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Retrofit of Waste-To-Energy Facilities Equipped with Electrostatic Precipitators

Volume II: Field and Laboratory Reports, Part 1 of 2

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National Renewable Energy Laboratory
1617 Cole Boulevard
Golden, Colorado 80401-3393
A national laboratory of the U.S. Department of Energy
Managed by the Midwest Research Institute
for the U.S. Department of Energy
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RETROFIT OF WASTE-TO-ENERGY FACILITIES EQUIPPED WITH ELECTROSTATIC PRECIPITATORS

April, 1996

VOLUME II

FIELD AND LABORATORY REPORTS

PART 1 OF 2

Prepared by
H. Gregor Rigo, Rigo & Rigo Associates, Inc.
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Under the direction of
ASME Research Committee on Industrial and Municipal Waste
Electrostatic Precipitator Retrofit Subcommittee
Department of Energy's National Renewable Energy Laboratory

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
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VOLUME II

FIELD AND LABORATORY REPORTS

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BOVAR ENVIRONMENTAL-HCL EMISSION CALCULATIONS

CLIENT - RIGO & RIGO
PROJ. # - 5416265
JOBSITE - LAYTON, UTAH
LOCATION - STACK B
DATE - NOV 17 TO NOV 22

TEST #		T1-HCL-A	T2-HCL-B	T3-HCL-A	T4-HCL-B	T5-HCL-A	T6-HCL-B
DATE (1995)		Nov 17	Nov 17	Nov 18	Nov 18	Nov 19	Nov 19
START TIME		8:15	16:45	8:30	3:30	8:45	14:45
FINISH TIME		9:15	17:45	9:30	4:30	9:45	15:45
INITIAL METER VOLUME	cu ft	0.00	0.00	0.00	0	0	0
FINAL METER VOLUME	cu ft	4.21	4.45	4.30	4.384	4.272	4.318
NET METER VOLUME VM	cu ft	4.21	4.45	4.30	4.38	4.27	4.32
METER TEMPERATURE TM	deg F	48	60	68	74.2	66.1	84.8
METER CORR. FACTOR F		1.001	1.001	1.001	1.001	1.001	1.001
ORIFICE PRESSURE DH	in.H2O	0.5	0.5	0.5	0.5	0.5	0.5
BAROMETRIC PRESSURE BP	in.Hg	25.46	25.55	25.44	25.4	25.41	25.47
STD. TEMPERATURE TR	deg F	77	77	77	77	77	77
REFERENCE METER VOL. VMR	DScf	3.79	3.93	3.73	3.75	3.71	3.63
CHLORIDE ANALYSIS CL	mg/l						
BLANK ANALYSIS BLK	mg/l						
SAMPLE VOLUME VS	mls	100	100	100	100	100	100
NET TOTAL CHLORIDE NTCL	mg	0.0	0.0	0.0	0.0	0.0	0.0
HCL CONCENTRATION C1	gr/DScf	0.000	0.000	0.000	0.000	0.000	0.000
HCL CONCENTRATION C2	g/DSm3	0.000	0.000	0.000	0.000	0.000	0.000
HCL CONCENTRATION C3	ppm v/v	0	0	0	0	0	0
STACK GAS FLOWRATE Q	DScfm						
HCL EMISSION RATE ER1	lb/hr	0.00	0.00	0.00	0.00	0.00	0.00
HCL EMISSION RATE ER2	g/s	0.00	0.00	0.00	0.00	0.00	0.00

Dry Standard conditions - 77 deg F, 29.92 in.Hg
25.0 deg C, 101.325 kPa

BOVAR ENVIRONMENTAL-HCL EMISSION CALCULATIONS

CLIENT - RIGO & RIGO
PROJ. # - 5416265
JOBSITE - LAYTON, UTAH
LOCATION - STACK B
DATE - NOV 17 TO NOV 22

TEST #		T7-HCL-A	T8-HCL-B	T9-HCL-A	T10-HCL-B	T11-HCL-A	T12-HCL-B
DATE (1995)		Nov 20	Nov 20	Nov 21	Nov 21	Nov 22	Nov 22
START TIME		9:00	14:34	9:10	12:30	12:17	
FINISH TIME		10:00	15:34	10:10	13:30	13:17	
INITIAL METER VOLUME	cu ft	0	0	0	0	0	0
FINAL METER VOLUME	cu ft	4.318	4.294	4.302	4.34	4.323	4.323
NET METER VOLUME VM	cu ft	4.32	4.29	4.30	4.34	4.32	4.32
METER TEMPERATURE TM	deg F	66.2	75.2	42.25	67.2	80.6	58
METER CORR. FACTOR F		1.001	1.001	1.001	1.001	1.001	1.001
ORIFICE PRESSURE DH	in.H2O	0.5	0.5	0.5	0.5	0.5	0.5
BAROMETRIC PRESSURE BP	in.Hg	25.55	25.52	25.08	25.29	25.49	25.5
STD. TEMPERATURE TR	deg F	77	77	77	77	77	77
REFERENCE METER VOL. VMR	DScf	3.77	3.68	3.87	3.75	3.67	3.83
CHLORIDE ANALYSIS CL	mg/l						
BLANK ANALYSIS BLK	mg/l						
SAMPLE VOLUME VS	mls	100	100	100	100	100	100
NET TOTAL CHLORIDE NTCL	mg	0.0	0.0	0.0	0.0	0.0	0.0
HCL CONCENTRATION C1	gr/DScf	0.000	0.000	0.000	0.000	0.000	0.000
HCL CONCENTRATION C2	g/DSm3	0.000	0.000	0.000	0.000	0.000	0.000
HCL CONCENTRATION C3	ppm v/v	0	0	0	0	0	0
STACK GAS FLOWRATE Q	DScfm						
HCL EMISSION RATE ER1	lb/hr	0.00	0.00	0.00	0.00	0.00	0.00
HCL EMISSION RATE ER2	g/s	0.00	0.00	0.00	0.00	0.00	0.00

Dry Standard conditions - 77 deg F, 29.92 in.Hg
25.0 deg C, 101.325 kPa

BOVAR ENVIRONMENTAL-HCL EMISSION CALCULATIONS

CLIENT - RIGO & RIGO
PROJ. # - 5416265
JOBSITE - LAYTON, UTAH
LOCATION - STACK B
DATE - NOV 23 TO NOV 28

TEST #			T13-HCL-A	T14-HCL-B	T15-HCL-A	T16-HCL-B	T17-HCL-A	T18-HCL-B
DATE (1995)			Nov 23	Nov 23	Nov 24	Nov 24	Nov 25	Nov 25
START TIME			12:50	17:45	11:55	17:05	12:38	17:58
FINISH TIME			13:50	18:45	12:55	18:05	13:38	18:58
INITIAL METER VOLUME		cu ft	0.00	0.00	0.00	0	0	0
FINAL METER VOLUME		cu ft	4.27	4.33	4.25	4.244	4.37	4.33
NET METER VOLUME	VM	cu ft	4.27	4.33	4.25	4.24	4.37	4.33
METER TEMPERATURE	TM	deg F	83	57	67	62.5	68.2	62.2
METER CORR. FACTOR	F		1.001	1.001	1.001	1.001	1.001	1.001
ORIFICE PRESSURE	DH	in.H2O	0.5	0.5	0.5	0.5	0.5	0.5
BAROMETRIC PRESSURE	BP	in.Hg	25.60	25.50	25.55	25.55	25.34	25.2
STD. TEMPERATURE	TR	deg F	77	77	77	77	77	77
REFERENCE METER VOL.	VMR	DScf	3.63	3.84	3.71	3.73	3.77	3.76
CHLORIDE ANALYSIS	CL	mg/l						
BLANK ANALYSIS	BLK	mg/l						
SAMPLE VOLUME	VS	mls	100	100	100	100	100	100
NET TOTAL CHLORIDE	NTCL	mg	0.0	0.0	0.0	0.0	0.0	0.0
HCL CONCENTRATION	C1	gr/DScf	0.000	0.000	0.000	0.000	0.000	0.000
HCL CONCENTRATION	C2	g/DSm3	0.000	0.000	0.000	0.000	0.000	0.000
HCL CONCENTRATION	C3	ppm v/v	0	0	0	0	0	0
STACK GAS FLOWRATE	Q	DScfm						
HCL EMISSION RATE	ER1	lb/hr	0.00	0.00	0.00	0.00	0.00	0.00
HCL EMISSION RATE	ER2	g/s	0.00	0.00	0.00	0.00	0.00	0.00

Dry Standard conditions - 77 deg F, 29.92 in.Hg
25.0 deg C, 101.325 kPa

BOVAR ENVIRONMENTAL-HCL EMISSION CALCULATIONS

CLIENT - RIGO & RIGO
PROJ. # - 5416265
JOBSITE - LAYTON, UTAH
LOCATION - STACK B
DATE - NOV 23 TO NOV 28

TEST #			T19-HCL-A	T20-HCL-B	T21-HCL-A	T22-HCL-B	T23-HCL-A
DATE (1995)			Nov 26	Nov 26	Nov 27	Nov 27	Nov 28
START TIME			11:23	16:17	11:35	16:38	13:17
FINISH TIME			12:23	17:17	12:35	17:38	14:17
INITIAL METER VOLUME		cu ft	0	0	0	0	0
FINAL METER VOLUME		cu ft	4.503	4.347	4.291	4.331	4.319
NET METER VOLUME	VM	cu ft	4.50	4.35	4.29	4.33	4.32
METER TEMPERATURE	TM	deg F	49.5	37.3	54	39.5	46
METER CORR. FACTOR	F		1.001	1.001	1.001	1.001	1.001
ORIFICE PRESSURE	DH	in.H2O	0.5	0.5	0.5	0.5	0.5
BAROMETRIC PRESSURE	BP	in.Hg	25.17	25.17	25.43	25.38	25.29
STD. TEMPERATURE	TR	deg F	77	77	77	77	77
REFERENCE METER VOL.	VMR	DScf	4.00	3.96	3.82	3.96	3.88
CHLORIDE ANALYSIS	CL	mg/l					
BLANK ANALYSIS	BLK	mg/l					
SAMPLE VOLUME	VS	mls	100	100	100	100	100
NET TOTAL CHLORIDE	NTCL	mg	0.0	0.0	0.0	0.0	0.0
HCL CONCENTRATION	C1	gr/DScf	0.000	0.000	0.000	0.000	0.000
HCL CONCENTRATION	C2	g/DSm3	0.000	0.000	0.000	0.000	0.000
HCL CONCENTRATION	C3	ppm v/v	0	0	0	0	0
STACK GAS FLOWRATE	Q	DScfm					
HCL EMISSION RATE	ER1	lb/hr	0.00	0.00	0.00	0.00	0.00
HCL EMISSION RATE	ER2	g/s	0.00	0.00	0.00	0.00	0.00

Dry Standard conditions - 77 deg F, 29.92 in.Hg
25.0 deg C, 101.325 kPa

MISCELLANEOUS

PROJECT DAVIS COUNTY RESOURCE RECOVERY FACILITY
PROJECT No. 5416265
CLIENT RIGO & RIGO

PROCESS CONDITION	DATE	TEST I.D.	TIME START	TIME FINISH	SHEETS COMPLETE	H2O CHECKED	DATA INPUT	ISO'S CHECKED	DRIFT CHECKED	ORGANIC GLASSWARE
AG REAGENT	NOV 17/95	T1-HCL-A	8:15	9:15	Y	Y	Y			
400 deg F		T1-OC-A	09:50	13:15	Y	Y	Y	Y		1
NORMAL OPS		T1-MP-A	13:13	16:58	Y	Y	Y	Y		
		LINEARITIES		12:00	Y		Y			
		T1-CEM-A	11:16	17:08	Y		Y		Y	
		T2-HCL-B	4:45	5:45	Y	Y	Y			
AG REAGENT	NOV 18/95	T3-HCL-A	8:30	9:30	Y	Y	Y			
400 deg F		T2-MP-A	12:02	14:45	Y	Y	Y	Y		
NORMAL OPS		T2-OC-A	10:14	12:50	Y	Y	Y	Y		2
		T2-CEM-A	10:16	15:03	Y		Y		Y	
		T4-HCL-B	15:30	16:30	Y	Y	Y			
		T3-OC-B	15:01	17:59	Y	Y	Y	Y		1
		T3-MP-B	17:23	19:40	Y	Y	Y	Y		
		T3-CEM-B	15:53	19:42	Y		Y		Y	
AG REAGENT	NOV 19/95	T5-HCL-A	8:45	9:45	Y	Y	Y			
400 deg F		T4-MP-A	11:25	13:43	Y	Y	Y	Y		
HIGH CARBON		T4-OC-A	8:36	11:02	Y	Y	Y	Y		2
		T4-CEM-A	9:00	13:46	Y		Y		Y	
		T6-HCL-B	14:59	15:59	Y	Y	Y			
		T5-OC-B	14:54	17:19	Y	Y	Y	Y		1
		T5-MP-B	16:37	18:52	Y	Y	Y	Y		
		T5-CEM-B	14:16	18:54	Y		Y		Y	
		T-BLK-OC1	18:44	18:50	Y	Y				2
NO AG REAGENT	NOV 20/95	T7-HCL-A	9:00	10:00	Y	Y	Y			
NO AC		T6-MP-A	10:48	13:08	Y	Y	Y	Y		
400 deg F		T6-OC-A	9:00	11:18	Y	Y	Y	Y		1
NORMAL OPS		T6-CEM-A	9:37	12:11	Y		Y		Y	
T-07-OC-B		T8-HCL-B	14:34	15:34	Y	Y	Y			
in transition		T7-OC-B	14:32	17:07	Y	Y	Y	Y		2
T07-MP-B		T7-MP-B	16:04	18:57	Y	Y	Y	Y		
LOWER TEMP		T7-CEM-B	14:20	18:53	Y		Y		Y	
AG REAGENT	NOV 21/95	T9-HCL-A	9:10	10:10	Y	Y	Y			
AC HIGH		T8-MP-A	10:54	13:22	Y	Y	Y	Y		
350 deg F		T8-OC-A	8:45	11:30	Y	Y	Y	Y		3
INTERMEDIATE TEMP		T8-CEM-A	9:00	13:27	Y		Y		Y	
		T10-HCL-B	12:30	13:30	Y	Y	Y			
		T9-OC-B	14:10	16:30	Y	Y	Y	Y		4

PROJECT DAVIS COUNTY RESOURCE RECOVERY FACILITY
PROJECT No. 5416265
CLIENT RIGO & RIGO

PROCESS CONDITION	DATE	TEST I.D.	TIME START	TIME FINISH	SHEETS COMPLETE	H2O CHECKED	DATA INPUT	ISO'S CHECKED	DRIFT CHECKED	ORGANIC GLASSWARE
		T9-MP-B	15:39	17:57	Y	Y	Y	Y		
		T9-CEM-B	14:45	18:02	Y		Y		Y	
AG REAGENT	NOV 22/95	T11-HCL-A	12:17	13:17	Y	Y	Y			
AC HIGH		T10-MP-A	9:14	11:45	Y	Y	Y	Y		
300 deg F		T10-OC-A	9:14	11:42	Y	Y	Y	Y		5
MINIMUM TEMP		T10-CEM-A	9:02	11:53	Y		Y		Y	
		T12-HCL-B	17:22	18:22	Y	Y	Y			
		T11-OC-B	14:08	16:39	Y	Y	Y	Y		7
		T11-MP-B	14:08	16:39	Y	Y	Y	Y		
		T11-CEM-B	12:50	17:22	Y		Y		Y	
		B2-OC	17:45	17:48	Y	Y				5
AG REAGENT	NOV 23/95	T13-HCL-A	12:50	13:50	Y	Y	Y			
NO AC		T12-MP-A	9:38	12:14	Y	Y	Y	Y		
300 deg F		T12-OC-A	9:39	12:14	Y	Y	Y	Y		7
MINIMUM TEMP		T12-CEM-A	9:14	12:26	Y		Y		Y	
		T14-HCL-B	17:45	18:45	Y	Y	Y			
		T13-OC-B	14:54	17:17	Y	Y	Y	Y		5
		T13-MP-B	14:54	17:17	Y	Y	Y	Y		
		T13-CEM-B	13:16	17:22	Y		Y		Y	
AG REAGENT	NOV 24/95	T15-HCL-A	11:55	12:55	Y	Y	Y			
AC HIGH		T14-MP-A	8:47	11:17	Y	Y	Y	Y		
350 deg F		T14-OC-A	8:47	11:17	Y	Y	Y	Y		3
INTERMEDIATE TEMP		T14-CEM-A	8:16	10:44	Y		Y		Y	
		T16-HCL-B	17:05	18:05	Y	Y	Y			
		T15-OC-B	14:00	16:40	Y	Y	Y	Y		4
		T15-MP-B	14:00	16:40	Y	Y	Y	Y		
		T15-CEM-B	12:09	16:46	Y		Y		Y	
AG REAGENT	NOV 25/95	T17-HCL-A	12:38	13:38	Y	Y	Y			
AC LOW		T16-MP-A	8:32	12:09	Y	Y	Y	Y		
350 deg F		T16-OC-A	8:32	12:09	Y	Y	Y	Y		3
INTERMEDIATE TEMP		T16-CEM-A	8:18	12:20	Y		Y		Y	
		T18-HCL-B	17:58	18:58	Y	Y	Y			
		T17-OC-B	15:04	17:29	Y	Y	Y	Y		4
		T17-MP-B	15:04	17:29	Y	Y	Y	Y		
		T17-CEM-B	13:12	17:41	Y		Y		Y	
AG REAGENT	NOV 26/95	T19-HCL-A	11:23	12:23	Y	Y	Y			
AC NO		T18-MP-A	8:36	10:56	Y	Y	Y	Y		
350 deg F		T18-OC-A	8:36	10:56	Y	Y	Y	Y		8

