	A	B
1	**Source Description**	
2		
3	Phase II ID No.	844
4	EPA ID No.	TXD008092793
5	Facility Name	Dow Chemical Company
6	Facility Location	
7	City	Freeport
8	State	TX
9	Unit ID Name/No.	F-2AB
10	Other Sister Facilities	None
11	Combustor	HCl Production Furnace
12	Combustor Characteristics	Cleaver-Brooks firetube boiler, Cleaver-Brooks horizontal direct fired comb chamber, capacity 1600 HP, operated @ 700-1200C
13	Capacity (MMBtu/hr)	35
14	Soot Blowing	None
15	APCS	WHB/HCLABS/WS
16	APCS Characteristics	HCl absorber, chlorine scrubber. T-72 Chlorine Scrubber, gases contact water and caustic in scrubber medium, inorganic reducing agent used to capture chlorine
17	Hazardous Wastes	Liq
18	Haz Waste Description	Liquid wastes (D-700)
19	Supplemental Fuel	Natural gas
20		
21	Stack Characteristics	
22	Diameter (ft)	2.5
23	Height (ft)	51
24	Gas Velocity (ft/sec)	27.5
25	Gas Temperature (°F)	135
26		
27	Permitting Status	Tier I for all metals
28	HWC Burn Status (Date if Terminated)	

	A	B
1	**Cond Description**	
2		
3	**844C1**	
4		
5	Report Name/Date	F-2AB Trial Burn Report and Risk Burn Report, September 2, 1998
6	Report Prepare	Focus Environmental, Inc.
7	Testing Firm	METCO Environmental
8	Testing Dates	July 30, 1998
9	Cond Dates	Jul-98
10	Condition Descr	Trial burn, min comb temp and max velocity
11	Content	CO, DRE (chlorobenzene)
12		
13	**844C1A**	
14		
15	Report Name/Date	F-2AB Trial Burn Report and Risk Burn Report, September 2, 1998
16	Report Prepare	Focus Environmental, Inc.
17	Testing Firm	METCO Environmental
18	Testing Dates	July 29, 1998
19	Cond Dates	Jul-98
20	Condition Descr	Trial burn, min comb temp and max velocity
21	Content	CO, DRE (chlorobenzene)
22		
23	**844C2**	
24		
25	Report Name/Date	F-2AB Trial Burn Report and Risk Burn Report, September 2, 1998
26	Report Prepare	Focus Environmental, Inc.
27	Testing Firm	METCO Environmental
28	Testing Dates	July 28, 1998
29	Cond Dates	Jul-98
30	Condition Descr	Risk burn, slightly above normal liq waste feed rate, normal comb temp
31	Content	Metals, PCDD/F

	B	C	D	E	F	G	H	I	J	K	L	M
1	**Stack Gas Emissions**											
2												
3		Comments	Units	7% O2		1		2		3		Cond Avg
4												
5	**Condition 1**	**Trial burn**										
6												
7	CO (MHRA)		ppmv	y		26.5		22.3		22.3		23.70
8	CO (RA)		ppmv	y		24.1		22.1		22.2		22.80
9												
10	POHC DRE	Chlorobenzene										
11	POHC Feedrate		lb/hr			40		40		40		
12	Emission Rate		lb/hr			3.75E-05		1.49E-05		1.28E-05		
13	DRE		%			99.999906		99.999963		99.999968		
14												
15	Sampling Train	DRE										
16	Stack Gas Flowrate		dscfm			8560		8529		8548		8545.7
17	O2		%			9.7		9.2		9.4		9.4
18	Moisture		%			16.68		16.54		16.92		16.7
19	Temperature		°F			137		137		137		137.0
20												
21	**Condition 1A**	**Trial Burn**				1		2		3		
22												
23	CO (MHRA)		ppmv	y		17.6		16.5		16.5		16.9
24	CO (RA)		ppmv	y		16.7		16.5		16.5		16.6
