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:	11.20
Background Chapter	4
Reference:	18
Title:	Emission Test Results for No. 2 and No. 4 Aggregate Kilns, Solite Corporation, Leaksville Plant, Cascade, Virginia, IEA, Research Triangle Park, NC, August 8, 1992.

REF 17 (AP-42)
Ref 4-18

SOLITE CORPORATION, LEAKSVILLE PLANT

D. Emission Data/Mass Flux Rates/Emission Factors Date: 04/20/93

Test ID	Parameter	Units	Values reported Run 1	Run 2	Run 3	Run 4
1	Stack temperature	Deg. F	339.5	340.9	339.6	
Kiln #2	Moisture	%	6.1	6.3	6.9	
	Oxygen	%	17	17.2	17.2	
	Volumetric flow, actual	acfm	52,200	50,800	49,100	
	Volumetric flow, standard	dscfm	32,800	31,000	29,700	
	Isokinetic variation	%	91.2	92.9	92.3	
Circle: Production or feed rate Capacity:		TPH feed	13.7	13.7	13.8	
	Pollutant concentrations:					
	Filterable PM	G/dscf	0.001138	0.001795	0.001493	
	Hydrogen chloride	mg/cu. m	558.9	470.8	515.5	
	Chlorine	mg/cu. m	25.460	3.094	6.042	
	CO2	%	3.9	3.6	3.5	
	Pollutant mass flux rates:					
	Filterable PM	lb/hr	0.320	0.477	0.380	
	Hydrogen chloride	lb/hr	68.7	54.7	57.4	
	Chlorine	lb/hr	3.128	0.359	0.672	
	CO2	lb/hr	8,780	7,660	7,135	
	Emission factors:					Average
	Filterable PM	lb/ton	0.023	0.035	0.028	0.029
	Hydrogen chloride	lb/ton	5.0	4.0	4.2	4.4
	Chlorine	lb/ton	0.23	0.026	0.049	0.10
	CO2	lb/ton	641	559	517	572

Mass flux rates differ from those reported in test report because an average volumetric flow rate was used in the test report calculations.

Test ID	Parameter	Units	Values reported Run 1	Run 2	Run 3	Run 4
2	Stack temperature	Deg. F	346.2	333.5	349.5	
Kiln #4	Moisture	%	9.7	10	9.5	
	Oxygen	%	15.9	15.9	16.2	
	Volumetric flow, actual	acfm	46,300	45,800	47,100	
	Volumetric flow, standard	dscfm	27,100	27,100	27,500	
	Isokinetic variation	%	93.5	94.7	96.8	
Circle: Production or feed rate Capacity:		TPH feed	13.7	13.7	13.8	
	Pollutant concentrations:					
	Filterable PM	G/dscf	0.00245	0.00173	0.00620	
	Hydrogen chloride	mg/cu. m	698.0	723.0	558.9	
	Chlorine	mg/cu. m	27.005	0.191	8.350	
	CO2	%	5.3	5.1	4.6	
	Pollutant mass flux rates:					
	Filterable PM	lb/hr	0.570	0.402	1.462	
	Hydrogen chloride	lb/hr	70.8	73.4	57.6	
	Chlorine	lb/hr	2.74	0.0194	0.860	
	CO2	lb/hr	9,859	9,487	8,683	
	Emission factors:					Average
	Filterable PM	lb/ton	0.042	0.029	0.106	0.059
	Hydrogen chloride	lb/ton	5.2	5.4	4.2	4.9
	Chlorine	lb/ton	0.20	0.0014	0.062	0.088
	CO2	lb/ton	720	692	629	680

Mass flux rates differ from those reported in test report because an average volumetric flow rate was used in the test report calculations.