PROJECT DAVIS COUNTY RESOURCE RECOVERY FACILITY
PROJECT No. 5416265
CLIENT RIGO & RIGO

PROCESS CONDITION	DATE	TEST I.D.	TIME START	TIME FINISH	SHEETS COMPLETE	H2O CHECKED	DATA INPUT	ISO'S CHECKED	DRIFT CHECKED	ORGANIC GLASSWARE
INTERMEDIATE TEMP		T18-CEM-A	8:18	11:02	Y		Y		Y	
		T20-HCL-B	16:17	17:17	Y	Y	Y			
		T19-OC-B	13:21	15:51	Y	Y	Y	Y		3
		T19-MP-B	13:21	15:51	Y	Y	Y	Y		
		T19-CEM-B	11:34	15:54	Y		Y		Y	
AG REAGENT	NOV 27/95	T21-HCL-A	11:35	12:35	Y	Y	Y			
AC LOW		T20-MP-A	8:47	11:11	Y	Y	Y	Y		
300 deg F		T20-OC-A	8:48	11:11	Y	Y	Y	Y		7
MINIMM TEMP		T20-CEM-A	8:25	11:20	Y		Y		Y	
		T22-HCL-B	16:38	17:38	Y	Y	Y			
		T21-OC-B	12:56	16:14	Y	Y	Y	Y		5
		T21-MP-B	12:56	16:14	Y	Y	Y	Y		
		T21-CEM-B	12:05	16:20	Y		Y		Y	
AG REAGENT	NOV 28/95	T23-HCL-A	13:17	14:17	Y	Y	Y			
AC HIGH		T22-MP-A	9:02	12:36	Y	Y	Y	Y		
300 deg F		T22-OC-A	9:02	12:36	Y	Y	Y	Y		7
MINIMUM TEMP		T22-CEM-A	8:33	12:42	Y		Y		Y	
T-22-OC & MP- A		T23-OC-B	15:17	18:50	Y	Y	Y	Y		5
in transition to intermediate-		T23-MP-B	15:17	18:50	Y	Y	Y	Y		
minimum temp (325 deg F)		T23-CEM-B	14:50	18:55	Y		Y		Y	
T-23-OC & MP-B at intermedite-										
minimum temp (325 deg F)										

PROJECT DAVIS COUNTY RESOURCE RECOVERY FACILITY
PROJECT No. 5416265
CLIENT RIGO & RIGO

PROCESS CONDITION	DATE	TEST I.D.	O2			CO2			CO			SO2			NOx			THC		
			AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN
AG REAGENT	NOV 17/95	T1-HCL-A																		
400 deg F		T1-OC-A																		
NORMAL OPS		T1-MP-A																		
		LINEARITIES																		
		T1-CEM-A	11.3	18.6	5.6	9.1	16.8	1.9	59	651	6	88	380	18	191	266	56	2	17	0
		T2-HCL-B																		
AG REAGENT	NOV 18/95	T3-HCL-A																		
400 deg F		T2-MP-A																		
NORMAL OPS		T2-OC-A																		
		T2-CEM-A **	11.0	14.1	6.3	9.2	14.3	6.1	50	891	0	47	125	0	188	244	45	1	1	1
		T4-HCL-B																		
		T3-OC-B																		
		T3-MP-B																		
		T3-CEM-B	10.9	15.1	6.1	9.0	15.0	5.0	58	1002	13	38	121	4	180	249	112	0	35	0
		** Aveage of 2 sub-tests																		
AG REAGENT	NOV 19/95	T5-HCL-A																		
400 deg F		T4-MP-A																		
HIGH CARBON		T4-OC-A																		
		T4-CEM-A	11.0	14.0	5.3	9.3	15.3	6.6	45	1010	11	50	149	25	200	259	144	1	37	0
		T6-HCL-B																		
		T5-OC-B																		
		T5-MP-B																		
		T5-CEM-B	10.9	14.8	5.5	9.2	14.9	5.2	52	1008	13	40	127	16	182	240	129	1	96	0
		T-BLK-OC1																		
NO AG REAGENT	NOV 20/95	T7-HCL-A																		
NO AC		T6-MP-A																		
400 deg F		T6-OC-A																		
NORMAL OPS		T6-CEM-A	10.3	12.9	6.4	9.5	12.9	2.9	32	91	1	90	292	43	196	291	148	1	1	0
T-07-OC-B		T8-HCL-B																		
in transition		T7-OC-B																		
T07-MP-B		T7-MP-B																		
LOWER TEMP		T7-CEM-B	10.4	13.3	7.0	9.7	13.2	6.9	40	236	15	60	170	27	182	224	25	1	1	0
AG REAGENT	NOV 21/95	T9-HCL-A																		
AC HIGH		T8-MP-A																		
350 deg F		T8-OC-A																		
INTERMEDIATE TEMP		T8-CEM-A	10.2	13.7	6.5	10.0	13.9	6.4	37	78	12	39	87	17	194	243	152	1	3	0
		T10-HCL-B																		
		T9-OC-B																		

PROJECT DAVIS COUNTY RESOURCE RECOVERY FACILITY
PROJECT No. 5416265
CLIENT RIGO & RIGO

PROCESS CONDITION	DATE	TEST I.D.	O2			CO2			CO			SO2			NOx			THC		
			AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN
		T9-MP-B																		
		T9-CEM-B	10.5	14.4	6.1	9.5	14.2	5.9	51	1007	8	31	111	5	172	228	114	0	8	0
AG REAGENT	NOV 22/95	T11-HCL-A																		
AC HIGH		T10-MP-A																		
300 deg F		T10-OC-A																		
MINIMUM TEMP		T10-CEM-A	11.0	13.6	6.2	9.3	14.4	6.9	52	914	13	45	129	5	389	585	122	0	7	0
		T12-HCL-B																		
		T11-OC-B																		
		T11-MP-B																		
		T11-CEM-B	10.7	13.9	6.5	9.5	14.0	6.3	50	893	10	28	66	12	171	233	121	1	10	0
		B2-OC																		
AG REAGENT	NOV 23/95	T13-HCL-A																		
NO AC		T12-MP-A																		
300 deg F		T12-OC-A																		
MINIMUM TEMP		T12-CEM-A	10.6	13.2	6.0	9.6	14.6	7.1	50	995	12	46	183	23	204	261	160	0	40	0
		T14-HCL-B																		
		T13-OC-B																		
		T13-MP-B																		
		T13-CEM-B	10.7	13.6	6.9	9.3	13.2	6.5	36	87	15	41	112	19	212	269	159	1	13	0
AG REAGENT	NOV 24/95	T15-HCL-A																		
AC HIGH		T14-MP-A																		
350 deg F		T14-OC-A																		
INTERMEDIATE TEMP		T14-CEM-A	10.6	13.3	5.4	9.4	15.0	6.8	63	1000	21	48	188	23	195	233	136	0	8	0
		T16-HCL-B																		
		T15-OC-B																		
		T15-MP-B																		
		T15-CEM-B	10.5	13.0	5.0	9.5	15.3	7.1	45	911	14	49	212	17	200	241	153	1	5	0
AG REAGENT	NOV 25/95	T17-HCL-A																		
AC LOW		T16-MP-A																		
350 deg F		T16-OC-A																		
INTERMEDIATE TEMP		T16-CEM-A	10.6	14.2	4.9	9.6	15.6	5.9	72	991	20	50	288	17	275	362	202	1	91	0
		T18-HCL-B																		
		T17-OC-B																		
		T17-MP-B																		
		T17-CEM-B	10.7	13.4	6.5	9.5	14.1	6.9	52	993	12	55	218	17	194	236	156	1	8	0
AG REAGENT	NOV 26/95	T19-HCL-A																		
AC NO		T18-MP-A																		
350 deg F		T18-OC-A																		

PROJECT DAVIS COUNTY RESOURCE RECOVERY FACILITY
PROJECT No. 5416265
CLIENT RIGO & RIGO

PROCESS CONDITION	DATE	TEST I.D.	O2			CO2			CO			SO2			NOx			THC		
			AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN
INTERMEDIATE TEMP		T18-CEM-A	10.0	12.6	4.5	10.1	16.0	7.4	52	993	16	42	183	22	174	223	139	0	65	0
		T20-HCL-B																		
		T19-OC-B																		
		T19-MP-B																		
		T19-CEM-B	10.5	19.1	5.2	9.6	15.4	1.4	97	992	13	32	157	3	170	233	46	1	51	0
AG REAGENT	NOV 27/95	T21-HCL-A																		
AC LOW		T20-MP-A																		
300 deg F		T20-OC-A																		
MINIMM TEMP		T20-CEM-A	10.4	13.6	5.5	9.6	14.9	6.6	43	988	15	42	129	16	192	251	153	0	8	0
		T22-HCL-B																		
		T21-OC-B																		
		T21-MP-B																		
		T21-CEM-B	10.6	19.0	3.8	9.5	16.7	1.5	101	987	16	44	433	1	184	241	43	2	85	0
AG REAGENT	NOV 28/95	T23-HCL-A																		
AC HIGH		T22-MP-A																		
300 deg F		T22-OC-A																		
MINIMUM TEMP		T22-CEM-A	11.0	13.5	6.5	9.1	13.9	6.7	44	987	14	39	259	9	173	230	45	0	8	0
T-22-OC & MP- A		T23-OC-B																		
in transition to intermediate-		T23-MP-B																		
minimum temp (325 deg F)		T23-CEM-B	9.9	12.3	5.5	10.2	15.0	7.9	46	983	16	134	498	23	203	258	127	1	59	0
T-23-OC & MP-B at intermedite-																				
minimum temp (325 deg F)																				

PROJECT DAVIS COUNTY RESOURCE RECOVERY FACILITY
PROJECT No. 5416265
CLIENT RIGO & RIGO

PROCESS CONDITION	DATE	TEST I.D.	VOLUME DSm3	ISO %	MOISTURE %	TEMP Deg C	FLOW DSm3/hr	VELOCITY m/s
AG REAGENT	NOV 17/95	T1-HCL-A						
400 deg F		T1-OC-A	1.8866	104.6	13.9	196.9	48731	20.5
NORMAL OPS		T1-MP-A	2.3087	104.5	13.5	213.9	49643	21.8
		LINEARITIES						
		T1-CEM-A						
		T2-HCL-B						
AG REAGENT	NOV 18/95	T3-HCL-A						
400 deg F		T2-MP-A	2.1459	101.4	13.4	214.0	47528	20.6
NORMAL OPS		T2-OC-A	1.8098	100.0	12.4	202.6	48872	20.6
		T2-CEM-A						
		T4-HCL-B						
		T3-OC-B	1.7526	99.9	12.9	209.0	47418	20.3
		T3-MP-B	2.1273	104.4	12.9	210.1	48066	20.6
		T3-CEM-B						
AG REAGENT	NOV 19/95	T5-HCL-A						
400 deg F		T4-MP-A	2.1884	105.9	13.1	211.0	48735	20.6
HIGH CARBON		T4-OC-A	1.7356	100.9	13.5	204.4	46461	19.8
		T4-CEM-A						
		T6-HCL-B						
		T5-OC-B	1.7278	100.0	12.5	209.2	46668	19.8
		T5-MP-B	2.166	104.1	12.6	212.0	49075	20.9
		T5-CEM-B						
		T-BLK-OC1						
NO AG REAGENT	NOV 20/95	T7-HCL-A						
NO AC		T6-MP-A	2.0636	105.7	11.7	208.5	46056	19.2
400 deg F		T6-OC-A	1.6645	100.4	12.5	202.3	44809	18.7
NORMAL OPS		T6-CEM-A						
T-07-OC-B		T8-HCL-B						
in transition		T7-OC-B	1.6544	101.6	14.1	198.2	43987	18.6
T07-MP-B		T7-MP-B	2.1393	109.3	15.3	183.7	46164	19.1
LOWER TEMP		T7-CEM-B						
AG REAGENT	NOV 21/95	T9-HCL-A						
AC HIGH		T8-MP-A	2.0337	106.2	14.6	174.5	45165	18.3
350 deg F		T8-OC-A	1.6065	106.0	16.4	170.3	40961	16.8
INTERMEDIATE TEMP		T8-CEM-A						
		T10-HCL-B						
		T9-OC-B	1.6657	100.2	14.3	178.2	44904	18.3

PROJECT DAVIS COUNTY RESOURCE RECOVERY FACILITY
PROJECT No. 5416265
CLIENT RIGO & RIGO

PROCESS CONDITION	DATE	TEST I.D.	VOLUME DSm3	ISO %	MOISTURE %	TEMP Deg C	FLOW DSm3/hr	VELOCITY m/s
		T9-MP-B	2.1182	103.7	14.9	181.5	48184	19.9
		T9-CEM-B						
AG REAGENT	NOV 22/95	T11-HCL-A						
AC HIGH		T10-MP-A	2.0021	98.7	16.8	146.8	47840	18.6
300 deg F		T10-OC-A	1.693	100.9	16.9	146.4	45350	17.6
MINIMUM TEMP		T10-CEM-A						
		T12-HCL-B						
		T11-OC-B	1.7072	100.0	16.7	142.3	46096	17.7
		T11-MP-B	2.0208	100.3	17.2	151.1	47512	18.7
		T11-CEM-B						
		B2-OC						
AG REAGENT	NOV 23/95	T13-HCL-A						
NO AC		T12-MP-A	2.029	100.8	16.9	149.7	47463	18.5
300 deg F		T12-OC-A	1.7329	101.4	16.9	148.2	46148	17.9
MINIMUM TEMP		T12-CEM-A						
		T14-HCL-B						
		T13-OC-B	1.7554	103.0	18.2	150.8	46048	18.4
		T13-MP-B	2.0449	100.1	17.8	151.8	48191	19.1
		T13-CEM-B						
AG REAGENT	NOV 24/95	T15-HCL-A						
AC HIGH		T14-MP-A	2.0687	99.2	15.5	175.5	49192	20.1
350 deg F		T14-OC-A	1.7304	100.6	15.7	174.0	46481	19.0
INTERMEDIATE TEMP		T14-CEM-A						
		T16-HCL-B						
		T15-OC-B	1.7369	101.1	16.8	177.7	46431	19.3
		T15-MP-B	2.0018	98.6	16.6	176.6	47909	19.8
		T15-CEM-B						
AG REAGENT	NOV 25/95	T17-HCL-A						
AC LOW		T16-MP-A	2.0896	100.4	16.5	176.2	49109	20.4
350 deg F		T16-OC-A	1.7599	101.4	16.7	176.2	46899	19.5
INTERMEDIATE TEMP		T16-CEM-A						
		T18-HCL-B						
		T17-OC-B	1.6913	99.7	14.8	175.0	45828	18.5
		T17-MP-B	1.9743	97.6	14.8	174.7	47713	19.5
		T17-CEM-B						
AG REAGENT	NOV 26/95	T19-HCL-A						
AC NO		T18-MP-A	1.8754	97.1	15.0	172.0	45555	18.6
350 deg F		T18-OC-A	1.5921	98.1	15.0	171.5	43830	17.8

PROJECT DAVIS COUNTY RESOURCE RECOVERY FACILITY
PROJECT No. 5416265
CLIENT RIGO & RIGO

PROCESS CONDITION	DATE	TEST I.D.	VOLUME DSm3	ISO %	MOISTURE %	TEMP Deg C	FLOW DSm3/hr	VELOCITY m/s
INTERMEDIATE TEMP		T18-CEM-A						
		T20-HCL-B						
		T19-OC-B	1.5912	99.6	16.1	173.1	43100	17.9
		T19-MP-B	1.8573	98.0	16.0	173.9	44719	18.5
		T19-CEM-B						
AG REAGENT	NOV 27/95	T21-HCL-A						
AC LOW		T20-MP-A	2.0254	104.1	20.6	158.5	45907	19.3
300 deg F		T20-OC-A	1.7179	101.7	17.4	158.2	45635	18.4
MINIMM TEMP		T20-CEM-A						
		T22-HCL-B						
		T21-OC-B	1.6607	100.9	16.9	156.6	44469	17.8
		T21-MP-B	1.9765	99.0	16.0	159.5	47080	18.7
		T21-CEM-B						
AG REAGENT	NOV 28/95	T23-HCL-A						
AC HIGH		T22-MP-A	1.9589	105.9	22.7	161.8	43652	19.0
300 deg F		T22-OC-A	1.6567	102.7	18.3	162.3	43561	18.0
MINIMUM TEMP		T22-CEM-A						
T-22-OC & MP- A		T23-OC-B	1.6054	101.7	17.9	165.0	42644	17.6
in transition to intermediate-		T23-MP-B	1.8956	100.1	17.7	165.2	44674	18.4
minimum temp (325 deg F)		T23-CEM-B						
T-23-OC & MP-B at intermedite-								
minimum temp (325 deg F)								

