

US EPA ARCHIVE DOCUMENT

	B	C
1	Source Description	
2		
3	Phase II ID No.	901
4	EPA ID No.	TND982109142
5	Facility Name	Diversified Scientific Services, Inc.
6	Facility Location	
7	City	Kingston
8	State	TN
9	Unit ID Name/No.	DSSI Mixed Waste Industrial Boiler System
10	Other Sister Facilities	None
11	Number of Sister Facilities	0
12	Combustor Class	Liquid-fired boiler, commercial, mixed waste
13	Combustor Type	Liquid-fired
14	Combustor Characteristics	Firetube boiler. 3-pass dry back Scotch Marine firetube, Superior Boiler Model # 4-X-1758-S200-CF, 1990 installed, 14.7 MM BTU/hr, John Zink burner LN-HIV-30
15	Capacity (MMBtu/hr)	15
16	Soot Blowing	No?
17	APCS Detailed Acronym	SD/FF/PBS/RH/HEPA
18	APCS General Class	LEWS, FF, RH, HEPA
19	APCS Characteristics	Spray dryer, fabric filter, packed bed scrubber, reheater, high efficiency particulate air filter. Fabric filter -- Gore-Tex cloth filter, 4:1 A/C, 250F; PBS -- 1.8 L/G, NaOH
20	Hazardous Wastes	Liq
21	Haz Waste Description	Organic chemicals. Permitted to burn all codes except F020-F027.
22	Supplemental Fuel	Misc. fuel
23		Propane
24	Stack Characteristics	
25	Diameter (ft)	1.5
26	Height (ft)	?
27	Gas Velocity (ft/sec)	67.1
28	Gas Temperature (°F)	177
29		
30	Permitting Status	BIF Tier I: Sb, Ba, Hg, Ag, Tl; Tier III: As, Be, Cd, Cr, Pb, Cl
31	HWC Burn Status (Date if Terminated)	

	B	C
1	Cond Description	
2		
3	901C1	
4		
5	Report Name/Date	BIF Revised Certification of Compliance for Hazardous Waste Boiler Operation, April 1996
6	Report Prepare	Diversified Scientific Services. Inc.
7	Testing Firm	Radian International, LLC
8	Testing Dates	February 22, 1996
9	Cond Dates	Feb-96
10	Cond Description	CoC, max feed, flow, and prod rate, max temp
11	Content	PM, As, Be, Cd, Cr, Pb, HCl/Cl2, CO
12		
13	901C2	
14		
15	Report Name/Date	BIF Revised Certification of Compliance for Hazardous Waste Boiler Operation, April 1996
16	Report Prepare	Diversified Scientific Services. Inc.
17	Testing Firm	Radian International, LLC
18	Testing Dates	February 23-24, 1996
19	Cond Dates	Feb-96
20	Cond Description	CoC, max feed and flowrate, min pressure drop
21	Content	PM, As, Be, Cd, Cr, Pb, HCl/Cl2, CO