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
3	Stack temperature	Deg. F	355	349	344.3	
Kiln #2	Moisture	%	5.4	6	6.7	
	Oxygen	%	17	17.1	17.2	
	Volumetric flow, actual	acfm	52,800	54,700	50,900	
	Volumetric flow, standard	dscfm	32,000	33,200	30,700	
	Isokinetic variation	%	100.3	97.5	109.4	
Circle: Production or feed rate Capacity:		TPH feed	13.7	13.7	13.8	13.7
	Pollutant concentrations:					
	Antimony	ug/dscf	0.0266	0.0439	0.0152	
	Arsenic	ug/dscf	0.0552	0.0853	0.0320	
	Barium	ug/dscf	0.391	0.276	0.189	
	Beryllium	ug/dscf	0.0094	0.0158	0.0106	
	Cadmium	ug/dscf	0.137	1.034	3.167	
	Chromium	ug/dscf	0.179	0.227	0.208	
	Hexavalent Chromium	ug/dscf	ND	ND	ND	
	Lead	ug/dscf	1.31	2.30	4.09	
	Mercury	ug/dscf	0.0858	0.142	0.116	
	Silver	ug/dscf	0.0214	0.595	0.0208	
	Thallium	ug/dscf	0.0082835	0.0200	0.00400	
	CO2 (Cr+6 test)	%	3.9	3.4	3.7	
	CO2 (metals)	%	3.8	3.7	3.5	
	CO	ppm	50.92	71.06	57.98	
	Total hydrocarbons	ppm	4.71	5.28	4.65	
	Pollutant mass flux rates:					
	Antimony	lb/hr	0.0001125	0.0001929	6.189E-05	
	Arsenic	lb/hr	0.0002335	0.0003746	0.00013	
	Barium	lb/hr	0.0016554	0.0012114	0.0007674	
	Beryllium	lb/hr	3.98E-05	6.94E-05	4.31E-05	
	Cadmium	lb/hr	0.0005818	0.00454	0.01286	
	Chromium	lb/hr	0.0007594	0.0009962	0.0008456	
	Hexavalent Chromium	lb/hr	ND	ND	ND	
	Lead	lb/hr	0.005562	0.0101	0.0166	
	Mercury	lb/hr	0.000363	0.0006248	0.0004704	
	Silver	lb/hr	9.076E-05	0.00261	8.456E-05	
	Thallium	lb/hr	3.506E-05	8.767E-05	1.624E-05	
	CO2 (Cr+6 test)	lb/hr	8,754	7,701	7,797	
	CO2 (metals)	lb/hr	8,347	8,432	7,375	
	CO	lb/hr	7.09	10.3	7.74	
	Total hydrocarbons	lb/hr	0.376	0.438	0.356	
	Emission factors:					Average
	Antimony	lb/ton	8.21E-06	1.408E-05	4.485E-06	8.92E-06
	Arsenic	lb/ton	1.704E-05	2.734E-05	9.423E-06	1.79E-05
	Barium	lb/ton	0.0001208	8.842E-05	5.561E-05	8.83E-05
	Beryllium	lb/ton	2.905E-06	5.067E-06	3.12E-06	3.7E-06
	Cadmium	lb/ton	4.247E-05	0.0003316	0.000932	0.000435
	Chromium	lb/ton	5.543E-05	7.272E-05	6.127E-05	6.31E-05
	Hexavalent Chromium	lb/ton	ND	ND	ND	ND
	Lead	lb/ton	0.000406	0.0007388	0.0012049	0.000783
	Mercury	lb/ton	2.65E-05	4.561E-05	3.409E-05	3.54E-05
	Silver	lb/ton	6.625E-06	0.0001908	6.127E-06	6.79E-05
	Thallium	lb/ton	2.559E-06	6.399E-06	1.177E-06	3.38E-06
	CO2 (Cr+6 test)	lb/ton	639	562	565	589
	CO2 (metals)	lb/ton	609	615	534	586
	CO	lb/ton	0.52	0.75	0.56	0.61
	Total hydrocarbons	lb/ton	0.027	0.032	0.026	0.028