25												
26	POHC DRE	Chlorobenzene										
27	POHC Feedrate		lb/hr			40		40		40		
28	Emission Rate		lb/hr			1.73E-04		1.50E-04		1.34E-04		
29	DRE		%			99.99957		99.99963		99.99967		
30												
31	Sampling Train											
32	Stack Gas Flowrate		dscfm			6790		6741		6832		6787.7
33	O2		%			10		9.8		9.8		9.9
34	Moisture		%			14.94		15.32		15.42		15.2
35	Temperature		°F			133		134		133		133.3
36												
37	**Condition 2**	**Risk burn**				1		2		4		
38												
39	CO (MHRA)		ppmv	y		16.5		16.5		16.6		16.5
40	Antimony		µg/dscf	n	nd	0.0045	nd	0.0053	nd	0.002		
41	Arsenic		µg/dscf	n		0.036		0.0556		0.0255		
42	Barium		µg/dscf	n		27.1		76.5		43.5		
43	Beryllium		µg/dscf	n		0		0		0		
44	Cadmium		µg/dscf	n		0.0068		0.00264		0		
45	Chromium		µg/dscf	n		0		0		0		
46	Cobalt		µg/dscf	n		0.03		0.0258		0.00325		
47	Copper		µg/dscf	n		0.11		0.116		0.0625		
48	Lead		µg/dscf	n		0		0		0		
49	Manganese		µg/dscf	n		0.110		0		0.0064		
50	Mercury		µg/dscf	n	nd	0.0025	nd	0.0026	nd	0.0016		
51	Molybdenum		µg/dscf	n		0.0168		0.028		0.0167		
52	Nickel		µg/dscf	n	nd	0.010	nd	0.0425	nd	0.008		
53	Selenium		µg/dscf	n	nd	0.0095	nd	0.0094	nd	0.0035		
54	Silver		µg/dscf	n		0		0.00258		0.00359		
55	Thallium		µg/dscf	n	nd	0.0031	nd	0.0081	nd	0.003		
56	Vanadium		µg/dscf	n		0		0		0		
57												
58	Antimony		µg/dscm	y	nd	0.2	nd	0.2	nd	0.1		0.1
59	Arsenic		µg/dscm	y		1.4		2.1		1.0		1.5
60	Barium		µg/dscm	y		1072.5		2956.6		1668.2		1899.1
61	Beryllium		µg/dscm	y		0		0		0		0
62	Cadmium		µg/dscm	y		0.3		0.1		0		0.1
63	Chromium		µg/dscm	y		0		0		0		0.0
64	Cobalt		µg/dscm	y		1.2		1.0		0.1		0.8
65	Copper		µg/dscm	y		4.5		4.5		2.4		3.8
66	Lead		µg/dscm	y		0		0		0		0.0
67	Manganese		µg/dscm	y		4.4		0.0		0.2		1.5
68	Mercury		µg/dscm	y	nd	0.1	nd	0.1	nd	0.1		0.0
69	Molybdenum		µg/dscm	y		0.7		1.1		0.6		0.8
70	Nickel		µg/dscm	y	nd	0.4	nd	1.6	nd	0.3		0.4
71	Selenium		µg/dscm	y	nd	0.4	nd	0.4	nd	0.1		0.1

	B	C	D	E	F	G	H	I	J	K	L	M
72	Silver		µg/dscm	y		0.1		0.1		0.1		0.1
73	Thallium		µg/dscm	y	nd	0.1	nd	0.3	nd	0.1		0.1
74	Vanadium		µg/dscm	y		0		0		0		0.0
75	SVM		µg/dscm	y		0.3		0.1		0		0.1
76	LVM		µg/dscm	y		1.4		2.1		1.0		1.5
77												
78	Sampling Train	Metal Emmisions										
79	Stack Gas Flowrate		dscfm			8399		8699		8338		8478.7
80	O2		%									
81	Moisture		%									
82	Temperature		°F									
83												
84	Sampling Train	PCDD/PCDF										
85	Stack Gas Flowrate		dscfm			8597		8856		8382		8611.7
86	O2		%			8.5		8.2		8.1		8.3
87	Moisture		%									
88	Temperature		°F									
89												
90	Particle Size Distribution	in microns										
91	0.5-1		% wt			0.7						
92	1-5		% wt			23.1						
93	5-10		% wt			39.5						
94	10-20		% wt			36.7						
95	20-50		% wt			0						
96	50-100		% wt			0						
97	>100		% wt			0						

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	**Feedstreams**																				