NOVEMBER 17, 1995

HCl METHOD 26 SAMPLING TRAIN
RECOVERY DATA FORM

PROJECT NO.: 5416265

LOCATION: STACK B m TEST #: T1-HCl-A DATE: 95.11.17

Impingers 1 and 2	Impingers 3 and 4
Weigh impingers Empty contents into container and rinse with DI water	Weigh impingers Empty contents into container and rinse with DI water

Container TS1 Impingers 1 and 2 0.1 N H2SO4 Contents and DI Water Rinses	
Final Wt.:	133.2
Initial Wt.:	33.2
Gain:	100.0

Container TS2 Impingers 3 and 4 0.1 N NaOH Contents and DI Water Rinses	
Final Wt.:	1339
Initial Wt.:	339
Gain:	100.0

Mark Liquid Level	✓	Seal and Label	✓

Train Identification	
Train No.:	T1-HCl-A
0.1 N H2SO4 Batch No.:	ZENON
DI Water Batch No.:	ZENON
0.1 N NaOH Batch No.:	ZENON
Train Loaded By:	JA
Recovered By:	JA
Reagent Blank Submitted: Yes ✓	No _____

bp 25.46 in Hg

METHOD 26
HCl SAMPLING DATA FORM

Company Name	[illegible]	Plant Location	[illegible]	Source Name	[illegible]
Test Date	[illegible]	Test Number	[illegible]	Job Number	[illegible]
Sampling for	HCl	Meter Box	[illegible]	B.P. mm/inHg	[illegible]

ABSORBING SOL'N	15 ml 0.1 N H_2SO_4	15 ml 0.1 N H_2SO_4	15 ml 0.1 N NaOH	15 ml 0.1 N NaOH	Silica Gel	GAS	1	2	3	4
WEIGHTS	IMP 1	IMP 2	IMP 3	IMP 4	IMP 5	READINGS				
EMPTY						O2				
FILLED FINAL						C02				
FILLED INITIAL						CO				
DIFFERENCE						TIME				

OPERATOR	[illegible]	Sample Rate (Lpm)	2	H20 Condensed		
Lk.Chk, (Init.)	[illegible] cc/min	Lk. Chk. (Final)	[illegible] cc/min	Probe Purged	(Yes)	No)

Sample Time	Clock Time	Volume Desired	Volume Actual	Vacuum in.Hg	Meter Temp. °C/°F	Probe Temp. °C/°F	Box Temp. °C/°F	Impinger Temp. °C/°F
0	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
10	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
20	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
30	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
40	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
50	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
60	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
70	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
80	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
90	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
100	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
110	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
120	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
		TOTAL OR AVG	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

E:\FORMS\HCL.FRM

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	RIGO & RIGO
Date:	95.11.17	Test:	TI-4CL-A
Sample Location:	#1 STACK B	Filter I.D.:	NA
Pre Weights by:	JM	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	EMPTY	96.2	86.1	10.1 ✓
2	15ml .1N H_2SO_4	96.8	94.9	1.9 ✓
3	15ml .1N H_2SO_4	105.7	105.4	0.3 ✓
4	EMPTY	77.0	70.9	+ 6.1 ✓
5	15ml .1N NaOH	92.8	98.7	- 5.9 ✓
6	SILICA GEL	124.6	123.6	1.0 ✓
~~7~~				
~~8~~				
~~XAD Trap~~				
			Total (g)	13.5g ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights	147.5	147.6		JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.17

SYSTEM CALIBRATION AND DRIFT CALCULATIONS

CLIENT	RIGO+RIGO	DATE	NOV17/95
PROJECT NUMBER	5416265	TIME START	11:16
SAMPLE LOCATION	STACK	TIME FINISH	17:08
	TEST NUMBER	T1CEMA	

INSTRUMENT SPAN VALUES

OXYGEN	25	%	CARBON DIOXIDE	20	%
SULPHUR DIOXIDE	1000	PPM	CARBON MONOXIDE	1000	PPM
NITROGEN OXIDES	1000	PPM	TOTAL HYDROCARBONS	100	PPM

ITEM	CAL.GAS VALUE	ANAL. CAL.	INITIAL VALUES SYSTEM CAL.	SYSTEM CAL. BIAS (% SPAN)	FINAL VALUES SYSTEM CAL.	SYSTEM CAL. BIAS (% SPAN)	DRIFT (% SPAN)
O2 ZERO	0	0.04	0.04	0.0	-0.03	-0.3	-0.3
O2 SPAN	9.91	9.85	9.85	0.0	9.63	-0.9	-0.9
SO2 ZERO	0	-0.3	2.2	0.3	-22.8	-2.3	-2.5
SO2 SPAN	149	151	146	-0.5	130	-2.1	-1.6
NOX ZERO	0	-0.8	-2	-0.1	11.60	1.2	1.4
NOX SPAN	302	308	307	-0.1	318	1.0	1.1
CO2 ZERO	0	0.03	0.06	0.2	0.07	0.2	0.1
CO2 SPAN	7	7.07	7.05	-0.1	7.18	0.5	0.6
CO ZERO	0	0.1	1	0.1	0.97	0.1	-0.0
CO SPAN	100	98.4	99.7	0.1	99.2	0.1	-0.1
THC ZERO	0	0.12	0.94	0.8	0.7	0.6	-0.2
THC SPAN	20	21.4	22.5	1.1	25.3	3.9	2.8

DRIFT CRITERIA <5% SPAN
BIAS CRITERIA <5% SPAN

SUMMARY CORRECTED DATA

CLIENT	RIGO+RIGO	DATE	NOV17/95
PROJECT NUM.	5416265	TIME START	11:16
LOCATION	STACK	TIME FINISH	13:16

TEST NUMBER T1CEMA1

TIME	O2	CO2	CO	SO2	NOx	THC
	%	%	PPM	PPM	PPM	PPM
13:15:01	9.16	10.93	49.8	120.0	205.9	
13:15:03	9.22	10.80	50.0	122.6	207.2	
13:15:05	9.36	10.65	49.8	123.7	208.1	
13:15:07	9.48	10.53	50.1	124.0	208.8	
13:15:09	9.58	10.40	49.7	123.7	209.4	
13:15:11	9.72	10.30	57.6	122.9	209.7	
13:15:13	9.78	10.21	57.9	122.2	209.7	
13:15:15	9.78	10.16	57.8	121.8	209.7	
13:15:17	9.68	10.19	54.9	122.2	209.5	
13:15:19	9.51	10.35	55.1	123.2	209.5	
13:15:21	9.36	10.55	57.6	124.6	209.4	
13:15:23	9.28	10.69	57.8	126.1	209.4	
13:15:25	9.28	10.75	55.1	127.2	209.4	
13:15:27	9.28	10.71	57.8	127.8	209.4	
13:15:29	9.36	10.65	57.7	127.8	209.4	
13:15:31	9.45	10.56	57.8	127.3	209.2	
13:15:33	9.58	10.46	57.7	126.1	209.1	
13:15:35	9.72	10.34	57.7	124.5	208.8	
13:15:37	9.85	10.22	58.1	122.6	208.4	
13:15:39	9.94	10.11	55.2	120.5	208.0	
13:15:41	10.04	10.00	56.8	117.8	207.2	
13:15:43	10.13	9.92	56.8	115.2	206.6	
13:15:45	10.21	9.86	56.8	112.7	205.9	
13:15:47	10.24	9.80	54.3	110.0	205.3	
13:15:49	10.30	9.76	56.7	107.5	204.5	
13:15:51	10.40	9.72	50.7	105.1	203.7	
13:15:53	10.44	9.67	50.6	102.9	203.0	
13:15:55	10.47	9.62	50.6	100.7	202.4	
13:15:57	10.53	9.58	50.9	98.6	201.8	
13:15:59	10.53	9.54	50.6	96.6	201.1	
13:16:01	10.59	9.49	41.7	94.8	200.3	
Average	10.8	9.2	38	122	204	2
Maximum	12.9	14.4	99	380	266	3
Minimum	6.0	7.2	11	55	169	1

SUMMARY CORRECTED DATA

CLIENT	RIGO+RIGO	DATE	NOV17/95
PROJECT NUM.	5416265	TIME START	13:16
LOCATION	STACK	TIME FINISH	15:16

TEST NUMBER T1CEMA2

TIME	O2	CO2	CO	SO2	NOx	THC
	%	%	PPM	PPM	PPM	PPM
15:15:13	10.89	9.06	48.9	67.2	195.4	1.8
15:15:15	10.79	9.03	48.9	69.4	195.8	1.8
15:15:17	10.52	9.16	49.0	73.5	196.1	1.8
15:15:19	10.20	9.51	49.1	79.2	196.3	1.8
15:15:21	9.94	9.90	49.7	85.3	196.6	2.0
15:15:23	9.84	10.15	49.9	90.8	196.8	1.8
15:15:25	9.81	10.20	47.3	95.6	197.1	1.8
15:15:27	9.84	10.14	49.9	99.3	197.3	2.0
15:15:29	9.87	10.04	50.1	102.0	197.6	1.8
15:15:31	9.90	9.97	58.0	103.6	197.9	1.8
15:15:33	9.91	9.95	58.0	104.7	198.2	1.8
15:15:35	9.90	9.97	58.0	105.2	198.5	1.8
15:15:37	9.87	9.98	57.9	105.2	198.6	1.7
15:15:39	9.90	10.00	58.1	104.5	198.9	1.9
15:15:41	9.93	9.98	60.8	103.6	199.2	1.7
15:15:43	10.04	9.93	58.8	102.1	199.2	1.7
15:15:45	10.17	9.82	61.0	100.4	199.0	1.9
15:15:47	10.33	9.69	61.0	98.3	198.5	1.7
15:15:49	10.49	9.54	61.2	95.9	197.9	1.7
15:15:51	10.65	9.38	55.2	93.2	197.3	1.7
15:15:53	10.75	9.23	58.2	90.7	196.4	1.7
15:15:55	10.82	9.12	57.8	88.2	195.7	1.7
15:15:57	10.75	9.10	57.8	86.2	195.0	1.9
15:15:59	10.68	9.17	58.2	84.6	194.4	1.7
15:16:01	10.62	9.30	50.0	83.6	193.8	1.7
Average	12.1	8.0	90	72	165	3
Maximum	18.6	14.8	651	352	230	17
Minimum	5.6	1.9	17	18	56	2

SUMMARY CORRECTED DATA

CLIENT	RIGO+RIGO	DATE	NOV17/95
PROJECT NUM.	5416265	TIME START	15:16
LOCATION	STACK	TIME FINISH	17:08

TEST NUMBER T1CEMA3

TIME	O2	CO2	CO	SO2	NOx	THC
	%	%	PPM	PPM	PPM	PPM
17:07:03	11.25	8.84	40.5	52.8	206.9	0.4
17:07:05	11.28	8.83	42.8	52.6	206.9	0.3
17:07:07	11.32	8.80	42.8	52.6	206.9	0.3
17:07:09	11.39	8.72	42.7	52.5	206.6	0.3
17:07:11	11.42	8.64	40.9	52.3	206.4	0.5
17:07:13	11.45	8.58	41.0	52.2	206.2	0.3
17:07:15	11.42	8.59	38.4	52.1	206.2	0.3
17:07:17	11.42	8.62	40.9	51.8	206.1	0.5
17:07:19	11.46	8.62	40.9	51.4	206.0	0.3
17:07:21	11.55	8.58	39.8	51.0	205.7	0.3
17:07:23	11.64	8.47	39.8	50.4	205.0	0.3
17:07:25	11.74	8.35	39.7	50.0	204.4	0.3
17:07:27	11.77	8.25	39.8	49.5	203.8	0.5
17:07:29	11.74	8.24	37.3	49.2	203.3	0.3
17:07:31	11.65	8.31	39.9	49.0	203.0	0.5
17:07:33	11.48	8.47	40.1	49.2	203.3	0.5
17:07:35	11.32	8.68	39.8	49.5	204.1	0.3
17:07:37	11.06	8.92	40.0	50.2	205.3	0.3
17:07:39	10.80	9.16	39.8	51.0	207.4	0.3
17:07:41	10.60	9.42	41.0	52.2	209.7	0.3
17:07:43	10.51	9.61	41.2	53.0	212.2	0.3
17:07:45	10.47	9.68	40.9	53.8	214.6	0.3
17:07:47	10.53	9.63	41.0	54.3	216.8	0.5
17:07:49	10.63	9.52	40.7	54.6	218.8	0.3
17:07:51	10.73	9.39	49.0	54.7	220.5	0.3
17:07:53	10.73	9.31	49.1	54.9	222.1	0.3
17:07:55	10.66	9.32	48.7	55.2	223.7	0.3
17:07:57	10.57	9.41	46.4	55.4	225.0	0.3
17:07:59	10.51	9.53	48.8	55.9	226.5	
17:08:01	10.44	9.61	53.1	56.2	227.8	
17:08:03	10.38	9.69	55.9	56.7	228.9	
17:08:05	10.41	9.69	58.2	57.0	230.0	
Average	10.9	10.1	48	71	203	1
Maximum	14.8	16.8	618	291	262	6
Minimum	5.7	6.7	6	35	131	0

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 17
RUN : T1-MP-A
LOC. : STACK B

RUN TIME : 13:13 TO 16:58

METALS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
METALS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	2.3087 DSm3	81.524 DScf
AVERAGE ISOKINETICITY	104.5 %	

FLUE GAS CHARACTERISTICS

MOISTURE	13.48 %	
TEMPERATURE	213.9 deg C	417.0 deg F
FLOW	49643 DSm3/hr	29219 DScfm
	111458 Am3/hr	65602 Acfm
VELOCITY	21.75 m/s	4281.9 fpm

GAS ANALYSIS	O2	11.30 %
	CO2	9.10 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.02 g/gmole D.B.
	MOL. WT.	28.40 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 17
RUN : T1-MP-A
LOC. : STACK B

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	85.4 kPa	25.20 in.Hg
STATIC PRESSURE	-149.4 Pa	-0.60 in.H2O
NOZZLE DIAMETER	6.35 mm	0.2500 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	132.6 g
CONDENSATION IN IMPINGER 2	83.0 g
CONDENSATION IN IMPINGER 3	24.1 g
CONDENSATION IN IMPINGER 4	4.4 g
CONDENSATION IN IMPINGER 5	2.3 g
CONDENSATION IN IMPINGER 6	0.2 g
SILICA GEL WEIGHT GAIN	18.1 g
TOTAL MOISTURE GAIN	264.7 g

METALS COLLECTION

FILTER METALS	0.0000 mg
WASHINGS METALS	0.0000 mg
IMPINGER METALS	0.0000 mg
TOTAL METALS	0.0000 mg

TOTAL SAMPLING TIME 120.0 min.