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
4	Stack temperature	Deg. F	340	340.1	347.5	
Kiln #4	Moisture	%	10.3	10.9	6.7	
	Oxygen	%	16.2	15.8	16.3	
	Volumetric flow, actual	acfm	47,800	48,200	49,500	
	Volumetric flow, standard	dscfm	28,000	28,100	30,000	
	Isokinetic variation	%	100.1	103.3	108.3	
Circle: Production or feed rate Capacity:		TPH feed	13.7	13.7	13.8	13.7
	Pollutant concentrations:					
	Antimony	ug/dscf	0.0412	0.0396	0.0426	
	Arsenic	ug/dscf	0.0428	0.102	0.0426	
	Barium	ug/dscf	0.0969	0.324	0.243	
	Beryllium	ug/dscf	0.00526	0.02077	0.00500	
	Cadmium	ug/dscf	0.626	0.868	0.102	
	Chromium	ug/dscf	0.263	0.378	0.0877	
	Hexavalent Chromium	ug/dscf	ND	ND	ND	
	Lead	ug/dscf	1.02	5.55	4.11	
	Mercury	ug/dscf	0.0976	0.0760	0.0790	
	Silver	ug/dscf	0.0375	0.0508	0.0324	
	Thallium	ug/dscf	0.0052	0.0100	0.0157	
	CO2 (Cr+6 test)	%	5.4	5.0	4.8	
	CO2 (metals)	%	4.9	5.1	4.5	
	CO	ppm	138.9	72.5	61.9	
	Total hydrocarbons	ppm	5	3.3	1.4	
	Pollutant mass flux rates:					
	Antimony	lb/hr	0.0001389	0.000147	0.0001692	
	Arsenic	lb/hr	0.0001587	0.0003776	0.0001692	
	Barium	lb/hr	0.0003588	0.0012031	0.0009658	
	Beryllium	lb/hr	1.949E-05	7.72E-05	1.985E-05	
	Cadmium	lb/hr	0.0023199	0.00322	0.0004049	
	Chromium	lb/hr	0.0009745	0.00140	0.0003482	
	Hexavalent Chromium	lb/hr	ND	ND	ND	
	Lead	lb/hr	0.00379	0.0206	0.0163	
	Mercury	lb/hr	0.0003614	0.0002824	0.0003137	
	Silver	lb/hr	0.0001389	0.0001888	0.0001285	
	Thallium	lb/hr	1.94E-05	3.735E-05	6.211E-05	
	CO2 (Cr+6 test)	lb/hr	10,786	9,713	8,929	
	CO2 (metals)	lb/hr	9,417	9,837	9,266	
	CO	lb/hr	16.9	8.86	8.08	
	Total hydrocarbons	lb/hr	0.349	0.231	0.105	
	Emission factors:					Average
	Antimony	lb/ton	1.014E-05	1.073E-05	1.226E-05	1.1E-05
	Arsenic	lb/ton	1.158E-05	2.756E-05	1.226E-05	1.7E-05
	Barium	lb/ton	2.619E-05	8.782E-05	6.998E-05	6.1E-05
	Beryllium	lb/ton	1.423E-06	5.635E-06	1.438E-06	2.8E-06
	Cadmium	lb/ton	0.0001693	0.0002354	2.934E-05	0.000145
	Chromium	lb/ton	7.113E-05	0.0001025	2.523E-05	6.63E-05
	Hexavalent Chromium	lb/ton	ND	ND	ND	ND
	Lead	lb/ton	0.0002764	0.0015063	0.0011814	0.000988
	Mercury	lb/ton	2.638E-05	2.061E-05	2.273E-05	2.32E-05
	Silver	lb/ton	1.014E-05	1.378E-05	9.31E-06	1.11E-05
	Thallium	lb/ton	1.416E-06	2.726E-06	4.501E-06	2.88E-06
	CO2 (Cr+6 test)	lb/ton	787	709	647	714
	CO2 (metals)	lb/ton	687	718	671	692
	CO	lb/ton	1.2	0.65	0.59	0.82
	Total hydrocarbons	lb/ton	0.026	0.017	0.0076	0.017