	B	C	D	E	F	G	H	I	J	K	L	M
1	Stack Gas Emissions											
2												
3		Comments	Units	7% O2								
4												
5	901C1					R1		R2		R3		Cond Avg
6												
7	PM	E1	gr/dscf	y		0.0032		0.0020		0.0018		0.0023
8	CO (RA)	E1	ppmv	y		20.8		24.8		12.1		19.2
9	CO (MHRA)	E1	ppmv	y		27.4		71.4		16.9		38.6
10	HCl		g/hr			2.25		6.87		17.7		8.94
11	Cl2		g/hr			1.94		3.23		6.76		3.98
12	Arsenic		g/hr			0.0018		0.0019		0.012		0.0052
13	Beryllium		g/hr			0.00019		0.00013		0.00014		0.0002
14	Cadmium		g/hr			0.021		0.0071		0.0044		0.0108
15	Chromium		g/hr			0.014		0.012		0.015		0.014
16	Chromium (Hex)		g/hr		nd	0.00046	nd	0.0004	nd	0.00041		0.00042
17	Lead		g/hr			0.0059		0.0089		0.004		0.0063
18												
19	Sampling Train	PM, HCl/Cl2	E1									
20	Stack Gas Flowrate		dscfm			4442		4447		4600		4496
21	O2		%			9.5		9.8		9.3		9.5
22	CO2		%			7.3		7.7		7.8		7.6
23	Moisture		%			21.6		20.4		20.8		20.9
24	Temperature		°F			177		177		178		177
25												
26	Sampling Train	Metals	E2									
27	Stack Gas Flowrate		dscfm			4827		4735		4557		4706.3
28	O2		%			9.5		9.8		9.3		9.5
29	CO2		%			7.3		7.7		7.8		7.6
30	Moisture		%			20.1		19.9		19.9		20.0
31	Temperature		°F			175		177		177		176
32												
33	HCl	E1	ppmv	y		0.24		0.76		1.81		0.95
34	Cl2	E1	ppmv	y		0.11		0.18		0.36		0.22
35	Total Chlorine	E1	ppmv	y		0.46		1.13		2.52		1.39
36												
37	Arsenic	E2	µg/dscm	y		0.27		0.30		1.86		0.80
38	Beryllium	E2	µg/dscm	y		0.03		0.02		0.02		0.02
39	Cadmium	E2	µg/dscm	y		3.12		1.10		0.68		1.655
40	Chromium	E2	µg/dscm	y		2.08		1.87		2.32		2.09
41	Chromium (Hex)	E2	µg/dscm	y	100	0.07	100	0.06	100	0.06	100	0.06
42	Lead	E2	µg/dscm	y		0.88		1.38		0.62		0.96
43	SVM	E2	µg/dscm	y		4.00		2.49		1.30		2.61
44	LVM	E2	µg/dscm	y		2.38		2.18		4.20		2.91
45												
46												
47	901C2					R1		R2		R3		Cond Avg
48												
49	PM	E1	gr/dscf	y		0.00076		0.012		0.0019		0.0049
50	CO (RA)	E1	ppmv	y		1.9		5.3		2.6		3.3
51	CO (MHRA)	E1	ppmv	y		7		12.5		3.7		7.7
52	HCl		g/hr			1.08		1.24		0.62		0.98
53	Cl2		g/hr			0.62		0.73		4.09		1.81
54	Arsenic		g/hr			0.00050		0.00051		0.0016		0.00087
55	Beryllium		g/hr			0.00013		0.00018		0.00018		0.00016
56	Cadmium		g/hr			0.0033		0.0028		0.0053		0.0038
57	Chromium		g/hr			0.013		0.008		0.009		0.010
58	Chromium (Hex)		g/hr			0.00035		0.00033		0.00034		0.00034
59	Lead		g/hr			0.0073		0.0015		0.0020		0.0036
60												
61	Sampling Train	PM, HCl/Cl2	E1									
62	Stack Gas Flowrate		dscfm			2142		2311		2147		2200
63	O2		%			15.6		15.6		15.8		15.7
64	CO2		%			7.3		7.7		7.8		7.6
65	Moisture		%			12.8		12		10.5		11.8
66	Temperature		°F			153		147		146		149
67												

	B	C	D	E	F	G	H	I	J	K	L	M
68	Sampling Train	Metals	E2									
69	Stack Gas Flowrate		dscfm			2152		2350		2164		2222
70	O2		%			15.6		15.6		15.8		15.7
71	CO2		%			7.3		7.7		7.8		7.6
72	Moisture		%			14.9		10.2		9.9		11.7
73	Temperature		°F			149		146		144		146
74												
75	HCl	E1	ppmv	y		0.51		0.55		0.31		0.46
76	Cl2	E1	ppmv	y		0.15		0.17		1.04		0.44
77	Total Chlorine	E1	ppmv	y		0.82		0.88		2.38		1.34
78												
79	Arsenic	E2	µg/dscm	y		0.35		0.33		1.17		0.62
80	Beryllium	E2	µg/dscm	y		0.09		0.12		0.13		0.11
81	Cadmium	E2	µg/dscm	y		2.34		1.82		3.88		2.68
82	Chromium	E2	µg/dscm	y		9.22		5.20		6.59		7.01
83	Chromium (Hex)	E2	µg/dscm	y		0.25		0.21		0.25		0.24
84	Lead	E2	µg/dscm	y		5.18		0.97		1.47		2.54
85	SVM	E2	µg/dscm	y		7.52		2.79		5.35		5.22
86	LVM	E2	µg/dscm	y		9.67		5.65		7.90		7.74