2																					
3					Cond Avg																
4	**844C1**	**Trial burn**																Run1			R
5																		Total			T
6	Feedstream Description				D-700 waste F2A		D-700 waste F2B		Natural Gas F2A		Natural Gas F2B		Spike F2A		Spike F2B		F2A		F-2B		F2A
7							F2B		F2A		F2B		F2A		F2B						
8	Feed Rate		lb/hr		412.3		1190.0		431.0		10.7		20		20		434		1197		412
9	Thermal Feedrate		MMBtu/hr		3.6		10.3		10.1		2.5		0.2		0.2		3.75		10.4		3.57
10	Viscosity		cps		0.60		0.6										0.6		0.6		0.6
11	Heating Value		Btu/lb		8656.7		8656.7										8650		8650		8660
12	Density		lb/gal		8.75		8.75										8.78		8.78		8.71
13	Ash		lb/hr		0.015		0.044										0.022		0.061		0.015
14	Chlorine		lb/hr		223.3		644						6.3		6.3		239		648		231
15	Chlorobenzene		lb/hr										20		20						
16																					
17	Stack Gas Flowrate		dscfm		8545.7												8560		8560		8529
18	Oxygen		%		9.4												9.7		9.7		9.2
19																					
20	Thermal Feedrate		MMBtu/hr		3.6		10.3		8.8		2.2										
21	Est Total Firing Rate		MMBtu/hr		31.4																
22																					
23	*Feedrate MTEC Calculations*																				
24	Ash		mg/dscm		0.6		1.7										0.9		2.4		0.6
25	Chlorine		ug/dscm		8456307		24388096						238579		238579		9248939		25076620		8591679
26																					
27	**844C1A**																				
28																					
29	Feedstream Description				D-700 waste F2A		D-700 waste F2b		Natural gas F2A		Natural gas F2B		Vapor F2A		Vapor F2B				Spike		
30							F2B		F2A		F2B		F2A		F2B		F2A		F2B		Spike F2B
31	Feed Rate		lb/hr		409.0		1190.0						34.6		0		20		20		
32	Thermal Feedrate		MMBtu/hr		14.1		14.1		2.5		2.2										
33	Viscosity		cps		0.6		0.6														
34	Heating Value		Btu/lb		8913.3		8913.3														
35	Density		lb/gal		8.6		8.6														
36	Ash		lb/hr		0.0510		0.051														
37	Chlorine		lb/hr		822.3		822						2.7				6.3		6.3		
38	Chlorobenzene		lb/hr														20		20		
39																					
40	Stack Gas Flowrate		dscfm		6787.7																
41	Oxygen		%		9.9																
42																					
43	Thermal Feedrate		MMBtu/hr		3.6		10.6		2.5		2.2										
44	Est Total Firing Rate		MMBtu/hr		24.0																
45																					
46	*Feedrate MTEC Calculations*																				
47	Ash		mg/dscm		2.5		2.5														
48	Chlorine		ug/dscm		40731535		40716675						133741				312062		312062		
49																					
50	**844C2**	**Risk burn**																			
51														Run1				Run 2			Run 4
52	Feedstream Description				D-700 waste F2A		D-700 waste F2B		Natural gas F2A		Natural gas F2B			Total				Total			Total
53							F2B		F2A		F2B		F2A		F-2B		F2A		F-2B		F2A
54	Feed Rate		lb/hr		1576.0		1581.0						15553		1582		1589		1582		1578
55	Thermal Feedrate		MM Btu/hr		14.0		14.0		2.8		2.5		13.8		14.1		14.6		14.5		14.1
56	Viscosity		cps		0.525		0.525														