Test ID	Parameter	No. of runs	Data rating	Emission factor, kg/Mg Minimum	Maximum	Average	Emission factor, kg/Mg Minimum	Maximum	Average	Ref. No.
Kiln #2	Filterable PM	3	B	0.012	0.017	0.014	0.023	0.035	0.029	18
	Hydrogen chloride	3	B	2.0	2.5	2.2	4.0	5.0	4.4	18
	Chlorine	3	B	0.013	0.11	0.051	0.026	0.23	0.10	18
	CO2	9	B	259	320	291	517	641	582	18
Kiln #4	Filterable PM	3	B	0.015	0.053	0.029	0.029	0.11	0.059	18
	Hydrogen chloride	3	B	2.1	2.7	2.5	4.2	5.4	4.9	18
	Chlorine	3	B	0.00071	0.10	0.044	0.0014	0.20	0.088	18
	CO2	3	B	315	394	348	629	787	695	18
Kiln #2	Antimony	3	B	2.2E-06	7.0E-06	4.5E-06	4.5E-06	1.4E-05	8.9E-06	18
	Arsenic	3	B	4.7E-06	1.4E-05	9.0E-06	9.4E-06	2.7E-05	1.8E-05	18
	Barium	3	B	2.8E-05	6.0E-05	4.4E-05	5.6E-05	1.2E-04	8.8E-05	18
	Beryllium	3	B	1.5E-06	2.5E-06	1.8E-06	2.9E-06	5.1E-06	3.7E-06	18
	Cadmium	3	B	2.1E-05	0.00047	0.00022	4.2E-05	0.00093	0.00044	18
	Chromium	3	B	2.8E-05	3.6E-05	3.2E-05	5.5E-05	7.3E-05	6.3E-05	18
	Lead	3	B	0.00020	0.00060	0.00039	0.00041	0.0012	0.00078	18
	Mercury	3	B	1.32E-05	2.28E-05	1.77E-05	2.65E-05	4.56E-05	3.54E-05	18
	Silver	3	B	3.06E-06	9.54E-05	3.39E-05	6.13E-06	0.000191	6.79E-05	18
	Thallium	3	B	5.88E-07	3.2E-06	1.89E-06	1.18E-06	6.4E-06	3.38E-06	18
	CO	3	B	0.26	0.37	0.30	0.52	0.75	0.61	18
	Total hydrocarbons	3	B	0.013	0.016	0.014	0.026	0.032	0.028	18
Kiln #4	Antimony	3	B	5.07E-06	6.13E-06	5.52E-06	1.0E-05	1.23E-05	1.1E-05	18
	Arsenic	3	B	5.79E-06	1.38E-05	8.57E-06	1.16E-05	2.76E-05	1.71E-05	18
	Barium	3	B	1.31E-05	4.39E-05	3.07E-05	2.62E-05	8.78E-05	6.13E-05	18
	Beryllium	3	B	7.11E-07	2.82E-06	1.42E-06	1.42E-06	5.63E-06	2.83E-06	18
	Cadmium	3	B	1.47E-05	0.000118	7.23E-05	2.93E-05	0.000235	0.000145	18
	Chromium	3	B	1.26E-05	5.12E-05	3.31E-05	2.52E-05	0.00010	6.63E-05	18
	Lead	3	B	0.000138	0.000753	0.000494	0.000276	0.0015	0.000988	18
	Mercury	3	B	1.0E-05	1.32E-05	1.16E-05	2.06E-05	2.64E-05	2.32E-05	18
	Silver	3	B	4.65E-06	6.89E-06	5.54E-06	9.31E-06	1.38E-05	1.11E-05	18
	Thallium	3	B	7.08E-07	2.25E-06	1.44E-06	1.42E-06	4.5E-06	2.88E-06	18
	CO	3	B	0.29	0.62	0.41	0.59	1.2	0.82	18
	Total hydrocarbons	3	B	0.003798	0.013	0.0083	0.0076	0.026	0.017	18
Kiln #2	Filterable PM	3	B	0.18	0.35	0.25	0.36	0.70	0.50	19
	Hydrogen chloride	3	B	2.4	2.7	2.6	4.7	5.3	5.1	19
	Chlorine	3	B	0.0050	0.019	0.011	0.010	0.037	0.022	19
	CO2	9	B	259	338	297	519	675	593	19
	CO	3	B	0.41	0.82	0.64	0.83	1.6	1.3	19
	Total hydrocarbons	4	B	0.015	0.030	0.024	0.029	0.060	0.047	19
	Antimony	3	B	0.0011	0.0050	0.0037	0.0021	0.0099	0.0073	19