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 17
RUN : T1-MP-A
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	416	0.840	2.00	804.22	81	232	249	53	1.0	1.0	104.3
1	3.0	416	0.840	2.00	806.55	83	236	249	51	1.0	1.0	106.2
2	6.0	416	0.860	2.10	808.93	84	238	250	50	1.0	2.0	106.5
2	9.0	417	0.940	2.30	811.35	84	239	254	50	1.0	2.0	104.1
3	12.0	415	0.800	1.80	813.82	84	240	252	50	1.0	3.0	108.4
3	15.0	413	0.830	1.90	816.20	84	240	256	48	1.0	3.0	105.0
4	18.0	416	1.100	2.60	818.55	84	240	257	48	1.0	4.0	106.7
4	21.0	417	1.000	2.50	821.29	85	241	256	48	1.0	4.0	106.8
5	24.0	418	1.100	2.50	823.91	86	242	256	47	1.0	5.0	105.7
5	27.0	419	1.100	2.45	826.63	86	242	253	47	1.0	5.0	110.4
6	30.0	419	1.000	2.40	829.47	86	242	255	47	1.0	6.0	107.2
6	33.0	419	1.200	2.80	832.10	86	242	255	46	1.0	6.0	102.1
7	36.0	433	1.200	2.90	834.84	83	238	261	44	1.0	7.0	107.7
7	39.0	433	1.200	2.85	837.69	82	239	264	43	1.0	7.0	107.8
8	42.0	434	1.200	2.80	840.54	82	240	260	43	1.0	8.0	116.1
8	45.0	433	1.100	2.60	843.61	83	240	257	45	1.0	8.0	104.0
9	48.0	433	1.000	2.40	846.25	83	240	256	46	1.0	9.0	105.3
9	51.0	432	1.000	2.30	848.80	84	240	255	46	1.0	9.0	104.3
10	54.0	424	0.760	1.80	851.33	84	240	255	47	1.0	10.0	105.3
10	57.0	423	0.770	1.80	853.57	84	239	255	47	1.0	10.0	103.6
	60.0				855.79							
TRAVERSE NO. 2												
1	0.0	414	0.730	1.80	856.91	82	238	261	51	1.0	1.0	108.6
1	3.0	415	0.790	1.80	859.18	83	237	265	45	1.0	1.0	106.5
2	6.0	419	0.810	1.90	861.50	85	238	270	44	1.0	2.0	104.2
2	9.0	413	0.780	1.60	863.80	85	239	273	44	1.0	2.0	102.9
3	12.0	409	0.760	1.50	866.04	85	240	274	45	1.0	3.0	99.4
3	15.0	412	0.760	1.50	868.18	86	240	277	45	1.0	3.0	103.6
4	18.0	416	0.720	1.40	870.41	86	241	280	46	1.0	4.0	102.8
4	21.0	415	0.700	1.30	872.56	86	244	271	46	1.0	4.0	93.1
5	24.0	417	0.820	1.90	874.48	86	249	246	46	1.0	5.0	102.4
5	27.0	420	0.800	1.80	876.76	87	246	242	46	1.0	5.0	101.4
6	30.0	422	1.100	2.60	878.99	87	246	239	46	1.0	6.0	101.9
6	33.0	424	1.200	2.75	881.61	87	246	240	46	1.0	6.0	99.6
7	36.0	424	0.900	2.20	884.28	87	249	242	46	1.0	7.0	103.2

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 17
RUN : T1-MP-A
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.
7	39.0	421	1.000	2.50	886.68	88	246	239	47	1.5	7.0
8	42.0	416	0.900	2.20	889.28	88	245	239	45	1.5	8.0
8	45.0	406	0.850	1.80	891.68	88	244	239	44	1.5	8.0
9	48.0	397	0.650	1.20	894.07	88	244	239	44	1.5	9.0
9	51.0	396	0.730	1.40	896.13	87	243	239	44	1.5	9.0
10	54.0	389	0.630	1.10	898.30	87	243	240	44	1.5	10.0
10	57.0	389	0.630	1.20	900.33	87	242	243	44	1.5	10.0
	60.0				902.36						
		417	0.894	2.06		85	241	254	46	1.1	

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT	: RIGO & RIGO	DATE	: 9.17.95
JOBSITE	: LAYTON UTAH	RUN	: T1-OCA
REF.No.	: 5416265	LOC.	: STACK B

RUN TIME : 9:50 TO 13:15

ORGANICS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
ORGANICS EMISSION RATE	0.000 mg/s	0.00 gr/hr *
SAMPLE GAS VOLUME	1.8866 DSm3	66.617 DScf
AVERAGE ISOKINETICITY	104.6 %	

FLUE GAS CHARACTERISTICS

MOISTURE	13.93 %	
TEMPERATURE	196.9 deg C	386.4 deg F
FLOW	48731 DSm3/hr	28682 DScfm
	105114 Am3/hr	61868 Acfm
VELOCITY	20.51 m/s	4038.2 fpm

GAS ANALYSIS	O2	11.30 %
	CO2	9.10 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.02 g/gmole D.B.
	MOL. WT.	28.35 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT	: RIGO & RIGO	DATE	: 9.17.95
JOBSITE	: LAYTON UTAH	RUN	: T1-OCA
REF.No.	: 5416265	LOC.	: STACK B

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.2 kPa	25.44 in.Hg
STATIC PRESSURE	-124.5 Pa	-0.50 in.H2O
NOZZLE DIAMETER	5.79 mm	0.2280 in.
PITOT COEFFICIENT	0.796	
METER CORRECTION FACTOR	0.983	

CONDENSATE COLLECTION

RESIN TRAP CONDENSATE	2.1 g
CONDENSATION IN IMPINGER 1	177.6 g
CONDENSATION IN IMPINGER 2	10.3 g
CONDENSATION IN IMPINGER 3	12.8 g
CONDENSATION IN IMPINGER 4	3.1 g
SILICA GEL WEIGHT GAIN	18.8 g
TOTAL MOISTURE GAIN	224.7 g

ORGANICS COLLECTION

FILTER ORGANICS	0.0000 mg
WASHINGS ORGANICS	0.0000 mg
RESIN ORGANICS	0.0000 mg
IMPINGER ORGANICS	0.0000 mg
TOTAL ORGANICS	0.0000 mg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 9.17.95
RUN : T1-OCA
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.
TRAVERSE NO. 1												
1	0.0	390	0.860	1.50	26.81	78	240	248	45	46	5.0	1.0
1	3.0	410	0.860	1.50	28.82	79	240	255	56	50	7.0	1.0
2	6.0	408	0.780	1.20	30.80	81	242	256	55	49	6.5	2.0
2	9.0	406	0.780	1.20	32.73	81	245	257	57	49	6.6	2.0
3	12.0	410	0.860	1.50	34.65	83	245	258	57	49	7.0	3.0
3	15.0	405	0.860	1.40	36.71	84	245	260	57	50	7.0	3.0
4	18.0	405	0.900	1.50	38.75	84	245	260	57	50	7.0	4.0
4	21.0	404	0.880	1.40	40.85	84	245	260	56	51	7.0	4.0
5	24.0	403	1.100	1.80	42.93	84	244	260	56	52	8.2	5.0
5	27.0	403	1.100	1.70	45.30	84	246	260	57	52	8.0	5.0
6	30.0	404	0.920	1.50	47.52	84	245	260	57	52	7.0	6.0
6	33.0	380	0.920	1.50	49.63	84	247	250	60	53	7.2	6.0
7	36.0	355	0.880	1.30	51.64	85	246	240	62	52	7.0	7.0
7	39.0	350	0.880	1.30	53.73	85	245	239	62	52	7.0	7.0
8	42.0	324	0.920	1.60	55.75	85	246	245	62	52	7.8	8.0
8	45.0	300	0.900	1.70	57.87	86	246	244	64	53	8.0	8.0
9	48.0	300	0.840	1.50	60.12	87	246	242	65	53	8.0	9.0
9	51.0	300	0.840	1.40	62.28	87	244	244	65	53	7.2	9.0
10	54.0	300	0.800	1.30	64.39	88	245	245	65	53	7.0	10.0
10	57.0	290	0.800	1.40	66.40	88	245	238	65	53	7.0	10.0
	60.0				68.41							
TRAVERSE NO. 2												
1	0.0	394	0.640	1.10	70.20	81	240	247	52	53	5.0	1.0
1	3.0	398	0.640	1.10	72.01	81	242	269	50	49	5.0	1.0
2	6.0	400	0.600	0.85	73.87	82	243	268	51	48	4.0	2.0
2	9.0	406	0.680	1.00	75.55	83	244	267	52	48	5.0	2.0
3	12.0	412	0.940	1.40	77.36	84	244	265	52	47	5.5	3.0
3	15.0	414	0.940	1.50	79.90	85	245	265	54	46	6.0	3.0
4	18.0	416	0.940	1.50	81.53	86	245	265	55	47	6.0	4.0
4	21.0	418	0.980	1.60	83.66	86	246	265	55	47	6.0	4.0
5	24.0	415	0.940	1.50	85.85	87	247	265	57	48	6.0	5.0
5	27.0	417	0.900	1.40	87.99	88	247	265	59	49	6.0	5.0
6	30.0	415	0.860	1.30	90.07	88	248	265	59	49	5.8	6.0
6	33.0	416	0.860	1.30	92.07	88	246	260	60	50	5.8	6.0
7	36.0	414	0.840	1.30	94.08	89	248	260	60	50	5.8	7.0

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 9.17.95
RUN : T1-OCA
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.
7	39.0	414	0.840	1.30	96.07	89	246	260	62	50	5.8	7.0
8	42.0	409	0.920	1.40	98.09	89	246	260	62	50	6.0	8.0
8	45.0	406	0.860	1.35	100.19	89	246	260	62	51	6.0	8.0
9	48.0	395	0.660	1.00	102.28	90	246	260	62	51	5.0	9.0
9	51.0	392	0.660	1.00	104.04	90	246	260	62	52	5.0	9.0
10	54.0	384	0.600	0.90	105.82	90	247	260	63	52	4.8	10.0
10	57.0	375	0.600	0.95	107.50	90	247	260	63	52	5.0	10.0
	60.0				109.21							
		386	0.835	1.35		85	245	257	58	50	6.3	

ISOKINETIC TEST DATA FORM

Sample Type: Organics Reference Method: EPA M23 Page 1 of 5

Client:	Rigo + Rigo	City, Province:	Layton, UTAH
Project Number:	5416265	Test Number:	TI-OC A
Sample Location:	B Stack	Date:	Nov 17/95
Start Time:	9:50	Finish Time:	1:15
Barometric Press. (in Hg):	~~25.34~~ 25.44	Stack Press(in H_2O): + or -:	-0.50
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes No ✓

Sample Box Number:	T1	Gas Meter Factor:	.983	Calibration Date:	Sept 19/95
Nozzle I.D.:	T1-2	Nozzle Diameter (in.):	0.228	Calibration Date:	Nov 16/95
Probe I.D.:	T27	Pitot Coefficient:	0.796	**Calibration Date:**	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): ( ) O_2 (%): ( ) CO (ppm): _____ Other: _____

Impinger 1 (g)	177.6	Assumed H_2O (%):	12
Impinger 2 (g)	10.3	Filter I.D. #:	—
Impinger 3 (g)	12.6	Net Filter Wt. (g):	—
Impinger 4 (g)	3.1	Net Probe Wash Wt. (g):	—
Impinger 5 (g) (SG)	18.8	Imp. Residue Wt. (g):	—
~~Impinger 6 (g)~~ Col	0.0		
XAD-2 Trap (g)	2.1		
Total H_2O Condensed (g)	224.7		

Sampling Comments: Train 01

Process Rate: _____

Control Equipment Operation: _____

Process Comments: Soot Blowing on B-stack @ 9:35 - 9:50

Signature: _____ Date: Nov 17/95

MOISTURE ANALYSIS DATA SHEET

Project #:	541 - 6265	Client:	Rigo + Rigo
Date:	Nov 17/95	Test:	T1 - OCA
Sample Location:	B - STACK	Filter I.D.:	—
Pre Weights by:	RB	Post Weights by:	HVB

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	BLANK	602.2	424.6	177.6
2	Δ + 100 mls RODI H₂O	613.6	603.3	10.3
3	Δ + 100 mls RODI H₂O	569.4	556.6	12.8
4	BLANK	486.2	483.1	3.1
5	SILICA GEL	791.9	773.1	18.8
~~6~~				
~~7~~				
8 COIL		280.7	280.7	0.0
XAD Trap		344.2	342.1	2.1
			Total (g)	224.7

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: S.6 20% spent Train 01

Signature: [signature]

Date: Nov 17/95

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BOVAR-CONCORD Environmental

DATE: 7/15/95 SAMPLING TRAINS DATA SHEET PAGE 2 OF 9

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: HWB

Run #: J1-OCA Traverse #: 1 Traverse Direction: East (Blue) Start Time: 9:50 Finish Time: _____

Pt. (all)	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.86	1.5	.678	26.98	390	240	248	46	45	78	77	5.0
	3		0.86	1.5	.678	28.82	410	240	255	50	56	80	78	2.0
2	6		0.78	1.2	.646	30.80	408	242	256	49	55	82	79	6.5
	9		0.78	1.2	.646	32.73	406	245	257	49	57	84	78	6.6
3	12		0.86	1.5	.678	34.65	410	245	258	49	57	86	79	2.0
	15		0.86	1.4	.678	36.71	405	245	260	49	57	87	80	2.0
4	18		0.90	1.5	.694	38.75	405	245	260	50	57	88	80	2.0
	21		0.88	1.4	.686	40.85	404	245	260	50	56	88	80	2.0
5	24		1.1	1.8	.767	42.93	403	244	260	51	56	88	80	8.2
	27		1.1	1.7	.767	45.30	403	246	260	52	57	88	80	8.0
6	30		0.92	1.5	.701	47.52	404	245	260	52	57	88	80	2.0
	33		0.92	1.5	.712	49.63	380	247	250	52	60	88	80	2.2

Pre test leak check: Rate (cfm) 0.006 at 15 inches Hg (Vacuum) Leak Volume Start: 25.98 Leak Volume End: 26.84

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 7/11/95

SAMPLING TRAINS DATA SHEET

Client: Rust Rigs | Project #: 5416265 | Sample Location: B Stack | Operators: HVB

Run #: TI-CCA | Traverse #: 1 | Traverse Direction: East | Start Time: _____ | Finish Time: 10:50

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH) 1.3	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	36		0.88	~~1.3~~	.707	51.64	355	246	240	53	62	89	81	2.0
	39		0.88	1.3	.707	53.23	350	245	239	52	62	89	81	2.0
8	42		0.92	1.6	.734	55.25	324	246	245	52	62	89	81	2.8
	45		0.92	1.7	.758	57.27	300	246	244	52	64	90	82	3.0
9	48		0.84	1.5	.713	60.12	300	246	242	53	65	91	83	2.0
	51		0.84	1.4	.713	62.28	300	244	244	53	65	91	83	2.2
10	54		0.80	1.3	.696	64.39	300	245	245	53	65	92	84	2.0
	57		0.80	1.4	.696	66.40	290	245	238	53	65	92	84	2.0
	60					68.41								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.02 at 16 inches Hg (Vacuum) Leak Volume Start: 68.41 Leak Volume End: 68.88

K value calculated by: _____ Checked by: _____ Operator Signature: _____

DATE: 12/16/95 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: HVB

Run #: T1-OCA Traverse #: 2 Traverse Direction: North (Red) Start Time: 12:15 Finish Time: _____

Pt. (For Wall)	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.64	1.1	.585	70.220	394	240	247	53	52	81	80	5.0
	3		0.64	1.1	.585	72.01	398	242	269	49	50	81	80	5.0
2	6		0.60	0.85	.566	73.87	400	243	208	48	51	83	81	4.2
	9		0.68	1.0	.603	75.65	406	244	267	48	52	85	81	5.0
3	12		0.94	1.4	0.709	77.36	412	244	265	47	52	86	81	5.8
	15		0.94	1.5	0.709	79.40	414	245	265	46	54	83	81	6.0
4	18		0.94	1.5	0.709	81.53	416	245	265	47	55	90	82	6.0
	21		0.98	1.6	.724	83.66	418	246	265	47	55	90	82	6.2
5	24		0.94	1.5	.709	85.85	415	247	265	48	57	91	82	6.0
	27		0.90	1.4	.694	87.99	417	247	265	49	59	92	83	6.0
6	30		0.86	1.3	.678	90.07	415	248	265	49	59	92	83	5.8
	33		0.86	1.3	.678	92.07	416	246	260	50	60	92	83	5.8

Pre test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 68.93 Leak Volume End: 70.17

Post test leak check: Rate (cfm) ~~0.02~~ at ~~15~~ 10 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 12/11/95 SAMPLING TRAINS DATA SHEET PAGE 9 OF 5

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: HVB

Run #: TI-OCA Traverse #: 2 Traverse Direction: North Start Time: _____ Finish Time: 1115

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.84	1.3	.670	94.08	414	248	260	50	60	93	84	5.8
	39		0.84	1.3	.670	96.07	414	246	260	50	62	93	84	5.8
8	42		0.92	1.4	.701	98.09	409	246	260	50	62	93	85	6.0
	45		0.86	1.35	.678	100.19	406	246	260	51	62	93	85	6.0
9	48		0.66	1.0	.594	102.28	395	241	260	51	62	94	86	5.0
	51		0.66	1.0	.594	104.04	392	246	266	52	62	94	86	5.0
10	54		0.60	0.9	.576	105.82	380	247	260	52	63	94	86	4.8
	57		0.60	0.95	.575	107.50	375	247	260	52	63	94	86	5.0
	60					109.21								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) <0.02 at 15 inches Hg (Vacuum) Leak Volume Start: 109.21 Leak Volume End: 109.71

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: Nov 17 '95 TEST TI-OCA

Client: Rigo & Rigo Layton, UTAH Location: B Stack Operator: HVB

Sample Type: Organics Reference Method: EPA M23

Modifications: Train rinse acetone/DCM followed by toluene

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	0.96 in H_2O
Static positive or negative	⟷	-0.55 in H_2O
Average Temperature	⟷	426 °F
Estimate % H_2O	⟷	10%
How estimated?	⟷	Moisture Train
Estimate Gas Composition	⟷	O_2% 10 CO_2(%) 7 CO(ppm) 40
How Estimated?	⟷	CEM (O_2 + CO) → (O_2 previous report
Proper nozzle selected?	✓	
K factor	⟷	0.714 at 427 °F
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?	✓	
Mercury		
Aneroid		
Other watch	✓	
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5416265 DATE: Nov 17/95 TEST T1-OCA

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	—	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type	K	
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 5416265 DATE: Nov 17/95 TEST TI-OCA

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	Empty
#2	⟷	~~Empty~~ RODI H_2O
#3	⟷	~~Empty~~ RODI H_2O
#4	⟷	Empty
#5	⟷	Silica Gel
~~#6~~	⟷	—
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	⟷	None
Grease used on joints	X	No
Silica gel type	⟷	
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate	⟷	0.006 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	Good (Fresh)
Leak checks at port changes Before	⟷	<0.02 cfm@ 15 "Hg
After	⟷	0.01 cfm@ 15 "Hg
Final leak race acceptable	⟷	<0.02 cfm@ 15 "Hg
General comments on sampling technique	⟷	None
Sample recovery performed on-site?	✓	Recovery Trailer
Sample recovery performed by	⟷	RB / JA
Clean-up area - General Environment	⟷	Clean
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass	X	

PROJECT # 3416265 DATE: Nov 17/95 TEST TI-OCA

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	⟷	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass	X	cleaned foil + zip bag
plastic		
Balance Type	⟷	Top Loader
Calibrated or QC checked	⟷	Actual 147.5 (g) Measured 147.6 (g)
		295.0 295.1
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour	✓	blue
Weighed	✓	
Filter Handling		
Tweezers used?	✓	teflon
Condition?		Good
Colour of Filter		Off white.
Foil Wrapped?	✓	
Probe Rinses	✓	
Acetone / DCM	✓	
Other		
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

#1

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: B- STACK TEST #: T1-OCA DATE: Nov 17/95 PROJECT NO.: 541-6265

Nozzle, Probe Liner Front Half Filter Holder	Filter	Back Half Filter Holder and Condenser Coil	XAD Resin	Impingers & ~~HPLC~~ Rinse RCD2	Back Half Rinse
Wash and brush 3x each with ~~hexane~~ DCM and acetone. Rinse 3x with with ~~hexane~~ DCM and acetone.	Remove and place on pre-cleaned foil ~~foil in half and~~ place in ~~petri dish~~. Zip Loc bag	**Weigh Coil & Record Weight** Soak 5 minutes each with ~~hexane~~ DCM and acetone. Rinse 3x with ~~hexane~~ DCM and acetone. F = 280.4 I = 280.7	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil. Final wt. = 344.2 Initial wt. = 342.1	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into #4 container. Rinse 3x with ~~HPLC~~ RCD2 water. 'u' tubes	Rinse back half filter holder, condenser and impingers 1, 2 and 3 ~~1-4~~ 3x with ~~hexane~~ DCM and acetone. 'u' tubes
Proof c toluene		Proof c toluene		Proof c toluene.	Proof c toluene.