57	Heating Value		Btu/lb		8910		8910														
58	Density		lb/gal		8.5		8.5														
59	Ash		lb/hr		0.05		0.05						0.0528		0.0538		0.0604		0.0601		0.041
60	Chlorine		lb/hr		798.0		800						808		823		810		807		783

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	A	AH	AI	AJ	AK	AL
1																
2																
3																
4	un 2					Run 3				Cond Avg						
5	otal					Total				Total						
6		F-2B		F2A		F-2B		F2A		F-2B						
7																
8		1188		391		1185		412.3		1190.0						
9		10.3		3.35		10.2		3.6		10.3						
10		0.6		0.6		0.6		0.6		0.6						
11		8660		8570		8570		8626.7		8626.7						
12		8.71		8.76		8.76		8.8		8.8						
13		0.044		0.0094		0.028		0.0		0.0						
14		653		218		649		229.3		650.0						
15																
16																
17		8529		8548		8548		8545.7		8545.7						
18		9.2		9.4		9.4		9.4		9.4						
19																
20																
21																
22																
23																
24		1.6		0.4		1.1		0.6		1.7						
25		24287301		8229628		24500130		8684788		24615315						
26																
27																
28				Run1				Run 2				Run 3				Cond Avg
29				Total				Total				Total				Total
30		F2A		F-2B		F2A		F-2B		F2A		F-2B		F2A		F-2B
31		1583		1582		1580		1582		1584		1581		1582.3		1581.7
32		14.1		14.1		13.6		13.6		14.6		14.6		14.1		14.1
33																
34																
35																
36		0.062		0.062		0.04		0.04		0.051		0.051		0.1		0.1
37		847		846		823		824		815		814		828.3		828.0
38																
39																
40		6790		6790		6741		6741		6832		6832		6787.7		6787.7
41		10		10		8.2		8.2		8.1		8.1		9.9		9.9
42																
43																
44																
45																
46																
47		3.1		3.1		1.7		1.7		2.2		2.2		2.5		2.5
48		42448970		42398853		35703578		35746960		34615152		34572679		41030388		41013877
49																
50																
51						Cond Avg										
52						Total										
53		F-2B		F2A		F-2B										
54		1579		6240		1581										
55		14.1														
56																
57																
58																
59		0.0411		0.0514		0.051666667										
60		783														

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
61	Antimony		g/hr		0.06		0.061														
62	Arsenic		g/hr	nd	0.007	nd	0.0072					nd	0.0071	nd	0.0072	nd	0.0072	nd	0.0072	nd	0.0072
63	Barium		g/hr		0.007		0.007														
64	Beryllium		g/hr	nd	0.0021	nd	0.0021					nd	0.002	nd	0.0021	nd	0.0021	nd	0.0021	nd	0.0021
65	Cadmium		g/hr	nd	0.011	nd	0.011														
66	Chromium		g/hr		0.049		0.049						0.0555		0.0566		0.0775		0.0772		0.03
67	Lead		g/hr		0.031		0.031						0.0349		0.0356		0.0315		0.0313	nd	0.028
68	Mercury		g/hr	nd	0.021	nd	0.022					nd	0.021	nd	0.022	nd	0.022	nd	0.022	nd	0.021
69	Nickel		g/hr		0.228		0.229														
70	Se		g/hr	nd	0.030	nd	0.03														
71	Silver		g/hr	nd	0.004	nd	0.004														