	Arsenic	3	B	0.037	0.088	0.070	0.074	0.18	0.14	19
	Barium	3	B	0.070	0.084	0.079	0.14	0.17	0.16	19
	Beryllium	3	B	0.0012	0.0041	0.0025	0.0023	0.0081	0.0051	19
	Cadmium	3	B	0.039	0.081	0.066	0.078	0.16	0.13	19
	Chromium	3	B	0.016	0.034	0.028	0.032	0.069	0.055	19
	Copper	3	B	0.0038	0.0092	0.0072	0.0075	0.018	0.014	19
	Lead	3	B	3.2	6.0	4.9	6.3	12	9.7	19
	Manganese	3	B	0.040	0.062	0.051	0.081	0.12	0.10	19
	Nickel	3	B	0.0081	0.017	0.013	0.016	0.034	0.027	19
	Phosphorus	3	B	0.046	0.072	0.063	0.093	0.14	0.13	19
	Selenium	3	B	0.00012	0.000267	0.000175	0.00024	0.00053	0.00035	19
	Silver	3	B	3.3E-05	0.00013	7.1E-05	6.6E-05	2.5E-04	0.00014	19
	Thallium	3	B	5.4E-05	0.00015	9.6E-05	0.00011	0.00031	0.00019	19
	Zinc	3	B	0.022	0.039	0.033	0.045	0.079	0.065	19
Kiln #7	Filterable PM	3	B	0.041	0.062	0.050	0.083	0.12	0.10	20
	Hydrogen chloride	3	B	3.1	3.4	3.3	6.1	6.8	6.5	20
	Chlorine	3	B	0.0026	0.022	0.011	0.0052	0.043	0.022	20
	CO2	9	B	235	268	255	470	535	509	20
Kiln # 8	Filterable PM	3	B	0.087	0.22	0.17	0.17	0.44	0.35	20
	Hydrogen chloride	3	B	1.6	1.8	1.7	3.2	3.6	3.4	20
	Chlorine	3	B	0.0028	0.0042	0.0036	0.0057	0.0084	0.0072	20
	CO2	9	B	201	226	214	403	451	427	20
Kiln # 7	Antimony	3	B	0.00028	0.00045	0.00036	0.00057	0.00091	0.00072	20
	Arsenic	3	B	3.0E-06	4.6E-05	3.1E-05	6.08E-06	9.16E-05	6.19E-05	20
	Barium	3	B	2.4E-05	4.4E-05	3.5E-05	4.74E-05	8.78E-05	7.05E-05	20
	Beryllium	3	B	1.6E-06	3.3E-06	2.4E-06	3.69E-06	6.54E-06	4.74E-06	20
	Cadmium	3	B	2.4E-06	3.1E-06	2.7E-06	4.89E-06	6.24E-06	5.36E-06	20
	Chromium	3	B	1.6E-05	2.5E-05	2.0E-05	3.28E-05	4.98E-05	3.91E-05	20
	Hexavalent Chromium	3	B	1.3E-06	2.9E-06	2.2E-06	2.63E-06	5.82E-06	4.34E-06	20
	Lead	3	B	0.00033	0.0018	0.00090	0.000658	0.0036	0.0018	20
	CO	3	B	0.051	0.11	0.071	0.10	0.22	0.14	20
	Total hydrocarbons	3	B	0.0062	0.0093	0.0076	0.012	0.019	0.015	20
Kiln # 8	Antimony	3	B	3.5E-06	5.7E-05	2.7E-05	7.0E-06	0.000114	5.4E-05	20
	Arsenic	3	B	7.1E-05	0.00017	0.00012	0.000142	0.000331	0.000242	20
	Barium	3	B	8.0E-05	9.1E-05	8.4E-05	0.00016	0.000182	0.000168	20
	Beryllium	3	B	2.9E-06	5.7E-06	4.6E-06	5.76E-06	1.14E-05	9.2E-06	20
	Cadmium	3	B	0.00010	0.00015	0.00012	0.00020	0.000293	0.000239	20
	Chromium	3	B	4.1E-05	0.00011	7.5E-05	8.28E-05	0.000215	0.000149	20
	Lead	3	B	0.0019	0.0024	0.0021	0.0038	0.0047	0.0043	20
	Silver	3	B	2.7E-06	4.2E-06	3.5E-06	5.5E-06	8.4E-06	7.0E-06	20
	Thallium	3	B	1.6E-06	2.3E-06	2.0E-06	3.1E-06	4.6E-06	3.9E-06	20
	CO	3	B	0.0074	0.014	0.011	0.015	0.028	0.022	20
	Total hydrocarbons	3	B	0.0058	0.011	0.0083	0.012	0.023	0.017	20