Container TS1 Front Half Acetone DCM ~~Hexane~~ Rinse	
Final Wt:	452.3
Initial Wt:	262.5
Gain:	

Container TS2 Filter	
Filter ID:	T1-OCA
Colour:	off white fine black specks

Container TS3 Back Half Filter and Condenser Coil	
Final Wt:	421.9
Initial Wt:	262.0
Gain:	0
Colour:	Clear

Container TS4 XAD Resin	
in Zip-Loc bag	

Wrap in Foil	
XAD:	046642
Colour:	White

TRAP # 26

Container TS5 Impinger Contents 1 of 2	
Final Wt:	691.4
Initial Wt:	261.6
Gain:	429.5
Colour:	Colourless

Container TS6 Back Half Rinse	
Final Wt:	422.6
Initial Wt:	262.2
Gain:	60.4
Colour:	

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	01
~~HPLC~~ RCD2 Batch No.:	ZENON 95/10/26
Acetone Batch No.:	CALEDON 14123
~~Hexane~~ DCM Batch No.:	CALEDON 16700
Filter Batch No.:	ZENON 95/10/26 XAD No.: 26
Train Assembled By:	NL
Train Recovered By:	RB

Reagent Blanks Collected?	+ Blank filter
Combined Acetone/~~Hexane~~ DCM	No
~~Combined Glycol~~/Water	No
Blank Train Collected?	No
Comments:	

TS5 2 of 2
Final 518.5
Initial 262.4
Gain 256.1
Colour Colourless

TS7 Proof Toluene (Composite)
Final = 370.1
Initial Volume = 262.6
107.5

EPSREC.DRW-May 95

BOVAR-CONCORD Environmental

ISOKINETIC TEST DATA FORM

Sample Type: MP Reference Method: EPA method 29 Page 1 of 5

Client:	Rigo + Rigo	City, Province:	Layton Utah
Project Number:	541&265	Test Number:	TI-MP-A
Sample Location:	Main Stack - B	Date:	95 11 17
Start Time:	13:13	Finish Time:	16:58
Barometric Press. (in Hg):	Bkw mb 25.2	Stack Press(in H_2O): + or -:	-.6
Stack Diameter (in.):	53 in.	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes No ✓

Sample Box Number:	T3	Gas Meter Factor:	1.006	Calibration Date:	Sept 19/95
Nozzle I.D.:	Q1	Nozzle Diameter (in.):	0.25	Calibration Date:	
Probe I.D.:	TI-7'	Pitot Coefficient:	0.798	Calibration Date:	Sept/95

Equipment Comments:

STACK GAS COMPOSITION

CO_2 (%): ____ O_2 (%): ____ CO (ppm): ____ Other: ____

Impinger 1 (g)	132.6	Assumed H_2O (%):	12
Impinger 2 (g)	83.6	Filter I.D. #:	520A-102521
Impinger 3 (g)	24.1	Net Filter Wt. (g):	
Impinger 4 (g)	4.4	Net Probe Wash Wt. (g):	
Impinger 5 (g)	2.3	Imp. Residue Wt. (g):	
Impinger 6 (g)	0.2		
XAD-2 Trap (g)	18.1		
Total H_2O Condensed (g)	264.7		

Sampling Comments: Normal - High

Process Rate: Normal Production → High Loading

Control Equipment Operation: ESP

Process Comments: Process down due to plugged

Signature: [signature] Date: 95-11-17

MOISTURE ANALYSIS DATA SHEET

Project #:	541-6265	Client:	RIGO & RIGO
Date:	95.11.17	Test:	T1-MP-A
Sample Location:	STACK B	Filter I.D.:	5106A – 10252
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	BLANK	599.4	466.8	132.6 ✓
2	100 mL 5% HNO_3 / 10% H_2O_2	687.6	604.6	83.0 ✓
3	100 mL 5% HNO_3 / 10% H_2O_2	631.1	607.0	24.1 ✓
4	BLANK	496.9	492.5	4.4 ✓
5	100 mL $KMnO_4$ / H_2SO_4	~~578.7~~ ~~579.0~~	576.4 ~~596.4~~	10.5 2.3 ✓
6	100 mL $KMnO_4$ / H_2SO_4	602.9	600.4 ~~606.4~~	17.5 0.2 ✓
7	Silica	766.0	747.9	18.1 ✓
~~8~~	—			
~~XAD Trap~~				
			Total (g)	264.7 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	147.5	147.4	✓	JA
Post weights	147.5	147.4	✓	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.18

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BOVAR-CONCORD Environmental

DATE: 9/11/17 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Riso + RSO Project #: 5416765 Sample Location: B Stack - East Operators: JW/JM

Run #: T1-MP-A Traverse #: 1 Traverse Direction: OUT Start Time: 13:13 Finish Time: 17:41

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		.84	2.0		804.219	416	232	249	53	NA	82	79	1.0
1	3		.84	2.0	806566	806.55	416	236	249	51		85	80	1.0
2	6		.86	2.1	808.897	808.93	416	238	250	50		86	81	1.0
2	9		0.94	2.3	811.304	811.35	417	239	254	50		86	81	1.0
3	12		0.80	1.8	813.832	813.82	415	240	252	50		86	82	1.0
3	15		0.83	1.9	816.11	816.20	413	240	256	48		86	82	1.0
4	18		1.1	2.6	*818.531	818.55	416	240	257	48		86	82	1.0
4	21		1.0	2.5	821.235	821.29	417	241	256	48		87	83	1.0
5	24		1.1	2.5	*823.85	823.91	418	242	256	47		88	83	1.0
5	27		1.1	2.45	826.345	826.63	419	242	253	47		88	83	1.0
6	30		1.0	2.4	*829.35	829.47	419	242	255	47		88	83	1.0
6	33		1.2	2.8	832.03	832.104	419	242	255	46		88	83	1.0
7	36		1.2	2.9	*834.909	834.84	433	238	261	44		84	81	1.0

Pre test leak check: Rate (cfm) .002 at 16 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

E:\FORMS\STDS.FRM *13:47 - 33 mins into test plant upset @ went down

15:14 - restarted

BOVAR-CONCORD Environmental

DATE: 9/11/17 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rayotheon Project #: 54162165 Sample Location: B-Stack-East Operators: SW/SM

Run #: Tmp-A Traverse #: 1 Traverse Direction: OUT Start Time: 13:13 Finish Time: 15:41

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F) NA	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	39		1.2	2.85	837.605	837.69	433	239	264	43		83	81	1.0
8	42		1.2	2.8	*840.455	840.54	434	240	260	43		84	80	1.0
8	45		1.1	2.6	843.305	843.61	433	240	257	45		85	81	1.0
9	48		1.0	2.4	*846.257	846.25	433	240	256	46		85	81	1.0
9	51		1.0	2.3	848.774	848.80	432	240	255	46		86	81	1.0
10	54		.76	1.8	*851.32	851.33	424	240	255	47		86	81	1.0
10	57		.77	1.8	853.53	853.57	423	239	255	47		86	81	1.0
	60				855.784	855.791								

Pre test leak check: Rate (cfm) ~~.008~~ 0 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .008 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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Static - 0.6

BOVAR-CONCORD Environmental

DATE: 9/11/17 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Riso+Riso Project #: 54162265 Sample Location: B-Stack North Operators: JW/Jm

Run #: TI-mp-B Traverse #: 2 Traverse Direction: OUT Start Time: 11:58 Finish Time: 16:58

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.73	1.8		856.914	414	238	261	57	NA	82	81	1.0
1	3		0.79	1.8	859.100	859.18	415	237	265	45		85	81	1.0
2	6		0.81	1.9	*861.454	861.50	419	238	270	44		87	82	1.0
2	9		0.78	1.6	863.771	863.80	413	239	273	44		88	82	1.0
3	12		0.76	1.5	*866.029	866.04	409	240	274	45		87	82	1.0
3	15		0.76	1.5	868.172	868.18	412	240	277	45		88	83	1.0
4	18		0.72	1.4	*870.412	870.41	416	241	280	46		88	83	1.0
4	21		0.70	1.3	872.583	872.56	415	244	271	46		88	83	1.0
5	24		0.82	1.9	*874.702	874.48	417	249	246	46		88	83	1.0
5	27		0.80	1.8	876.799	876.76	420	240	242	46		85	84	1.0
6	30		1.1	2.6	*879.018	878.99	422	246	239	46		89	84	1.0
6	33		1.2	2.75	881.637	881.61	424	246	240	46		89	84	1.0
7	36		0.90	2.2	*884.281	884.28	424	249	242	46		89	84	1.0

Pre test leak check: Rate (cfm) .007 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .004 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: JW

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BOVAR-CONCORD Environmental

DATE: 9/11/17 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rizo Flujo Project #: 54116265 Sample Location: B Stack North Operators: SJ/JM

Run #: Train-A Traverse #: 2 Traverse Direction: out Start Time: 15:58 Finish Time: 16:58

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	39		1.0	2.5	886.675	886.68	421	246	239	47	N/A	90	85	1.5
8	42		0.9	2.2	*889.204	889.28	416	245	239	45		90	85	1.5
8	45		0.85	1.8	891.675	891.68	406	244	239	44		90	85	1.5
9	48		0.65	1.2	*894.039	894.07	397	244	239	44		90	85	1.5
9	51		0.71	1.4	896.133	896.13	396	243	230	44		89	85	1.5
10	54		0.63	1.1	*898.316	898.30	389	243	240	44		89	85	1.5
10	57		0.63	1.2	900.347	900.33	389	242	243	44		89	85	1.5
10	60				902.361	902.359								

Pre test leak check: Rate (cfm) .007 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .004 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 541626 DATE: 95117 TEST T/MP-A

Client: RigoRigo Location: B Stack Operator: JW

Sample Type: _____ Reference Method: _____

Modifications: _____

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	←→	
Static positive or negative	←→	
Average Temperature	←→	
Estimate % H_2O	←→	12
How estimated?	←→	
Estimate Gas Composition	←→	O_2% ___ CO_2(%) ___ CO(ppm) ___
How Estimated?	←→	
Proper nozzle selected?	✓	
K factor	←→	
Number of sampling points per traverse	←→	
Probe markings correct?	✓	
Time per point	←→	60
Number of readings per point	←→	2
Barometric Pressure Measured?	✓	
Mercury		
Aneroid		
Other		
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or		
Quartz	✓	
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?		Yes
PROBE LINER:		
Borosilicate or		
Quartz or	✓	
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5414265 DATE: 951117 TEST TI-MP-A

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	X	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone		
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre		
Quartz		
Other		
Filter checked visually for irregularities		
Filter centered properly		
Filter labelled		
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol		NA
Thermocouple attached to trap		
XAD-2 Trap covered with foil at all times		

PROJECT # 5416265 DATE: 951117 TEST TI-MP-A

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol		
IMPINGERS		
No. of Impingers	←→	
Contents #1	←→	
#2	←→	
#3	←→	
#4	←→	
#5	←→	
#6	←→	
Impinger weights recorded		
Impingers properly assembled		
Recirculating pump set up properly		
Modifications	←→	
Grease used on joints		
Silica gel type	←→	
New?		
Used?		
Pre Test Leak Check		
Performed	✓	
Rate	←→	.002 cfm@ 16 "Hg
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	N/A	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	←→	good
Leak checks at port changes Before	←→	.008 cfm@ 15 "Hg
After	←→	.007 cfm@ 15 "Hg
Final leak race acceptable	←→ ✓	.004 cfm@ 15 "Hg
General comments on sampling technique	←→	
Sample recovery performed on-site?	✓	
Sample recovery performed by	←→	JA
Clean-up area - General Environment	←→	✓
Brushes: Nylon bristle		
Other	✓	teflon
Wash Bottles: Glass		

QA/QC CHECKLIST

PROJECT # 5416265 DATE: 95/11/7 TEST T/MP-A

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene	✓	
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	↔	teflon
Leak free	✓	
Petri Dishes: borosilicate glass		
plastic	✓	
Balance Type	↔	electronic
Calibrated or QC checked	↔	Actual 142.5 (g) Measured 142.5 (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		blue
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?	✓	
Colour of Filter	✓	offwhite
Foil Wrapped?		
Probe Rinses		
Acetone	✓	
Other	✓	0.1N HNO_3
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	NA	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab		Fed Ex to lab

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: STACK B TEST #: T1-MP-A DATE: 95-11-17 PROJECT NO.: 541-6265

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	**Container TS3 Front Half 0.1 N HNO3 Rinse** Final Wt.: 955.5 Initial Wt.: 262.6 Gain: 192.9 Comments:	Brush loose particulate onto filter	**Container TS4-1 Impinger 4 Contents** Final Wt.: 711.8 Initial Wt.: 262.6 Gain: 449.2	**Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse** Final Wt.: 403.8 Initial Wt.: 262.2 Gain: 141.6 Colour: CLEAR	Rinse with 100 mL 0.1 N HNO3	Rinse 3x with 100 mL Acidified KMnO4	Place rinsing in Container 5C which contains 200 mL of water	
Container TS1 Front Half Acetone Rinse Final Wt.: 348.3 Initial Wt.: 265.0 Gain: 83.3 Comments:		**Filter TS2** Seal petri dish with tape Colour: CREAM Filter #: 5106-A			**Container TSA Impinger 4 Contents** Final Wt.: 386.2 Initial Wt.: 262.4 Gain: 123.8	Rinse with 100 mL water	**Container 5C HCL Rinse** Final Wt.: 488.2 Initial Wt.: 262.7 Gain: 225.5 Colour: CLEAR	
						Container 5B Impinger 5 & 6 KMnO4 Content and Rinses Final Wt.: 7777 Initial Wt.: 262.8 Gain: 514.9 Colour: PURPLE		

A filters crumbling & static-y some in probe wash

Train Identification	Blanks	
Train No.:		
HNO3 / H2O2 Batch No.:	Container 9	200 mLs
DI Water Batch No.:	Container 8B	100 mLs
Acetone Batch No.:	Container 7	100 mLs
0.1 N HNO3 Batch No.:	Container 8A	300 mLs
Acidified KMnO4 Batch No.:	Container 10	100 mLs
8 N HCl / Batch No.: DI Water	Container 11	25 mL / 200 mL
Filter Number:	Container 12	* 5110A - BE

Mark Liquid Level on Containers
Seal and Label Containers
Reagent Blanks Submitted? Yes ✓ No ____
Prepare Fresh Acidified KMnO4 Daily ✓

2640N 102525

M29REC.DRW-May 95

BOVAR-CONCORD Environmental

NOVEMBER 18, 1995

Bp = 25.44

8:30 - 9:30

METHOD 26
HCl SAMPLING DATA FORM

Company Name	DAVIS COUNTY	Plant Location	LAYTON UTAH	Source Name	STACK B
Test Date	NOV 18 '95	Test Number	T3-HCl-A	Job Number	5416265
Sampling for	HCl	Meter Box	Y = 1.001	B.P. mm/inHg	861 mm Hg

ABSORBING SOL'N	15 ml 0.1 N H_2SO_4	15 ml 0.1 N H_2SO_4	15 ml 0.1 N NaOH	15 ml 0.1 N NaOH	Silica Gel	GAS	1	2	3	4
WEIGHTS	IMP 1	IMP 2	IMP 3	IMP 4	IMP 5	READINGS				
EMPTY						O2				
FILLED FINAL						C02				
FILLED INITIAL						CO				
DIFFERENCE						TIME				

OPERATOR		Sample Rate (Lpm)	~2	H20 Condensed	
Lk.Chk, (Init.)	0 cc/min	Lk. Chk. (Final)	0 cc/min	Probe Purged	(Yes) No)

