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.

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ORGANIC EMISSIONS FROM THE EXHAUST STACK OF A MULTIPLE HEARTH FURNACE BURNING SEWAGE SLUDGE

final report

4-5

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TABLE 2-1. MEAN INCINERATOR OPERATING PARAMETERS DURING THE BAGHOUSE TEST RUNS

Parameter	Run 01	Run 02	Run 03	Average
Sludge Feed Rate (kg/hr)				
Wet Cake	1837	1864	1483	1728
Dry Cake	310	300	NA	
Residue at 600°C	93	87	NA	
Sludge Composition (wt. %)				
Moisture	83.1	83.9	NA	
Dry Solids	16.9	16.1	NA	
Volatile Matter	70.0	71.0	NA	
Auxiliary Fuel Usage				
Fuel Gas (cu ft/hr)	100	150	0	83
Fuel Oil (gal/hr)	30	34	29	31

NA: data not available.

TABLE 2-4. MEAN INCINERATOR OPERATING PARAMETERS DURING ESP TESTS

Parameter	Run 1	Run 2	Run 3	Average
Sludge Feed Rate (kg/hr)				
Wet Cake	1,701	1,569	1,569	1,613
Dry Cake	264	243	242	250
Residue at 600°C	82	78	78	79
Sludge Composition (wt. %)				
Moisture	84.5	84.5	84.6	84.5
Volatile Matter	69.0	68.0	68.0	68.3
Dry Solids	15.5	15.5	15.4	15.5
Percent O_2 (Dry Vol. %)	15.1	14.5	14	14.5
Auxiliary Fuels				
Fuel Gas (cu ft/hr)	5,060	3,900	3,400	4,120
Fuel Oil (gal/hr)	11.0	16.0	14.0	13.7

TABLE 2-7. SUMMARY OF VOLATILE ORGANICS RESULTS - BAGHOUSE TESTS[b]

Run	1				2				3			
	Sludge µg/g[a]	Sludge g/h	Scrubber[c] µg/dscm	Scrubber[c] g/h	Sludge µg/g[a]	Sludge g/h	Scrubber[c] µg/dscm	Scrubber[c] g/h	Sludge µg/g[a]	Sludge g/h	Scrubber[c] µg/dscm	Scrubber[c] g/h
Chloroform	0.7	1.3	146.6	2.0	0.9	1.7	178.4	2.4	0.5	0.7	194.9	2.7
1,1,1-Trichloroethane	<0.1	<0.2	11.3	0.2	<0.1	<0.2	14.5	0.2	<0.1	<0.1	15.4	0.2
Trichloroethene	<0.1	<0.2	0.8	0.01	<0.1	<0.2	9.9	0.1	<0.1	<0.1	28.0	0.4
Tetrachloroethene	0.6	1.1	7.0	0.1	0.5	0.9	55.0	0.7	0.3	0.4	70.1	1.0
Toluene	1.6	2.9	315.9	4.3	1.9	3.5	127.3	1.7	1.6	2.4	628.1	8.9
Xylene	1.0	1.8	18.0	0.2	0.1	0.2	4.8	0.06	0.3	0.4	34.3	0.5
Acetone	154	280	105.5	1.4	14.1	26	47.3	0.6	13.0	19	61.0	0.9
Methyl ethyl ketone	40.3	74	93.7	1.3	3.3	6.2	80.2	1.1	<0.1	<0.1	230.1	3.2
Carbon tetrachloride	<0.1	<0.2	<0.6	<0.01	<0.1	<0.2	<0.6	<0.01	<0.1	<0.1	<0.6	<0.01

[a]basis, grams of wet sludge
[b]samples collected 9/27/84-9/29/84
[c]scrubber emissions to atmosphere, diluted with excess shaft cooling air

TABLE 2-8. VOLATILE ORGANICS AT INCINERATOR - ESP TESTS[b]