CASRADE

Metals Emissions

Kiln #2

Run 1

FlowRate dscfh	Sample Vol dscf		Front (ug)		Back (ug)		Total (ug)		ug/cmeter		Mass Flows lbs./hr.		g/hr.
1920000	54.566	Ag	0.682	<	0.971	<	1.653	<	1.070	<	-0.000	<	0.058
1920000	54.566	As	2.451		0.554		3.005		1.945		0.000		0.106
1920000	54.566	Ba	19.95	<	2.78	<	22.73	<	14.711	<	0.002	<	0.800
1920000	54.566	Be	0.374	<	0.278	<	0.652	<	0.422	<	0.000	<	0.023
1920000	54.566	Cd	5.45		2.05		7.5		4.854		0.001		0.264
1920000	54.566	Cr	8.95	<	1.67	<	10.62	<	6.873	<	0.001	<	0.374
1920000	54.566	Pb	70.75		0.91		71.66		46.378		0.008		2.521
1920000	54.566	Sb	< 0.475		1.21	<	1.685	<	1.091	<	0.000	<	0.059
1920000	54.566	Tl	0.32	<	0.264	<	0.584	<	0.378	<	0.000	<	0.021
1920000	54.566	Hg	< 0.4		4.48	<	4.88	<	3.158	<	0.000	<	0.172

Run 2

FlowRate dscfh	Sample Vol dscf		Front (ug)		Back (ug)		Total (ug)		ug/cmeter		Mass Flows lbs./hr.		g/hr.
1992000	55.104	Ag	32.26	<	1.02	<	33.28	<	21.328	<	0.003	<	1.203
1992000	55.104	As	3.933		0.765		4.698		3.011		0.000		0.170
1992000	55.104	Ba	13.75	<	2.91	<	16.66	<	10.677	<	0.001	<	0.602
1992000	55.104	Be	0.725	<	0.291	<	1.016	<	0.651	<	0.000	<	0.037
1992000	55.104	Cd	55.55		1.44		56.99		36.523		0.005		2.060
1992000	55.104	Cr	11.65	<	1.75	<	13.4	<	8.588	<	0.001	<	0.484
1992000	55.104	Pb	126.55	<	0.276	<	126.826	<	81.279	<	0.010	<	4.585
1992000	55.104	Sb	0.722		1.7		2.422		1.552		0.000		0.088
1992000	55.104	Tl	0.96	<	0.276	<	1.236	<	0.792	<	0.000	<	0.045
1992000	55.104	Hg	< 0.4		7.64	<	8.04	<	5.153	<	0.001	<	0.291

Run 3

FlowRate dscfh	Sample Vol dscf		Front (ug)		Back (ug)		Total (ug)		ug/cmeter		Mass Flows lbs./hr.		g/hr.
1842000	57.15	Ag	0.7144	<	0.949	<	1.6634	<	1.028	<	0.000	<	0.054
1842000	57.15	As	1.46		0.365		1.825		1.128		0.000		0.059
1842000	57.15	Ba	9.45	<	2.71	<	12.16	<	7.514	<	0.001	<	0.392
1842000	57.15	Be	0.47	<	0.271	<	0.741	<	0.458	<	0.000	<	0.024
1842000	57.15	Cd	179.55		1.55		181.1		111.906		0.013		5.837
1842000	57.15	Cr	11.05	<	1.63	<	12.68	<	7.835	<	0.001	<	0.409
1842000	57.15	Pb	233.7		0.747		234.447		144.871		0.017		7.556
1842000	57.15	Sb	0.03		0.841		0.871		0.538		0.000		0.028
1842000	57.15	Tl	< 0.2	<	0.257	<	0.457	<	0.282	<	0.000	<	0.015
1842000	57.15	Hg	< 0.4		6.42	<	6.82	<	4.214	<	0.000	<	0.220