72	Thallium		g/hr	nd	0.026	nd	0.026														
73	Zinc		g/hr		1.24		1.25														
74																					
75	Stack Gas Flowrate		dscfm		8478.7								8597		8597		8856		8856		8382
76	Oxygen		%		8.3								8.5		8.5		8.2		8.2		8.1
77																					
78	Thermal Feedrate		MMBtu/hr		14.0		14.1		2.8		2.5										
79	Estimated Firing Rate		MMBtu/hr		34.3																
80																					
81	*Feedrate MTEC Calculations*																				
82	Ash		mg/dscm		1.9		1.9						1.8		1.9		2.0		2.0		1.4
83	Chlorine		ug/dscm		27668106		27737449						28144959.2		28667452.3		26747527.6		26648462.7		27106322.3
84	Antimony		ug/dscm		4.7		4.7														
85	Arsenic		ug/dscm	nd	0.5	nd	0.5					nd	0.5	nd	0.6	nd	0.5	d	0.5	nd	0.5
86	Barium		ug/dscm		0.5		0.5														
87	Beryllium		ug/dscm	nd	0.2	nd	0.2					nd	0.2	nd	0.2	nd	0.2	d	0.2	nd	0.2
88	Cadmium		ug/dscm	nd	0.8	nd	0.8					nd	0.0	nd	0.0	nd	0.0	nd	0.0		0.0
89	Chromium		ug/dscm		3.7		3.7						4.3		4.3		5.6		5.6		2.3
90	Lead		ug/dscm		2.4		2.4						2.7		2.7		2.3		2.3		2.1
91	Mercury		ug/dscm	nd	1.6	nd	1.7					nd	1.6	nd	1.7	nd	1.6	d	1.6	nd	1.6
92	Nickel		ug/dscm		17.4		17.5														
93	Se		ug/dscm	nd	2.3	nd	2.3														
94	Silver		ug/dscm	nd	0.3	nd	0.3														
95	Thallium		ug/dscm	nd	2.0	nd	2.0														
96	Zinc		ug/dscm		94.7		95.5														
97	SVM		ug/dscm		2.8		2.8						2.7		2.7		2.3		2.3		2.1
98	LVM		ug/dscm		4.1		4.1						4.6		4.7		6.0		6.0		2.6

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	A	AH	AI	AJ	AK	AL
61																
62	nd	0.0072		0.007166667		0.0072										
63																
64	nd	0.0021		0.002066667		0.0021										
65																
66		0.03		0.054333333		0.0546										
67	nd	0.028		0.031466667		0.031633333										
68	nd	0.022		0.021333333		0.022										
69																
70																
71																
72																
73																
74																
75		8382		8611.7		8611.666667										
76		8.1		8.3		8.266666667										
77																
78																
79																
80																
81																
82		1.4		1.8		1.8										
83		27106322.3		27332936.4		27474079.1										
84																
85	nd	0.5														
86																
87	nd	0.2														
88		0.0														
89		2.3														
90		2.1														
91	nd	1.7		0.8		0.8										
92																
93																
94																
95																
96																
97		2.1		2.4		2.4										
98		2.6		4.4		4.4										

	A	B	C
1	**Process Information**		
2			
3	**844C1 Trial burn**		
4			
5	F-2A Comb Temp	^{o}F	1605.2
6	F-2B Comb Temp	^{o}F	1592.6
7	Prod Rate	lb/hr	19083
8	T-72 Scrubber Effluent pH	pH	12.1
9	T-72 Scrubber Effluent Flow	gpm	74.1
10	T-72 Scrubber L/G	gal/Macf	21.7
11			
12	**844C1A Trial burn**		
13			
14	F-2A Comb Temp	^{o}F	1805.0
15	F-2B Comb Temp	^{o}F	1784.6
16	Prod Rate	lb/hr	24931.0