Sample Time	Clock Time	Volume m^3 Desired	Volume m^3 Actual	Vacuum in.Hg	Meter Temp. °C/(°F)	Probe Temp. °C/(°F)	Box Temp. °C/(°F)	Impinger Temp. °C/°F
0	0		9.75	1	66	290	290	
10	5		20.25	1	70	295	245	
20	10		30.6	1	69.5	249	250	
30	15		40.6	1	70	290	257	
40	20		50.65	1	67	242	258	
50	25		60.9	1	67	283	261	
60	30		70.95	1	67.5	247	262	
70	35		81.25	1	67.5	296	263	
80	40		91.3	1	65.5	243	262	
90	45		101.3	1	66	295	260	
100	50		111.4	1	66	244	261	
110	55		121.45	1	68	293	261	
120	60		131.45	1	68	245	262	
		MC/TO	121.7	1	67.5	270	257	

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4.297 ft³

BOVAR-CONCORD Environmental

MOISTURE ANALYSIS DATA SHEET

Project #:	5416254	Client:	Rice & Rice
Date:	95.11.18	Test:	F3-HCl-A
Sample Location:	Stack 5	Filter I.D.:	N.A
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	92.3	86.3	6.0 ✓
2	0.1N H_2SO_4	99.0	94.9	4.1 ✓
3	0.1N H_2SO_4	106.8	106.7	0.1 ✓
4	Blank	71.0	71.0	0
5	0.1N NaOH	98.9	98.9	0
6	0.1N NaOH	97.3	97.1	0.2 ✓
7	SG	126.4	125.4	1.0 ✓
8	—			
XAD Trap	—			
			Total (g)	11.9 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	147.5	147.5	✓	JA
Post weights	147.5	147.5	✓	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.18

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BOVAR-CONCORD Environmental

HCl METHOD 26 SAMPLING TRAIN
RECOVERY DATA FORM

PROJECT NO.: 541625

LOCATION: STACK B TEST #: T3-HCl-A DATE: 95.11.18

Impingers 1 and 2
Weigh impingers Empty contents into container and rinse with DI water

Impingers 3 and 4
Weigh impingers Empty contents into container and rinse with DI water

Container TS1 Impingers 1 and 2 0.1 N H2SO4 Contents and DI Water Rinses	
Final Wt.:	133.9
Initial Wt.:	339
Gain:	100.0

73.8

Container TS2 Impingers 3 and 4 0.1 N NaOH Contents and DI Water Rinses	
Final Wt.:	133.0
Initial Wt.:	33.0
Gain:	100.0

Mark Liquid Level ✓	Seal and Label ✓

Train Identification	
Train No.:	T3-HCl-A
0.1 N H2SO4 Batch No.:	Zero
DI Water Batch No.:	Zero
0.1 N NaOH Batch No.:	Zero
Train Loaded By:	JD
Recovered By:	JA
Reagent Blank Submitted: Yes _____ No _____	

PART 1 OF 2

SYSTEM CALIBRATION AND DRIFT CALCULATIONS

CLIENT	RIGO+RIGO	DATE	NOV18/95
PROJECT NUMBER	5416265	TIME START	10:16
SAMPLE LOCATION	STACK	TIME FINISH	~~15:03~~ 11:40
	TEST NUMBER	T2CEMA	

INSTRUMENT SPAN VALUES

OXYGEN	25	%	CARBON DIOXIDE	20 %
SULPHUR DIOXIDE	1000	PPM	CARBON MONOXIDE	1000 PPM
NITROGEN OXIDES	1000	PPM	TOTAL HYDROCARBONS	100 PPM

ITEM	CAL.GAS VALUE	ANAL. CAL.	INITIAL VALUES SYSTEM CAL.	INITIAL VALUES SYSTEM CAL. BIAS (% SPAN)	FINAL VALUES SYSTEM CAL.	FINAL VALUES SYSTEM CAL. BIAS (% SPAN)	DRIFT (% SPAN)
O2 ZERO	0	0.02	0.06	0.2	0.1	0.3	0.2
O2 CAL	9.91	9.97	9.98	0.0	10.32	1.4	1.4
SO2 ZERO	0	-1	2	0.3	-41	-4.0	-4.3
SO2 SPAN	149	150.1	139	-1.1	104	-4.6	-3.5
NOX ZERO	0	2	7.5	0.6	50	4.8	4.3
NOX SPAN	302	295.7	301	0.5	354	5.8	5.3
CO2 ZERO	0	0.08	0.1	0.1	0.15	0.4	0.3
CO2 SPAN	7.01	7.07	7.02	-0.3	7.06	-0.1	0.2
CO ZERO	0	-1	0.09	0.1	-1.4	-0.0	-0.1
CO SPAN	100	99.6	99.2	-0.0	97.3	-0.2	-0.2
THC ZERO	0	-0.6	-0.15	0.5	1.1	1.7	1.3
THC SPAN	20.1	20.8	21.3	0.5	23.1	2.3	1.8

DRIFT CRITERIA <5% SPAN
BIAS CRITERIA <5% SPAN

PART 2 OF 2

SYSTEM CALIBRATION AND DRIFT CALCULATIONS

CLIENT	RIGO+RIGO	DATE	NOV18/95
PROJECT NUMBER	5416265	TIME START	12:02
SAMPLE LOCATION	STACK	TIME FINISH	15:03
	TEST NUMBER	T2CEMA	

INSTRUMENT SPAN VALUES

OXYGEN	25 %	CARBON DIOXIDE	20 %
SULPHUR DIOXIDE	1000 PPM	CARBON MONOXIDE	1000 PPM
NITROGEN OXIDES	1000 PPM	TOTAL HYDROCARBONS	100 PPM

ITEM	CAL.GAS VALUE	ANAL. CAL.	INITIAL VALUES SYSTEM CAL.	INITIAL VALUES SYSTEM CAL. BIAS (% SPAN)	FINAL VALUES SYSTEM CAL.	FINAL VALUES SYSTEM CAL. BIAS (% SPAN)	DRIFT (% SPAN)
O2 ZERO	0	0.02	0.06	0.2	0.1	0.3	0.2
O2 CAL	9.91	9.97	9.98	0.0	10.32	1.4	1.4
SO2 ZERO	0	-1	2	0.3	-1	0.0	-0.3
SO2 SPAN	149	150.1	139	-1.1	141	-0.9	0.2
NOX ZERO	0	2	7.5	0.6	4	0.2	-0.4
NOX SPAN	302	295.7	301	0.5	302	0.6	0.1
CO2 ZERO	0	0.08	0.1	0.1	0.15	0.4	0.3
CO2 SPAN	7.01	7.07	7.02	-0.3	7.06	-0.1	0.2
CO ZERO	0	-1	0.09	0.1	-1.4	-0.0	-0.1
CO SPAN	100	99.6	99.2	-0.0	97.3	-0.2	-0.2
THC ZERO	0	-0.6	-0.15	0.5	1.1	1.7	1.3
THC SPAN	20.1	20.8	21.3	0.5	23.1	2.3	1.8

DRIFT CRITERIA <5% SPAN
BIAS CRITERIA <5% SPAN

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.18.95
RUN : T2-OC-A
LOC. : STACK B

RUN TIME : 10:14 TO 12:50

ORGANICS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
ORGANICS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	1.8098 DSm3	63.904 DScf
AVERAGE ISOKINETICITY	100.0 %	

FLUE GAS CHARACTERISTICS

MOISTURE	12.41 %	
TEMPERATURE	202.6 deg C	396.7 deg F
FLOW	48872 DSm3/hr	28765 DScfm
	105341 Am3/hr	62002 Acfm
VELOCITY	20.56 m/s	4046.9 fpm

GAS ANALYSIS	O2	11.00 %
	CO2	9.20 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.02 g/gmole D.B.
	MOL. WT.	28.53 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.18.95
RUN : T2-OC-A
LOC. : STACK B

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	85.8 kPa	25.32 in.Hg
STATIC PRESSURE	-119.5 Pa	-0.48 in.H2O
NOZZLE DIAMETER	5.79 mm	0.2280 in.
PITOT COEFFICIENT	0.796	
METER CORRECTION FACTOR	0.983	

CONDENSATE COLLECTION

RESIN TRAP CONDENSATE	1.7 g
CONDENSATION IN IMPINGER 1	164.4 g
CONDENSATION IN IMPINGER 2	5.2 g
CONDENSATION IN IMPINGER 3	1.4 g
CONDENSATION IN IMPINGER 4	0.9 g
SILICA GEL WEIGHT GAIN	15.1 g
TOTAL MOISTURE GAIN	188.7 g

ORGANICS COLLECTION

FILTER ORGANICS	0.0000 mg
WASHINGS ORGANICS	0.0000 mg
RESIN ORGANICS	0.0000 mg
IMPINGER ORGANICS	0.0000 mg
TOTAL ORGANICS	0.0000 mg

TOTAL SAMPLING TIME	120.0 min.

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.18.95
RUN : T2-OC-A
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1													
1	0.0	390	0.700	0.95	13.16	73	245	235	55	53	6.0	1.0	101.7
1	3.0	383	0.500	0.75	14.94	74	246	241	56	50	5.0	1.0	98.6
2	6.0	388	0.600	0.80	16.41	75	247	251	56	44	7.0	2.0	100.0
2	9.0	389	0.740	0.90	18.04	76	247	261	50	44	7.0	2.0	98.3
3	12.0	400	0.960	1.30	19.82	77	248	267	49	43	8.0	3.0	96.5
3	15.0	398	0.860	1.20	21.80	77	248	267	49	44	8.0	3.0	99.7
4	18.0	400	0.760	1.00	23.74	78	249	270	49	45	8.0	4.0	99.5
4	21.0	404	0.660	0.85	25.56	78	248	273	50	45	7.0	4.0	96.3
5	24.0	400	0.620	0.85	27.20	78	249	276	51	46	7.0	5.0	100.3
5	27.0	398	0.690	0.90	28.86	78	250	276	52	46	7.0	5.0	100.1
6	30.0	400	1.100	1.60	30.61	78	251	277	52	46	10.0	6.0	98.6
6	33.0	399	0.860	1.20	32.78	79	251	275	52	47	8.0	6.0	100.5
7	36.0	400	0.860	1.20	34.74	79	249	276	54	48	8.0	7.0	100.5
7	39.0	401	0.920	1.30	36.70	80	250	277	55	48	9.0	7.0	100.1
8	42.0	395	0.960	1.40	38.72	80	251	280	55	48	9.0	8.0	100.1
8	45.0	395	0.960	1.40	40.79	80	250	279	55	48	9.0	8.0	99.6
9	48.0	385	0.720	1.00	42.85	80	250	250	56	48	7.0	9.0	97.6
9	51.0	382	0.720	1.00	44.61	80	250	253	56	49	7.0	9.0	98.5
10	54.0	382	0.680	0.90	46.39	80	248	255	56	49	7.0	10.0	99.1
10	57.0	375	0.680	0.95	48.13	80	250	250	56	49	7.0	10.0	99.8
	60.0				49.89								
TRAVERSE NO. 2													
1	0.0	415	0.840	1.20	50.29	77	247	237	80	64	8.0	1.0	98.3
1	3.0	418	0.720	1.10	52.16	78	248	241	60	55	8.0	1.0	104.4
2	6.0	409	0.770	1.10	54.00	79	250	238	60	49	8.0	2.0	100.3
2	9.0	392	0.820	1.10	55.84	79	250	241	57	49	8.0	2.0	98.3
3	12.0	398	0.940	1.40	57.72	80	249	240	56	50	9.0	3.0	100.8
3	15.0	397	1.100	1.60	59.78	80	250	241	55	50	10.0	3.0	99.9
4	18.0	397	1.100	1.60	61.99	81	250	241	55	52	10.0	4.0	99.8
4	21.0	405	1.100	1.60	64.20	81	250	242	55	52	10.0	4.0	100.7
5	24.0	406	1.100	1.60	66.42	81	251	241	55	53	10.0	5.0	100.7
5	27.0	404	1.000	1.50	68.64	81	251	243	55	55	10.0	5.0	104.0
6	30.0	410	1.000	1.40	70.83	81	251	242	55	55	10.0	6.0	102.0
6	33.0	406	1.000	1.40	72.97	81	251	242	55	55	10.0	6.0	101.3
7	36.0	405	1.100	1.60	75.10	81	252	241	55	55	11.0	7.0	100.2

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.18.95
RUN : T2-OC-A
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	407	1.000	1.40	77.31	81	251	240	55	55	10.0	7.0	101.3
8	42.0	411	1.000	1.40	79.44	81	250	240	55	55	10.0	8.0	101.6
8	45.0	405	1.000	1.40	81.57	81	250	247	56	56	10.0	8.0	101.2
9	48.0	375	0.720	1.10	83.70	81	250	245	58	56	8.0	9.0	101.7
9	51.0	400	0.740	1.10	85.55	81	250	245	58	56	8.0	9.0	101.3
10	54.0	370	0.500	0.70	87.39	81	250	246	58	56	6.0	10.0	99.2
10	57.0	375	0.500	0.70	88.90	81	250	247	58	56	6.0	10.0	98.2
	60.0				90.39								
		397	0.830	1.19		79	249	253	55	51	8.3		100.0

ISOKINETIC TEST DATA FORM

Sample Type: Organics Reference Method: EPA M23 Page 1 of 5

Client:	Rugo Rugo	City, Province:	Layton, UTAH
Project Number:	5416265	Test Number:	T2-OCA
Sample Location:	B Stack	Date:	Nov 18/95
Start Time:	10:14	Finish Time:	12:50
Barometric Press. (in Hg):	25.32	Stack Press(in H_2O): + or -:	-0.48
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes (No)

Sample Box Number:	T1	Gas Meter Factor:	.983	Calibration Date:	Sept 19/95
Nozzle I.D.:	T1-2	Nozzle Diameter (in.):	0.229	Calibration Date:	Nov 16/95
Probe I.D.:	T27	Pitot Coefficient:	0.796	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): _____ 0_2 (%): _____ CO (ppm): _____ Other: _____

Impinger 1 (g)	164.4	Assumed H_2O (%):	18
Impinger 2 (g)	5.2	Filter I.D. #:	—
Impinger 3 (g)	1.4	Net Filter Wt. (g):	—
Impinger 4 (g)	0.9	Net Probe Wash Wt. (g):	—
Impinger 5 (g) (SG)	15.1	Imp. Residue Wt. (g):	—
~~Impinger 6 (g)~~ Coil	0.0		
XAD-2 Trap (g)	1.7		
Total H_2O Condensed (g)	188.7		

Sampling Comments: Train 02

Process Rate: _____

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: Nov 18/95

MOISTURE ANALYSIS DATA SHEET

Project #:	541-6265	Client:	Riggs Rico
Date:	Nov 18th '95	Test:	T2-OC A
Sample Location:	B - STACK	Filter I.D.:	—
Pre Weights by:	RB / HVB	Post Weights by:	RB / HVB

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Empty	593.9	429.5	164.4 ✓
2	RODI H_2O	605.3	600.1	5.2 ✓
3	RODI H_2O	609.5	608.4	1.4 ✓
4	Empty	462.6	461.7	0.9 ✓
5	Silica Gel	807.0	791.9	15.1 ✓
~~6~~				
~~7~~				
8 Coil		233.8	233.8	0.0 ✓
XAD Trap		322.4	320.7	1.7 ✓
			Total (g)	188.7 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: Train 02

Signature: _____ Date: Nov 19/95

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BOVAR-CONCORD Environmental

DATE: 12 / 11 / 95 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Rigo & Rigo Project #: 54162.65 Sample Location: B Stack Operators: HVB

Run #: TI-OCA Traverse #: 1 Traverse Direction: North Start Time: 10:14 Finish Time: _____

Pt. For well	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.70	0.95	.591	13.16	390	245	235	53	55	73	72	6
	3		0.50	0.75	.499	14.94	383	246	241	50	56	75	73	5
2	6		0.60	.80	.547	16.41	398	247	251	44	56	76	73	7
	9		0.74	.90	.607	18.04	389	247	261	44	50	78	73	7
3	12		0.96	1.3	.692	19.82	400	248	267	45	49	78	75	8
	15		0.86	1.2	.655	21.80	398	248	267	44	49	79	75	8
4	18		0.76	1.0	.615	23.74	400	249	270	45	49	80	75	8
	21		0.66	.85	.573	25.56	404	248	273	45	50	81	75	7
5	24		0.62	.85	.556	27.20	400	249	276	46	51	81	75	7
	27		0.69	.90	.586	28.86	398	250	276	46	52	81	75	7
6	30		1.10	1.60	.740	30.61	400	251	277	46	52	81	75	10
	33		0.86	1.2	.655	32.78	399	251	275	47	52	82	75	8

Pre test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 10.90 Leak Volume End: 13.16

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 12/11/95 SAMPLING TRAINS DATA SHEET PAGE 3 OF 5

Client: Rigo + Rigo Project #: 5416865 Sample Location: B Stack Operators: HVB

Run #: T2-OCB Traverse #: 1 Traverse Direction: North Start Time: _____ Finish Time: 11:14

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.86	1.2	.655	34.74	400	249	276	48	54	82	76	8
	39		0.92	1.3	.677	36.70	401	250	277	48	55	83	76	9
8	42		0.96	1.4	.692	38.72	395	251	280	48	55	83	76	9
	45		0.96	1.4	.692	40.79	395	250	279	48	55	83	76	9
9	48		0.72	1.0	.599	42.85	396	250	250	48	56	83	76	7
	51		0.72	1.0	.599	44.61	392	256	253	49	56	83	76	7
10	54		0.68	0.9	.582	46.39	392	248	255	49	56	83	76	7
	57		0.68	0.95	.591	48.13	375	250	250	49	56	83	76	7
	60					49.89								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: 49.89 Leak Volume End: _____

