
	AVERAGE:				12.43	5.75	49.0	78.1	44.1	65.2
06/06/90	7	3	10:14-14:33	12.67	12.95	5.94	1698.4	2193.0	21.7	44.3
06/07/90	8	3	12:55-17:04	12.99	14.63	4.59	491,0	774.0	92.6	279.0
06/08/90	9	3	11:20-15:27	13.24	13.11	5.86	1330.5	2061.0	140.8	339.0
	AVERAGE:				13.56	5.46	1173.3	1676.0	85.0	220.8

a For metals/CDD/CDF runs.

b 30 second averages were corrected to 7% oxygen (corrected value = actual * (13.9 /(20.9 - O2)).

c HCl concentrations were determined by manual methods as well. A comparison of CEM vs. manual results is presented in Section 2.6.

d 30 second averages were corrected to 7% oxygen and for moisture, where the corrected value = actual * 13.9/(20.9 - O2) * (1/(1 - moist).

e These values were determined using a dilution probe system. Because the CEM concentration trends were extremely noisy with very high, sharp peaks, this system may not have been able to fully resolve CO concentrations and values may biased low.

f Toxic metals Run 4 originally scheduled to be performed on 6/02 was performed on 6/04. CEM values for this run are not included in condition averages.

TABLE 2-33. CONTINUOUS EMISSIONS MONITORING DAILY TEST AVERAGES FOR O2, SO2, NOx AND THC
LENOIR MEMORIAL HOSPITAL (1990)

DATE	RUN NUMBER	CONDITION	TEST TIME a	MOISTURE (%V)	OXYGEN (%V,dry)	SO2 actual (ppmv,dry)	SO2 corrected b (ppmv,dry)	NOx actual (ppmv,dry)	NOx corrected b (ppmv,dry)	THC actual (ppmC,wet)	THC corrected c (ppmC,dry)
05/30/90	1	1	14:56-20:22	12.03	10.93	10.96	12.60	44.6	62.2	7.43	10.90
05/31/90	2	1	12:47-17:11	12.72	10.10	16.09	15.30	66.7	88.0	12.61	19.00
06/01/90	3	1	10:19-14:40	13.38	14.33	3.92	7.83	43.7	94.6	12.02	29.50
	AVERAGE:				11.79	10.32	11.91	51.7	81.6	10.69	19.80
06/02/90	4	2	10:02-14:23	11.74	11.38	5.20	6.71	56.3	85.5	2.43	4.11
06/04/90	4R	2	15:43-19:47	11.61	14.11	7.41	10.99	31.6	70.2	18.47	16.60
06/06/90	5R	2	16:57-21:07	11.64	13.94	8.60	12.76	45.8	93.8	e	e
06/05/90	6	2	11:21-15:32	11.03	11.98	4.78	4.59	51.1	84.2	6.66	10.90
	AVERAGE:g				12.43	6.19	8.02	51.0	87.8	4.55	7.51
06/06/90	7	3	10:14-14:33	12.67	12.95	12.37	16.50	56.9	95.8	11.39	17.80
06/07/90	8	3	12:55-17:04	12.99	14.63	6.28	8.61	43.4	95.5	e	e
06/08/90	9	3	11:20-15:27	13.24	13.11	23.14	31.90	56.6	102.0	48.3 f	75.80
	AVERAGE:				13.56	13.93	19.00	52.3	97.8	11.39	46.80

a Time is for metals and CDD/CDF runs.

b SO2 and NOx are corrected to 7% oxygen, where the corrected value = actual * 13.9/(20.9 - O2).

c THC is corrected to 7% oxygen and corrected for moisture where the corrected value = actual * 13.9/(20.9 - O2) * 1/(1 - moist).

d Toxic metals Run 4 originally scheduled to be performed on 6/02 was performed on 6/04. CEM values for this run are not included in condition averages.

e THC analyzer failure

f The total hydrocarbon concentration was recorded on a wet basis for all test days except 6/08 in which the sample stream was conditioned and therefore THC was monitored on a dry basis.

g Averages do not include Run 4R.

TABLE 3-1. OPERATING PARAMETERS FOR EMISSIONS TESTS

	Proposed operating parameters				Revised operating parameters			
Condition	Feed rate, kg/hr (lb/hr)	Charge rate, kg/charge (lb/charge)	Charge cycle, min	Secondary chamber burner setpoint temp., °C (°F)	Feed rate, kg/hr (lb/hr)	Charge rate, kg/charge (lb/charge	Charge cycle, min	Secondary chamber burner setpoint temp., °C (°F)
I	136 (300)	14 (30)	6	1038-1093 (1900-2000)	136 (300)	14 (30)	6	1038 (1900)
II	91 (200)	9.1 (20)	6	1038-1093 (1900-2000)	91 (200)	9.1 (20)	6	1038 (1900)
III	145 (320)	36 (80)	15	870 (1600)	136 (300)	23 (50)	10	870 (1600)
IV	136 (300)	23 (50)	10	1093 (2000)	None			