17	T-72 Scrubber Effluent pH	pH	11.90
18	T-72 Scrubber Effluent Flow	gpm	74.8
19	T-72 Scrubber L/G	gal/Macf	16.9
20			
21	**844C2 Risk burn**		
22			
23	F-2A Comb Temp	^{o}F	1821.7
24	F-2B Comb Temp	^{o}F	1809.1
25	Prod Rate	lb/hr	26260.4
26	T-72 Scrubber Effluent pH	pH	11.8
27	T-72 Scrubber Effluent Flow	gpm	74.8
28	T-72 Scrubber L/G	gal/Macf	17.8

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	**PCDD/PCDF**														
2															
3	Facility Name and ID:		Dow Chemical Company, Freeport, TX												
4	Condition ID:		844C2												
5	Condition/Test Date:		Risk burn, above normal operating of liquid waste feed rate, normal comb temp, July 28, 1998												
6															
7			I-TEF			Run 1				Run 2				Run 4	
8			Wght Fact		Total	Total	TEQ		Total	Total	TEQ		Total	Total	TEQ
9						1/2 ND	1/2 ND			1/2 ND	1/2 ND			1/2 ND	1/2 ND
10	Detected in sample volume (pg)														
11		2,3,7,8-TCDD	1		25	25	25		28	28	28		27	27	27.0
12		Total TCDD	0		290	290	0		310	310	0		310	310	0.0
13		1,2,3,7,8-PCDD	0.5		160	160	80		110	110	55		170	170	85
14		Total PCDD	0		1000	1000	0		1200	1200	0		1100	1100	0
15		1,2,3,4,7,8-HxCDD	0.1		330	330	33		360	360	36		360	360	36
16		1,2,3,6,7,8-HxCDD	0.1		530	530	53		570	570	57		530	530	53
17		1,2,3,7,8,9-HxCDD	0.1		280	280	28		280	280	28		260	260	26
18		Total HxCDD	0		2800	2800	0		3200	3200	0		2900	2900	0
19		1,2,3,4,6,7,8-HpCDD	0.01		1900	1900	19		2000	2000	20		2000	2000	20
20		Total HpCDD	0		2800	2800	0		2900	2900	0		2900	2900	0
21		OCDD	0.001		10000	10000	10		9800	9800	10		11000	11000	11
22		2,3,7,8-TCDF	0.1		520	520	52		500	500	50		470	470	47
23		Total TCDF	0		4000	4000	0		4300	4300	0		4000	4000	0
24		1,2,3,7,8-PCDF	0.05		1800	1800	90		1800	1800	90		1700	1700	85
25		2,3,4,7,8-PCDF	0.5		1300	1300	650		1300	1300	650		1200	1200	600
26		Total PCDF	0		9600	9600	0		10000	10000	0		9600	9600	0
27		1,2,3,4,7,8-HxCDF	0.1		8300	8300	830		8700	8700	870		8100	8100	810
28		1,2,3,6,7,8-HxCDF	0.1		3800	3800	380		4100	4100	410		3600	3600	360
29		2,3,4,6,7,8-HxCDF	0.1		2500	2500	250		2600	2600	260		2400	2400	240
30		1,2,3,7,8,9-HxCDF	0.1		1900	1900	190		2000	2000	200		1900	1900	190
31		Total HxCDF	0		28000	28000	0		29000	29000	0		26000	26000	0
32		1,2,3,4,6,7,8-HpCDF	0.01		40000	40000	400		41000	41000	410		37000	37000	370
33		1,2,3,4,7,8,9-HpCDF	0.01		5800	5800	58		5600	5600	56		6100	6100	61
34		Total HCDF	0		58000	58000	0		60000	60000	0		56000	56000	0
35		OCDF	0.001		97000	97000	97		89000	89000	89		100000	100000	100
36															
37		Gas sample volume (dscf)				124.48	124.48			126.26	126.26			118.38	118.38
38		O2 (%)				8.5	8.5			8.2	8.2			8.10	8.10
39															
40		PCDD/PCDF (pg in sample)				213490.0	3245.0			209710.0	3318.8			213810.0	3121.0
41		PCDD/PCDF (ng/dscm @ 7% O2)				67.88	1.03			64.19	1.02			69.27	1.01
42															
43		TEQ Cond Avg	1.02												
44		Total Cond Avg	67.11												