Post test leak check: Rate (cfm) 0.004 at 15 inches Hg (Vacuum) Leak Volume Start: 49.89 Leak Volume End: 50.07

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 12/16/95 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: Rigo + Rigo Project #: 541/6265 Sample Location: B Stack Operators: HVB

Run #: 12-OCB Traverse #: 2 Traverse Direction: East Start Time: 11:50 Finish Time: _____

Pt. For 11	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.84	1.2	.647	50.29	415	247	237	64	80	77	76	8
	3		0.72	1.1	.599	52.16	418	246	241	55	60	79	76	8
2	6		0.77	1.1	.619	54.00	409	256	238	49	60	81	76	8
	9		0.82	1.1	.639	55.84	392	250	241	49	57	81	76	8
3	12		0.94	1.4	.684	57.72	398	249	240	50	56	82	77	9
	15		1.10	1.6	.740	59.78	397	250	241	50	55	83	77	10
4	18		1.10	1.6	.740	61.99	397	250	241	52	55	84	77	10
	21		1.10	1.6	.740	64.20	405	250	242	52	55	84	77	10
5	24		1.10	1.6	.740	66.42	406	251	241	53	55	84	78	10
	27		1.0	1.5	.706	68.64	404	251	243	55	55	84	78	10
6	30		1.0	1.4	.706	70.83	410	251	242	55	55	84	78	10
	33		1.0	1.4	.706	72.97	406	251	242	55	55	84	78	10

Pre test leak check: Rate (cfm) 0.007 at 15 inches Hg (Vacuum) Leak Volume Start: 50-07 Leak Volume End: 50-29

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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DATE: 10/11/95 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rigo & Rigo Project #: 5416265 Sample Location: B Stack Operators: HVB

Run #: T2-0KA Traverse #: 2 Traverse Direction: East Start Time: _____ Finish Time: 12:50

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		1.10	1.6	.740	75.10	405	252	241	55	55	84	78	11
	39		1.0	1.4	.706	77.31	407	251	240	55	55	84	78	10
8	42		1.0	1.4	.706	79.44	411	250	240	55	55	84	78	10
	45		1.0	1.4	.706	81.57	405	250	247	56	56	84	78	10
9	48		0.72	1.1	.608	83.70	375	250	245	56	58	84	78	8
	51		0.74	1.1	.607	85.55	400	250	245	56	58	84	78	8
10	54		0.50	0.7	.506	87.39	370	250	246	56	58	84	78	6
	57		0.50	0.7	.506	88.90	375	250	247	56	58	84	78	6
	60					90.39								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.005 at 15 inches Hg (Vacuum) Leak Volume Start: 90.39 Leak Volume End: 90.65

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: Nov 19/95 TEST T2-OCB

Client: Big + Rigg Location: B Stack Operator: AVB
Layton, UTAH
Sample Type: Organic(s) Reference Method: EPA M23
Modifications: train rinse acetone/DCM followed by toluene
Train O2

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP		0.86 in H_2O
Static positive or negative		-0.51 in H_2O
Average Temperature		400 °F
Estimate % H_2O		T1-OCA 14%
How estimated?		~~Assumed Typical Moisture~~
Estimate Gas Composition		O_2% 10 CO_2(%) 10 CO(ppm) 40
How Estimated? Bovar CEM T1-CEMA		~~CEM (Bottle) Source Specific Test~~
Proper nozzle selected?	✓	
K factor		~~.85~~ .706 at 400°F
Number of sampling points per traverse		10
Probe markings correct?	✓	
Time per point		6
Number of readings per point		2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other Watch	✓	
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		Pitot rinse after T1-OCA
Cleaned according to protocol	✓	~~Rinsed Nozzle after T1-OCA~~
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		Pitot rinse after T1-OCA
Cleaned according to protocol	✓	~~Rinsed Nozzle after T1-OCA~~
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5416265 DATE: Nov 18/95 TEST T2-OCA

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	⟷	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type	K	
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 5416265 DATE: Nov 18/05 TEST T2-OCA

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	MT
#2	⟷	RODI
#3	⟷	RODI
#4	⟷	MT
#5	⟷	S.G.
~~#6~~	⟷	—
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	⟷	None
Grease used on joints	X	
Silica gel type	⟷	
New?	~~✓~~	
Used?	✓	used after T1-OCA (25% spent)
Pre Test Leak Check		
Performed	✓	
Rate	⟷	0.01 cfm@ 15 "Hg
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	Good (25% spent)
Leak checks at port changes Before	⟷	0.004 cfm@ 15 "Hg
After	⟷	0.005 cfm@ 15 "Hg
Final leak race acceptable	⟷	0.005 cfm@ 15 "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	RB/JA
Clean-up area - General Environment	⟷	Clean
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 5416265 DATE: Nov 18/95 TEST T2-0CB

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	---	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass	X	Clean foil & Zip bag
plastic		
Balance Type	---	Top loader
Calibrated or QC checked	---	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour	✓	blue top 1/3
Weighed	✓	
Filter Handling		
Tweezers used?	✓	Teflon
Condition?		
Colour of Filter		
Foil Wrapped?		
Probe Rinses	✓	
Acetone /DCM + Toluene	✓	
Other		
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

Method was clarified, combination of samples entered. Toluene (traces) in DCM/Acetone jar. + water (")

#2

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: B-Street TEST #: T2-OCA DATE: Nov 18/95 PROJECT NO.: 541-6265

Nozzle, Probe Liner Front Half Filter Holder	Filter	Front Half Back Half Filter ~~Holder and~~ Condenser ~~Coil~~	XAD Resin	Impingers & ~~HPLC Rinse~~	Back Half Rinse
Wash and brush 3x each with ~~hexane~~ DCM and acetone. Rinse 3x with with ~~hexane~~ DCM and and acetone.	Remove and place on pre-cleaned foil fold in half and place in ~~petri dish~~. Ziplock bag	**Weigh Coil & Record Weight** ~~Soak 5 minutes each with hexane and acetone. Rinse 3x with hexane and acetone.~~ Toluene Rinse	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into #4 container. Rinse 3x with HPLC water.	Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone.
Container ~~TS1~~ TS2 Front Half Acetone Hexane Rinse Final Wt: 492.4 Initial Wt: 262.8 Gain: 229.6	**Container ~~TS2~~ TS1 Filter** Filter ID: T2-OCA Colour: off white	**Container TS3 ~~Back Half Filter and Condenser Coil~~** Final Wt: 387.7 Initial Wt: 261.9 Gain: 125.8 Colour:	**Container TS4 XAD Resin** **Wrap in Foil** XAD: C45429 Colour: off white	**Container TS5 Impinger Contents** Final Wt: 657.0 Initial Wt.: 262.2 Gain: 394.8 Colour:	**Container TS6 Back Half Rinse** Final Wt.: Initial Wt.: Gain: Colour:
Mark Fluid Levels Seal and Label					

Train & Proofing Identification	
Train No.:	02
~~HPLC~~ Batch No.:	Zenon 95/10/26
Acetone Batch No.:	Caledon 14123
~~Hexane~~ Batch No.:	Caledon 16700
Filter Batch No.:	Zenon 95/10/24 XAD No.: C45428
Train Assembled By:	HNB
Train Recovered By:	RB

Reagent Blanks Collected?	YES
Combined Acetone/~~Hexane~~ DCM	YES
~~Combined Glycol~~/Water	YES
Blank Train Collected?	
Comments:	FILTER YES TOLUENE "

TS 5
2 of 2
Final 523.7
Initial 262.6
Gain
Colm

EPSREC.DRW-May 95

BOVAR-CONCORD Environmental

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 18
RUN : T2-MP-A
LOC. : B STACK

RUN TIME : 12:02 TO 14:45

METALS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
METALS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	2.1459 DSm3	75.772 DScf
AVERAGE ISOKINETICITY	101.4 %	

FLUE GAS CHARACTERISTICS

MOISTURE	13.36 %	
TEMPERATURE	214.0 deg C	417.3 deg F
FLOW	47528 DSm3/hr	27974 DScfm
	105723 Am3/hr	62226 Acfm
VELOCITY	20.63 m/s	4061.6 fpm

GAS ANALYSIS	O2	11.00 %
	CO2	9.20 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.02 g/gmole D.B.
	MOL. WT.	28.42 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 18
RUN : T2-MP-A
LOC. : B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.0 kPa	25.40 in.Hg
STATIC PRESSURE	-124.5 Pa	-0.50 in.H2O
NOZZLE DIAMETER	6.35 mm	0.2500 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	110.7 g
CONDENSATION IN IMPINGER 2	76.0 g
CONDENSATION IN IMPINGER 3	24.8 g
CONDENSATION IN IMPINGER 4	4.5 g
CONDENSATION IN IMPINGER 5	2.6 g
CONDENSATION IN IMPINGER 6	0.3 g
SILICA GEL WEIGHT GAIN	24.6 g
TOTAL MOISTURE GAIN	243.5 g

METALS COLLECTION

FILTER METALS	0.0000 mg
WASHINGS METALS	0.0000 mg
IMPINGER METALS	0.0000 mg
TOTAL METALS	0.0000 mg

TOTAL SAMPLING TIME 120.0 min.

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 18
RUN : T2-MP-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	419	0.680	1.50	907.53	75	242	247	55	1.0	1.0	105.0
1	3.0	418	0.780	1.70	909.61	77	241	246	47	1.0	1.0	104.2
2	6.0	419	0.800	1.70	911.83	78	243	246	44	1.0	2.0	104.2
2	9.0	419	0.780	1.60	914.08	78	244	247	42	1.0	2.0	101.6
3	12.0	422	0.680	1.40	916.25	79	245	248	42	1.0	3.0	101.2
3	15.0	422	0.810	1.70	918.27	80	246	251	42	1.0	3.0	101.5
4	18.0	425	0.810	1.70	920.48	80	248	250	43	1.0	4.0	103.0
4	21.0	427	0.810	1.70	922.72	80	250	249	43	1.0	4.0	102.2
5	24.0	426	0.800	1.60	924.94	81	250	249	45	1.0	5.0	101.2
5	27.0	426	0.810	1.70	927.13	81	249	248	45	1.0	5.0	101.5
6	30.0	428	1.200	2.50	929.34	81	248	247	45	1.0	6.0	101.9
6	33.0	428	1.200	2.50	932.03	82	248	246	45	1.0	6.0	102.8
7	36.0	428	1.100	2.40	934.75	82	250	247	46	1.0	7.0	105.4
7	39.0	427	1.100	2.30	937.42	82	248	245	46	1.5	7.0	103.6
8	42.0	426	0.820	1.75	940.05	82	248	246	46	1.5	8.0	102.0
8	45.0	414	0.730	1.50	942.29	83	247	244	47	1.5	8.0	102.9
9	48.0	410	0.500	1.10	944.44	83	246	246	47	1.5	9.0	102.6
9	51.0	410	0.530	1.10	946.22	83	246	245	47	1.5	9.0	102.4
10	54.0	410	0.430	0.90	948.05	83	245	245	46	1.5	10.0	102.5
10	57.0	407	0.420	0.86	949.70	83	245	245	46	1.5	10.0	99.7
	60.0				951.29							
TRAVERSE NO. 2												
1	0.0	412	0.740	1.45	952.39	81	241	242	54	1.0	1.0	98.5
1	3.0	413	0.740	1.50	954.46	82	241	240	48	1.0	1.0	99.4
2	6.0	415	0.880	1.80	956.55	83	241	242	47	1.0	2.0	100.4
2	9.0	417	0.970	2.20	958.85	84	242	240	45	1.0	2.0	103.6
3	12.0	417	0.900	2.00	961.34	84	243	242	46	1.0	3.0	101.4
3	15.0	416	0.850	1.75	963.69	84	244	243	47	1.0	3.0	102.4
4	18.0	415	0.850	1.65	966.00	84	244	242	48	1.0	4.0	100.5
4	21.0	414	0.870	1.75	968.27	84	244	242	49	1.0	4.0	98.9
5	24.0	414	0.860	1.75	970.53	84	245	241	49	1.0	5.0	99.9
5	27.0	415	0.950	2.10	972.80	84	245	245	49	1.0	5.0	100.2
6	30.0	414	0.900	2.00	975.19	84	246	241	49	1.0	6.0	101.6
6	33.0	414	0.900	1.95	977.55	84	246	241	50	1.0	6.0	101.1
7	36.0	416	0.880	1.80	979.90	84	246	243	50	1.0	7.0	100.6

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 18
RUN : T2-MP-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	413	0.800	1.65	982.21	85	246	244	51	1.0	7.0	100.6
8	42.0	413	0.790	1.60	984.42	85	246	242	51	1.0	8.0	100.3
8	45.0	413	0.820	1.65	986.61	85	245	242	50	1.0	8.0	99.0
9	48.0	412	0.770	1.50	988.81	85	244	243	50	1.0	9.0	98.7
9	51.0	413	0.860	1.75	990.94	85	245	241	50	1.0	9.0	100.1
10	54.0	411	0.820	1.65	993.22	85	244	238	50	1.0	10.0	99.6
10	57.0	413	0.880	1.80	995.44	86	244	243	50	1.0	10.0	100.2
	60.0				997.75							
		417	0.812	1.71		82	245	244	47	1.1		101.4

ISOKINETIC TEST DATA FORM

Sample Type: MS Reference Method: EPA Method 29 Page 1 of 5

Client:	Rio Tinto	City, Province:	Layton, Utah
Project Number:	546265	Test Number:	T2-MP-A
Sample Location:	Stack B	Date:	95/11/8
Start Time:	12:02	Finish Time:	14:45
Barometric Press. (in Hg):	25.91 in Hg	Stack Press(in H_2O): + or -:	-.5
Stack Diameter (in.):	53	Length x Width:	____ x ____
Stack Height (ft):	116	Cyclonic Flow:	Yes No

Sample Box Number:	T3	Gas Meter Factor:	1.000	Calibration Date:	Sept 15/95
Nozzle I.D.:	Q1	Nozzle Diameter (in.):	0.45	Calibration Date:	Nov 95
Probe I.D.:	T1-7'	Pitot Coefficient:	0.799	Calibration Date:	Sept 15/95

Equipment Comments: NOZZLE BROKE WHEN INSERTING PROBE INTO 2ND TRAVERSE LOST PART OF NOZZLE IN STACK - REPLACED NOZZLE + CONTINUED.

STACK GAS COMPOSITION

CO_2 (%): ____ O_2 (%): ____ CO (ppm): ____ Other: ____

Impinger 1 (g)	110.7	Assumed H_2O (%):	14
Impinger 2 (g)	76	Filter I.D. #:	SIF7A-101522
Impinger 3 (g)	24.8	Net Filter Wt. (g):	
Impinger 4 (g)	45	Net Probe Wash Wt. (g):	
Impinger 5 (g)	2.6	Imp. Residue Wt. (g):	
Impinger 6 (g)	0.3		
~~XAD-2 Trap~~ (g) 5.6.	24.6		
Total H_2O Condensed (g)	243.5		

Sampling Comments: ____

Process Rate: Normal Load - High Loading

Control Equipment Operation: ESP

Process Comments: -nozzle broke when inserting probe to start 2nd traverse, lost part of nozzle in stack. -Replaced nozzle + continued.