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1	Feedstreams																									
2																										
3																										
4																										
5	901C1																									
6	Feedstream Number																									
7	Feed Class																									
8	Feed Class 2																									
9	Feedstream Description																									
10	Feed Rate	g/hr																								
11	Heating Value	Btu/lb																								
12	Ash	g/hr																								
13	Chlorine	g/hr																								
14	Antimony	g/hr																								
15	Arsenic	g/hr																								
16	Barium	g/hr																								
17	Beryllium	g/hr																								
18	Cadmium	g/hr																								
19	Chromium	g/hr																								
20	Lead	g/hr																								
21	Mercury	g/hr																								
22	Silver	g/hr																								
23	Thallium	g/hr																								
24	Flowrate	dscfm																								
25	Oxygen	%																								
26	Thermal Feedrate	MMBtu/hr																								
27	Estimated Firing Rate	MMBtu/hr																								
28																										
29	Feedrate MTEC Calculations	mg/dscm																								
30	Ash	ug/dscm																								
31	Chlorine	ug/dscm																								
32	Antimony	ug/dscm																								
33	Arsenic	ug/dscm																								
34	Barium	ug/dscm																								
35	Beryllium	ug/dscm																								
36	Cadmium	ug/dscm																								
37	Chromium	ug/dscm																								
38	Lead	ug/dscm																								
39	Mercury	ug/dscm																								
40	Silver	ug/dscm																								
41	Thallium	ug/dscm																								
42	SVM	ug/dscm																								
43	LVM	ug/dscm																								
44																										
45	901C2																									
46	Feedstream Number																									
47	Feed Class																									
48	Feed Class 2																									
49	Feedstream Description																									
50	Feed Rate	g/hr																								
51	Heating Value	Btu/lb																								
52	Ash	g/hr																								
53	Chlorine	g/hr																								

	B		AB	AC	AD	AE	AF	AG	AH	AI	AJ
1	Feedstreams										
2											
3											
4											
5	901C1	Cond Avg									Cond Avg
6											
7	Feedstream Number	F3									F4
8	Feed Class	Spike									Total
9	Feed Class 2	Spike									Total
10	Feedstream Description	Spike									Total
11	Feed Rate	41820									
12	Heating Value	6243									
13	Ash										
14	Chlorine	10393									
15	Antimony										
16	Arsenic	8									
17	Barium										
18	Beryllium	16									
19	Cadmium	20									
20	Chromium	3									
21	Lead	104									
22	Mercury										
23	Silver										
24	Thallium										
25											
26	Flowrate	4496.3									4496.3
27	Oxygen	9.5									9.5
28											
29	Thermal Feedrate	0.6									16.5
30	Estimated Firing Rate										16.4
31											
32	<i>Feedrate MTEC Calcula</i>										
33	Ash				3786.5		3681.6		3388.7		3619.0
34	Chlorine	1662998.7		1689898.6		1695138.4		1603959.3			1662998.7
35	Antimony										
36	Arsenic	1331.6		1342.9		1377.3		1274.6			1331.6
37	Barium			387369.3		397298.1		367669.7			384112.4
38	Beryllium	2496.7		2517.9		2582.4		2389.9			2496.7
39	Cadmium	3265.0		3292.6		3377.0		3125.2			3265.0
40	Chromium	500.9		505.2		518.1		479.5			500.9
41	Lead	16644.9		16786.0		17216.2		15932.4			16644.9
42	Mercury			2259.7		2317.6		2144.7			2240.7
43	Silver			22596.5		23175.7		21447.4			22406.6
44	Thallium			2259.7		2317.6		2144.7			2240.7
45	SVM	19909.8		20078.6		20593.3		19057.5			19909.8
46	LVM	4329.3		4366.0		4477.9		4143.9			4329.3
47											
48											
49	901C2	Cond Avg									Cond Avg
50											
51	Feedstream Number	F3									F4
52	Feed Class	Spike									Total
53	Feed Class 2	Spike									Total
54	Feedstream Description	Spike									Total
55	Feed Rate	76470									
56	Heating Value	6243									
57	Ash	7166									
58	Chlorine	10317									