Run	1				2				3			
	Sludge		Incinerator		Sludge		Incinerator		Sludge		Incinerator	
	µg/g[a]	g/h	µg/dscm	g/h	µg/g	g/h	µg/dscm	g/h	µg/g	g/h	µg/dscm	g/h
Chloromethane	<0.1	<0.2	39.6	0.2	<0.1	<0.2	0.04	0.0002	<0.1	<0.2	ND[c]	ND
Bromomethane	<0.2	<0.3	37.3	0.2	<0.2	<0.3	10.8	<0.06	<0.2	<0.3	<1.9	<0.007
Vinyl Chloride	<0.3	<0.5	38.3	0.2	<0.3	<0.5	100.2	0.6	<0.3	<0.5	2.3	0.0009
Chloroethane	<0.1	<0.2	25.8	0.1	<0.1	<0.2	26.3	0.2	<0.1	<0.2	6.4	0.02
Methylene Chloride	0.032	0.05	<0.1	<0.0006	0.42	0.07	1.2	0.007	0.06	0.09	ND	ND
1,1,-Dichloroethene	<0.02	<0.03	0.8	0.004	<0.02	<0.03	1.0	0.006	<0.02	<0.03	<0.2	<0.0006
trans-1,1-Dichloroethane	0.015	0.03	1.7	0.009	0.015	0.02	8.0	0.05	0.018	0.03	2.5	0.009
Chloroform	<0.02	<0.03	1.2	0.006	<0.02	<0.03	1.8	0.01	<0.02	<0.03	0.5	0.002
1,1,1-Trichloroethane	<0.04	<0.07	1.3	0.007	<0.04	<0.06	6.6	0.04	<0.04	<0.06	14.0	0.05
Trichloroethene	<0.02	<0.03	3.2	0.02	<0.02	<0.03	2.5	0.02	<0.02	<0.03	0.5	0.002
Benzene	0.032	0.05	420.7	2.3	0.043	0.07	308.7	1.9	0.092	0.14	111.5	0.4
Tetrachloroethene	<0.04	<0.07	25.6	0.1	<0.04	<0.06	18.8	0.1	0.082	0.13	6.1	0.02
Toluene	0.042	0.07	359.8	2.0	0.047	0.07	254.2	1.5	0.106	0.17	20.4	0.07
Chlorobenzene	0.053	0.09	86.1	0.5	0.028	0.04	82.8	0.5	0.085	0.13	0.6	0.002
Ethylbenzene	<0.02	<0.03	43.2	0.2	<0.02	<0.03	55.3	0.3	0.037	0.06	2.1	0.008
Xylene, ortho	0.048	0.08	37.3	0.2	0.025	0.04	78.5	0.5	0.082	0.13	3.3	0.01
Xylenes, meta/para	0.041	0.07	32.1	0.2	0.02	0.03	52.1	0.3	0.114	0.18	1.6	0.006
Bromodichloromethane	<0.04	<0.07	<0.2	<0.001	<0.04	<0.06	<0.2	0.001	<0.04	<0.06	<0.3	<0.001
1,1 Dichloroethane	<0.02	<0.03	<0.1	<0.0006	<0.02	<0.03	<0.1	<0.0007	<0.02	<0.03	<0.2	<0.0006

[a]Basis, grams of wet sludge.
[b]Samples collected February 14, 1985 - February 16, 1985.
[c]Not detected.

TABLE 2-9. VOLATILE ORGANICS AT SCRUBBER - ESP TESTS[b]

Run	1				2				3			
	Sludge µg/g[a]	Sludge g/h	Scrubber[c] µg/dscm	Scrubber[c] g/h	Sludge µg/g[a]	Sludge g/h	Scrubber[c] µg/dscm	Scrubber[c] g/h	Sludge µg/g[a]	Sludge g/h	Scrubber[c] µg/dscm	Scrubber[c] g/h
Chloromethane	<0.1	<0.2	164.4	1.8	<0.1	<0.2	25.2	0.3	<0.1	<0.2	219.7	1.8
Bromomethane	<0.2	<0.3	<1.9	<0.02	<0.2	<0.3	<1.3	<0.01	<0.2	<0.3	<1.4	<0.01
Vinyl Chloride	<0.3	<0.5	27.2	0.3	<0.3	<0.5	30.1	0.3	<0.3	<0.5	1.7	0.01
Chloroethane	<0.1	<0.2	15.6	0.2	<0.1	<0.2	22.7	0.2	<0.1	<0.2	25.8	0.2
Methylene Chloride	0.032	0.05	36.0	0.4	0.042	0.07	101.2	1.0	0.06	0.09	29.1	0.2
1,1,-Dichloroethene	<0.02	<0.03	<0.2	<0.002	<0.02	<0.03	11.8	0.1	<0.02	<0.03	9.8	0.08
trans-1,1-Dichloroethane	0.015	0.03	127.4	1.4	0.015	0.02	149.8	1.5	0.018	0.03	122.9	1.0
Chloroform	<0.02	<0.03	96.0	1.0	<0.02	<0.03	119.4	1.2	<0.02	<0.03	106.3	0.9
1,1,1-Trichloroethane	<0.04	<0.07	60.3	0.7	<0.04	<0.06	89.4	0.9	<0.04	<0.06	101.2	0.8
Trichloroethene	<0.02	<0.03	122.6	1.3	<0.02	<0.03	104.8	1.1	<0.02	<0.03	111.5	0.9
Benzene	0.032	0.05	454.2	4.9	0.043	0.07	314.3	3.2	0.092	0.14	305.4	2.5
Tetrachloroethene	<0.04	<0.07	861.7	9.2	<0.04	<0.06	360.5	3.6	0.082	0.13	429.9	3.5
Toluene	0.042	0.07	328.5	3.5	0.047	0.07	391.2	3.9	0.106	0.17	458.1	3.7
Chlorobenzene	0.053	0.09	77.2	0.8	0.028	0.04	79.7	0.8	0.085	0.13	88.9	0.7
Ethylbenzene	<0.02	<0.03	39.4	0.4	<0.02	<0.03	55.5	0.6	0.037	0.06	88.5	0.7
Xylene, ortho	0.048	0.08	35.6	0.4	0.025	0.04	47.6	0.5	0.082	0.30	71.5	0.6
Xylenes, meta/para	0.041	0.07	34.3	0.4	0.020	0.03	47.4	0.5	0.114	0.18	72.1	0.6
Bromodichloromethane	<0.04	<0.07	30.1	0.3	<0.04	<0.06	38.4	0.4	<0.04	<0.06	47.6	0.4
1,1 Dichloroethane	<0.02	<0.03	<0.01	<0.0001	<0.02	<0.03	9.9	0.1	<0.02	<0.03	8.2	0.07

[a]Basis, grams of wet sludge.
[b]Samples collected February 14, 1985 - February 16, 1985.
[c]Scrubber emissions to atmosphere, diluted with excess shaft cooling air.