Note: ALL VALUES ARE CORRECTED FOR BLANKS PER SPECIFIED METHOD

CASCADE

Metals Emissions

Kiln #4

Run 1

FlowRate dscfh	Sample Vol dscf		Front		Back		Total		ug/cmeter		Mass Flows lbs./hr.		g/hr.
1680000	42.946	Ag	1.15	<	0.915	<	2.065	<	1.698	<	0.000	<	0.081
1680000	42.946	As	1.12		0.715		1.835		1.509		0.000		0.072
1680000	42.946	Ba	2.85	<	2.62	<	5.47	<	4.498	<	0.000	<	0.214
1680000	42.946	Be	< 0.19	<	0.262	<	0.452	<	0.372	<	0.000	<	0.018
1680000	42.946	Cd	10.75		16.1		26.85		22.079		0.002		1.050
1680000	42.946	Cr	8.75		2.54		11.29		9.284		0.001		0.442
1680000	42.946	Pb	43.15		0.75		43.9		36.099		0.004		1.717
1680000	42.946	Sb	0.92		0.85		1.77		1.455		0.000		0.069
1680000	42.946	Tl	< 0.2	<	0.249	<	0.449	<	0.369	<	0.000	<	0.018
1680000	42.946	Hg	< 0.4		3.99	<	4.39	<	3.610	<	0.000	<	0.172

Run 2

FlowRate dscfh	Sample Vol dscf		Front		Back		Total		ug/cmeter		Mass Flows lbs./hr.		g/hr.
1686000	44.49	Ag	1.8	<	0.913	<	2.713	<	2.153	<	0.000	<	0.103
1686000	44.49	As	3.15		1.365		4.515		3.584		0.000		0.171
1686000	44.49	Ba	13.05	<	2.61	<	15.66	<	12.430	<	0.001	<	0.593
1686000	44.49	Be	0.793	<	0.261	<	1.054	<	0.837	<	0.000	<	0.040
1686000	44.49	Cd	35.15		3.43		38.58		30.623		0.003		1.462
1686000	44.49	Cr	16.05	<	1.57	<	17.62	<	13.986	<	0.001	<	0.668
1686000	44.49	Pb	239.4		7.25		246.65		195.782		0.021		9.347
1686000	44.49	Sb	0.32		1.44		1.76		1.397		0.000		0.067
1686000	44.49	Tl	< 0.2		0.347	<	0.547	<	0.434	<	0.000	<	0.021
1686000	44.49	Hg	< 0.4		3.18	<	3.58	<	2.842	<	0.000	<	0.136

Run 3

FlowRate dscfh	Sample Vol dscf		Front		Back		Total		ug/cmeter		Mass Flows lbs./hr.		g/hr.
1800000	44.788	Ag	1	<	0.905	<	1.905	<	1.502	<	0.000	<	0.077
1800000	44.788	As	1.33		0.575		1.905		1.502		0.000		0.077
1800000	44.788	Ba	9.6	<	2.58	<	12.18	<	9.604	<	0.001	<	0.490
1800000	44.788	Be	< 0.19	<	0.258	<	0.448	<	0.353	<	0.000	<	0.018
1800000	44.788	Cd	3.11		1.46		4.57		3.603		0.000		0.184
1800000	44.788	Cr	3.15	<	1.55	<	4.7	<	3.706	<	0.000	<	0.189
1800000	44.788	Pb	179.55		4.14		183.69		144.836		0.016		7.382
1800000	44.788	Sb	1.21		1.45		2.66		2.097		0.000		0.107
1800000	44.788	Tl	< 0.2		0.601	<	0.801	<	0.632	<	0.000	<	0.032
1800000	44.788	Hg	< 0.4		3.34	<	3.74	<	2.949	<	0.000	<	0.150

Note: ALL VALUES ARE CORRECTED FOR BLANKS PER SPECIFIED METHOD