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
59	Antimony		g/hr		14		14		14		14.0										8.32		8.32			8.32
60	Arsenic		g/hr																							
61	Barium		g/hr		2400		2400		2400		2400.0															
62	Beryllium		g/hr																		15.6		15.6			15.6
63	Cadmium		g/hr																		20.4		20.4			20.4
64	Chromium		g/hr																		3.13		3.13			3.13
65	Lead		g/hr																		104		104			104
66	Mercury		g/hr		14		14		14		14.0															
67	Silver		g/hr		140		140		140		140.0															
68	Thallium		g/hr		14		14		14		14.0															
69																										
70	Flowrate		dscfm		2142		2311		2147		2200.00										2142		2311			2147
71	Oxygen		%		15.6		15.6		15.8		15.67										15.6		15.6			15.8
72																										
73	Thermal Feedrate		MMBtu/hr								1.5															
74	Estimated Firing Rate		MMBtu/hr																							
75																										
76	Feedrate MTEC Calculations																									
77	Ash		mg/dscm		1943.8		1807.0		2050.1		1933.6										9872.5		4227.7			921.7
78	Chlorine		ug/dscm																		7299230.5		6917407.0			7562317.7
79	Antimony		ug/dscm																		5930.6		5496.9			6144.4
80	Arsenic		ug/dscm																							
81	Barium		ug/dscm																							
82	Beryllium		ug/dscm		1710757.2		1585652.0		1772418.2		1689609.1										11119.9		10306.7			11520.7
83	Cadmium		ug/dscm																		14541.4		13478.0			15065.6
84	Chromium		ug/dscm																		2231.1		2068.0			2311.5
85	Lead		ug/dscm																		74132.8		68711.6			76804.8
86	Mercury		ug/dscm		9979.4		9249.6		10339.1		9856.1															
87	Silver		ug/dscm		99794.2		92496.4		103391.1		98560.5															
88	Thallium		ug/dscm		9979.4		9249.6		10339.1		9856.1															
89	SVM		ug/dscm																							
90	LVM		ug/dscm																		88674.2		82189.6			91870.3
91																					19281.7		17871.6			19976.6
92																										
93	BIF Feedrate Limits																									
94																										
95	Antimony		g/hr								14.00															
96	Barium		g/hr								2400.00															
97	Mercury		g/hr								14.00															
98	Silver		g/hr								140.00															
99	Thallium		g/hr								14.00															

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ
59	Antimony									
60	Arsenic	8.32								
61	Barium									
62	Beryllium	15.6								
63	Cadmium	20.4								
64	Chromium	3.1								
65	Lead	104.0								
66	Mercury									
67	Silver									
68	Thallium	104.0								
69										
70	Flowrate	2200								2200.0
71	Oxygen	15.7								15.7
72										
73	Thermal Feedrate	1.1								4.4
74	Estimated Firing Rate									3.7
75										
76	Feedrate MTEC Calcula.									
77	Ash	5007.3	11816.3			6034.7		2971.8		6940.9
78	Chlorine	7259651.7	7299230.5			6917407.0		7562317.7		7259651.7
79	Antimony									
80	Arsenic	5857.3	5930.6			5496.9		6144.4		5857.3
81	Barium		1710757.2			1585652.0		1772418.2		1689609.1
82	Beryllium	10982.5	11119.9			10306.7		11520.7		10982.5
83	Cadmium	14361.7	14541.4			13478.0		15065.6		14361.7
84	Chromium	2203.5	2231.1			2068.0		2311.5		2203.5
85	Lead	73216.4	74132.8			68711.6		76804.8		73216.4
86	Mercury		9979.4			9249.6		10339.1		9856.1
87	Silver		99794.2			92496.4		103391.1		98560.5
88	Thallium		9979.4			9249.6		10339.1		9856.1
89	SVM	87578.1	88674.2			82189.6		91870.3		87578.1
90	LVM	19043.3	19281.7			17871.6		19976.6		19043.3
91										
92										
93	BIF Feedrate Limits									
94										
95	Antimony									
96	Barium									
97	Mercury									
98	Silver									
99	Thallium									

	A	B	C
1	Process Information		
2			
3		Units	Cond Avg
4			
5	901C1		
6			
7	Comb Cham Temp	°F	1900
8	FF Inlet Temp	°F	245
9	PBS pH		7
10	PBS L/G	gpm/acfm	1.4
11	PBS Blowdown	gpm	0.4
12			
13	901C2		
14			
15	Comb Cham Temp	°F	NA
16	FF Inlet Temp	°F	NA
17	PBS pH		NA
18	PBS L/G	gpm/acfm	NA
19	PBS Blowdown	gpm	NA