Signature: [signature] Date: 95/11/8

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	Rigo & Rigo
Date:	95-11-17	Test:	T2-MP-A
Sample Location:	STACK 2	Filter I.D.:	5107A - 102522
Pre Weights by:	VA	Post Weights by:	JW

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	BLANK	609.7	449.0	160.7 ✓
2	100ml 5% HNO3 / 10% H2O2	642.3	566.3	76 ✓
3	100ml 5% HNO3 / 10% H2O2	639.6	614.8	24.8 ✓
4	Blank	494.1	489.6	4.5 ✓
5	100 ml KMnO4 / H2SO4	588.9	586.3	2.6 ✓
6	100 ml KMnO4 / H2SO4	605.7	605.4	0.3 ✓
7	Silica	781.8	757.2	24.6 ✓
8	—			
XAD Trap	—			
			Total (g)	243.5 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	147.5	147.5	✓	JA
Post weights	1475	1475	✓	JW

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 11/18/95

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BOVAR-CONCORD Environmental

DATE: 5/11/16 | SAMPLING TRAINS DATA SHEET | PAGE 2 OF 5

Client: Ryothigo | Project #: 5416265 | Sample Location: B Stack | Operators: SL / JM

Run #: T2-MP-A | Traverse #: 1 | Traverse Direction: OUT | Start Time: 12:02 | Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.68	1.5		907.529	419	242	247	55	NA	75	74	1.0
1	3		0.78	1.7	909.557	909.61	418	241	246	47		79	74	1.0
2	6		0.80	1.7	911.781	911.83	419	243	246	44		80	75	1.0
2	9		0.78	1.6	914.029	914.08	419	244	247	42		81	75	1.0
3	12		0.68	1.4	*916.251	916.25	422	245	248	42		82	76	1.0
3	15		0.81	1.7	918.278	918.27	422	246	251	42		82	77	1.0
4	18		0.81	1.7	*920.483	920.48	425	248	250	43		82	77	1.0
4	21		0.81	1.7	922.693	922.72	427	250	249	43		82	77	1.0
5	24		0.80	1.6	*924.933	924.94	426	250	249	45		83	78	1.0
5	27		0.81	1.7	927.139	927.13	426	249	248	45		83	78	1.0
6	30		1.2	2.5	*929.343	929.34	428	248	247	45		83	78	1.0
6	33		1.2	2.5	932.035	932.03	428	248	246	45		84	79	1.0
7	36		1.1	2.4	*934.775	934.75	428	250	247	46		84	79	1.0

Pre test leak check: Rate (cfm) ~~.000~~ .012 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .012 at 10 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmen

.023 .093

DATE: 9/11/18 SAMPLING TRAINS DATA SHEET PAGE 3 OF 5

Client: Rio Tinto Project #: 5411626.05 Sample Location: B Stack Operators: JW/JM

Run #: TEMP-A Traverse #: 1 Traverse Direction: OUT Start Time: 12:02 Finish Time: 13:02

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	39		1.1	2.3	937.33	937.42	427	248	245	46	NA	85	79	1.5
8	42		0.82	1.75	*946.000	940.05	426	248	246	46		85	79	1.5
8	45		0.73	1.5	942.276	942.29	414	247	244	47		85	80	1.5
9	48		0.50	1.1	*944.391	944.44	410	246	246	47		85	80	1.5
9	51		.53	1.1	946.179	946.22	410	246	245	47		85	80	1.5
10	54		.43	.90	*948011	948.05	410	245	245	46		85	80	1.5
10	57		.42	.870	949.66	949.70	407	245	245	46		85	80	1.5
10	60				951.294	951.293								

Pre test leak check: Rate (cfm) .012 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .02 at 16 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environment

DATE: 9/11/18 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: Rizo Hrgo Project #: 5416265 Sample Location: B Stack Operators: JW/SM

Run #: 72-MP-A Traverse #: 2 Traverse Direction: OUT Start Time: 13:45 Finish Time: 14:15

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		.74	1.45		952.387	412	241	242	54	N/A	82	80	1.0
1	3		.74	1.5	954.502	954.46	413	241	240	48		84	80	1.0
2	6		.88	1.8	956.575	956.55	415	241	242	47		85	80	1.0
2	9		0.97	2.2	958.856	958.85	417	242	240	45		86	81	1.0
3	12		0.90	2.0	961.272	961.34	417	243	242	46		86	81	1.0
3	15		0.85	1.75	963.673	963.69	411.0	249	243	47		86	81	1.0
4	18		0.85	1.65	965.957	966.00	415	244	242	48		86	82	1.0
4	21		0.87	1.75	968.267	968.27	414	244	242	49		86	82	1.0
5	24		0.86	1.75	970.563	970.53	414	245	241	49		86	82	1.0
5	27		0.95	2.1	972.81	972.80	415	245	245	49		86	82	1.0
6	30		0.90	2.0	975.196	975.19	414	246	241	49		80	82	1.0
6	33		0.90	1.95	977.523	977.55	414	246	241	50		86	82	1.0
7	36		0.88	1.8	979.883	979.90	416	246	243	50		86	82	1.0

Pre test leak check: Rate (cfm) .009 at 16 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

B:\FORMS\STDS.FRM Leak check after replacing nozzle .008 @ 16" Hg

BOVAR-CONCORD Environment

DATE: 95 / 11 / 18

SAMPLING TRAINS DATA SHEET

Client: Rogo+Rogo Project #: 54116765 Sample Location: B Stack Operators: JD/TM

Run #: T2 MP-A Traverse #: 2 Traverse Direction: OUT Start Time: 13:45 Finish Time: 14:45

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	39		0.80	1.65	982.206	982.21	413	246	244	51	NA	87	82	1.0
8	42		0.79	1.6	*984.409	984.42	413	246	242	51		87	82	1.0
8	45		0.82	1.65	986.65	986.61	413	245	242	50		87	82	1.0
9	48		0.77	1.5	*988.836	988.81	412	244	243	50		87	83	1.0
9	51		0.86	1.75	990.968	990.94	413	245	241	50		87	83	1.0
10	54		0.82	1.65	*993.22	993.22	411	244	238	50		88	83	1.0
10	57		0.88	1.8	995.446	995.44	413	244	243	50		88	83	1.0
10	60				997.746	997.749								

Pre test leak check: Rate (cfm) .009 at 16 inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

Post test leak check: Rate (cfm) ______ at ______ inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

K value calculated by: ______ Checked by: ______ Operator Signature: [signature]

E:\FORMS\STDS.FRM leak chk after replacing nozzle = .008 cfm @ 16" Hg static = -.5

BOVAR-CONCORD Environmental

PROJECT #5416265 DATE: 5/11/17 TEST T2-MP-A

Client: Rhodia Location: B Stack Operator: JW

Sample Type: MS Reference Method: EPA method 29

Modifications: _____

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP		
Static positive or negative		-
Average Temperature		
Estimate % H_2O	14	
How estimated?		MS
Estimate Gas Composition		O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?		
Proper nozzle selected?	✓	
K factor		
Number of sampling points per traverse		10
Probe markings correct?	✓	
Time per point		6
Number of readings per point		2
Barometric Pressure Measured?	✓	
Mercury		
Aneroid		
Other	-	watch
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or		
Quartz	✓	
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or		
Quartz or	✓	
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5716265 DATE: 9/11 TEST 12-mP-A

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	---	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor		
Thermocouple	✓	
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol		
FILTER TYPE		
Glass Fibre		
Quartz	✓	
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	✓	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol		
Thermocouple attached to trap		
XAD-2 Trap covered with foil at all times		

PROJECT # 5916265 DATE: 9/11 TEST TZ-MP-A

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	2	7
Contents #1		Blank
#2		5% HNO3/10% H2O2
#3		" "
#4		Blank
#5		KMnO4 / H2SO4
#6 (IF USED)		" " / S.G.
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications		
Grease used on joints	✓	
Silica gel type		
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate		.012 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	N/A	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel		good
Leak checks at port changes Before		.012 cfm@ 16 "Hg
After		.009 cfm@ 16 "Hg
Final leak race acceptable	✓	.004 cfm@ 15 "Hg
General comments on sampling technique		excellent.
Sample recovery performed on-site?	✓	
Sample recovery performed by		SA
Clean-up area - General Environment		excellent
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

QA/QC CHECKLIST

PAGE 4 OF

PROJECT # 5716665 DATE: 9511 TEST T2MP-A

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	⟷	teflon
Leak free	✓	
Petri Dishes: borosilicate glass		
plastic	✓	
Balance Type	⟷	digital top loader
Calibrated or QC checked	⟷	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		blue/good
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		
Colour of Filter		
Foil Wrapped?	✓	
Probe Rinses		
Acetone		
Other		
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents		
Solvents		
Resin		
Blank Train		
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: Stack B TEST #: T2-MP-A DATE: 95.11.15 PROJECT NO.: 541 6265

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	**Container TS3 Front Half 0.1 N HNO3 Rinse** Final Wt.: 471.8 Initial Wt.: 263.2 Gain: 208.6 Comments:	Brush loose particulate onto filter **Filter TS~~1~~** Seal petri dish with tape Colour: WHEAT Filter #: 5107A	**Container TS4-1 Impinger 4 Contents** Final Wt.: 687.3 Initial Wt.: 263.3 Gain: 424.0	**Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse** Final Wt.: ~~598.2~~ 334.9 Initial Wt.: 262.7 Gain: 72.2 Colour: CLEAR	Rinse with 100 mL 0.1 N HNO3 **Container TSA Impinger 4 Contents** Final Wt.: 363.8 Initial Wt.: 263.7 Gain: 100.1	Rinse 3x with 100 mL Acidified KMnO4 Rinse with 100 mL water **Container 5B Impinger 5 & 6 KMnO4 Content and Rinses** Final Wt.: 709.3 Initial Wt.: 2639 Gain: 445.9 Colour: PURPLE	Place rinsing in Container 5C which contains 200 mL of water **Container 5C HCL Rinse** Final Wt.: ~~Illegible~~ 489.6 Initial Wt.: 263.1 Gain: 226.5 Colour: CLEAR	
Container TS2 Front Half Acetone Rinse Final Wt.: 336.2 Initial Wt.: 263.2 Gain: 72.0 Comments:								

ZENON 102522

Filter maybe low weight due to filter breakage look for weight on probe wash

Train Identification		Blanks	
Train No.:			
HNO3 / H2O2 Batch No.:		Container 9	200 mLs
DI Water Batch No.:		Container 8B	100 mLs
Acetone Batch No.:		Container 7	100 mLs
0.1 N HNO3 Batch No.:		Container 8A	300 mLs
Acidified KMnO4 Batch No.:		Container 10	100 mLs
8 N HCl / Batch No.: DI Water		Container 11	25 mL / 200 mL
Filter Number:		Container 12	* _____

Mark Liquid Level on Containers
Seal and Label Containers
Reagent Blanks Submitted? Yes ____ No ____
Prepare Fresh Acidified KMnO4 Daily ✓

BOVAR-CONCORD Environmental

P_g = 25.40 in Hg

3:30 -- 4:30

METHOD 26
HCl SAMPLING DATA FORM

Company Name	DAVIS COUNTY	Plant Location	UTAH	Source Name	STACK B
Test Date	NOV 18/95	Test Number	T4-HCl-B	Job Number	5416265
Sampling for	HCl	Meter Box	V1 Y-1.001	B.P. mm/inHg	860 mbar

ABSORBING SOL'N	15 ml 0.1 N H_2SO_4	15 ml 0.1 N H_2SO_4	15 ml 0.1 N NaOH	15 ml 0.1 N NaOH	Silica Gel	GAS	1	2	3	4
WEIGHTS	IMP 1	IMP 2	IMP 3	IMP 4	IMP 5	READINGS				
EMPTY						O2				
FILLED FINAL						CO2				
FILLED INITIAL						CO				
DIFFERENCE						TIME				

OPERATOR	JM	Sample Rate (Lpm)	~2	H20 Condensed	
Lk.Chk, (Init.)	.05 cc/min @ 15 in Hg	Lk. Chk. (Final)	cc/min	Probe Purged	(Yes) No

Sample Time	Clock Time	Volume m^3 Desired	Volume m^3 Actual	Vacuum in.Hg	Meter Temp. °C/(°F)	Probe Temp. °C/(°F)	Box Temp. °C/(°F)	Impinger Temp. °C/°F
0	0		149.25	1	72.5	268	245	
10	5		159.95	1	73	269	256	
20	10		170.55	1	73	264	253	
30	15		181.1	1	74	240	269	
40	20		191.5	1	74	290	274	
50	25		202.0	1	73	240	270	
60	30		212.4	1	75.5	295	262	
70	35		222.65	1	75.5	246	259	
80	40		232.4	1	75.5	296	254	
90	45		242.6	1	74	245	250	
100	50		252.85	1	76	290	247	
110	55		263.05	1	74	247	246	
120	60		273.4	1	75.5	296	243	
		AVG/TOT	(124.15)	1	(74.2)	(269)	(256)	

E:\FORMS\HCL.FRM

4.384 ft³

BOVAR-CONCORD Environmental

HCl METHOD 26 SAMPLING TRAIN
RECOVERY DATA FORM

PROJECT NO.: 5416265

LOCATION: STACK B TEST #: T4-HCl-B DATE: 95.11.18

Impingers 1 and 2	Impingers 3 and 4
Weigh impingers Empty contents into container and rinse with DI water	Weigh impingers Empty contents into container and rinse with DI water

Container TS1 Impingers 1 and 2 0.1 N H2SO4 Contents and DI Water Rinses	
Final Wt.:	132.8
Initial Wt.:	32.8
Gain:	100.0

Container TS2 Impingers 3 and 4 0.1 N NaOH Contents and DI Water Rinses	
Final Wt.:	133.8
Initial Wt.:	33.8
Gain:	100.0

Mark Liquid Level	Seal and Label

Train Identification	
Train No.:	T4-HCl-B
0.1 N H2SO4 Batch No.:	ZENON
DI Water Batch No.:	ZENON
0.1 N NaOH Batch No.:	ZENON
Train Loaded By:	JA
Recovered By:	JA
Reagent Blank Submitted: Yes ✓	No _____

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	RIGO & RIGO
Date:	95.11.18	Test:	T9-11C1B
Sample Location:	STACK B	Filter I.D.:	—
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	92.5	88.4	4.1 ✓
2	0.1N H_2SO_4	101.4	96.9	4.5 ✓
3	0.1N H_2SO_4	106.1	105.9	0.2 ✓
4	Blank	71.0	71.0	0 ✓
5	0.1N NaOH	98.8	98.6	0.2 ✓
6	0.1N NaOH	96.9	96.8	0.1 ✓
7	Si	127.8	126.4	1.4 ✓
8				
XAD Trap				
			Total (g)	10.5 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	147.5	147.6	✓	JA
Post weights	147.5	147.6	✓	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.18

SYSTEM CALIBRATION AND DRIFT CALCULATIONS

CLIENT	RIGO+RIGO	DATE	NOV 18/95
PROJECT NUMBER	5416265	TIME START	15:53
SAMPLE LOCATION	STACK	TIME FINISH	19:43
	TEST NUMBER	T3CEMB	

INSTRUMENT SPAN VALUES

OXYGEN	25	%	CARBON DIOXIDE	20	%
SULPHUR DIOXIDE	1000	PPM	CARBON MONOXIDE	1000	PPM
NITROGEN OXIDES	1000	PPM	TOTAL HYDROCARBONS	100	PPM

ITEM	CAL.GAS VALUE	ANAL. CAL.	INITIAL VALUES SYSTEM CAL.	INITIAL VALUES SYSTEM CAL. BIAS (% SPAN)	FINAL VALUES SYSTEM CAL.	FINAL VALUES SYSTEM CAL. BIAS (% SPAN)	DRIFT (% SPAN)
O2 ZERO	0	0.04	0.04	0.0	0.08	0.2	0.2
O2 CAL	9.91	9.92	9.89	-0.1	9.98	0.2	0.4
SO2 ZERO	0	0.28	1.7	0.1	-3	-0.3	-0.5
SO2 SPAN	149	149	145	-0.4	140	-0.9	-0.5
NOX ZERO	0	0.9	1.2	0.0	7.3	0.6	0.6
NOX SPAN	302	300	299	-0.1	306	0.6	0.7
CO2 ZERO	0	0.02	0.04	0.1	0.07	0.3	0.2
CO2 SPAN	7.01	7.03	7.01	-0.1	7.03	0.0	0.1
CO ZERO	0	0.7	0.7	0.0	0.56	-0.0	-0.0
CO SPAN	100	100.3	100.2	-0.0	100.3	0.0	0.0
THC ZERO	0	0.04	0.02	-0.0	-1.6	-1.6	-1.6
THC SPAN	20.1	20.8	20.9	0.1	20.7	-0.1	-0.2

DRIFT CRITERIA <5% SPAN
BIAS CRITERIA <5% SPAN

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO	DATE : 9.18.95
JOBSITE : LAYTON UTAH	RUN : T3-OC-B
REF.No. : 5416265	LOC. : B STACK

RUN TIME : 15:01 TO 17:59

ORGANICS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
ORGANICS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	1.7526 DSm3	61.887 DScf
AVERAGE ISOKINETICITY	99.9 %	

FLUE GAS CHARACTERISTICS

MOISTURE	12.89 %	
TEMPERATURE	209.0 deg C	408.2 deg F
FLOW	47418 DSm3/hr	27909 DScfm
	104127 Am3/hr	61287 Acfm
VELOCITY	20.32 m/s	4000.3 fpm

GAS ANALYSIS	O2	10.85 %
	CO2	9.00 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	29.99 g/gmole D.B.
	MOL. WT.	28.44 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 9.18.95
RUN : T3-OC-B
LOC. : B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	85.8 kPa	25.32 in.Hg
STATIC PRESSURE	-112.1 Pa	-0.45 in.H2O
NOZZLE DIAMETER	5.79 mm	0.2280 in.
PITOT COEFFICIENT	0.796	
METER CORRECTION FACTOR	0.983	

CONDENSATE COLLECTION

RESIN TRAP CONDENSATE	20.8 g
CONDENSATION IN IMPINGER 1	145.3 g
CONDENSATION IN IMPINGER 2	6.5 g
CONDENSATION IN IMPINGER 3	3.8 g
CONDENSATION IN IMPINGER 4	1.4 g
SILICA GEL WEIGHT GAIN	13.0 g
TOTAL MOISTURE GAIN	190.8 g

ORGANICS COLLECTION

FILTER ORGANICS	0.0000 mg
WASHINGS ORGANICS	0.0000 mg
RESIN ORGANICS	0.0000 mg
IMPINGER ORGANICS	0.0000 mg
TOTAL ORGANICS	0.0000 mg

TOTAL SAMPLING TIME	120.0 min.

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 9.18.95
RUN : T3-OC-B
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1													
1	0.0	395	0.600	0.80	92.50	83	247	230	59	66	4.0	1.0	100.5
1	3.0	396	0.600	0.80	94.15	83	248	247	60	55	4.0	1.0	97.5
2	6.0	406	0.820	1.20	95.75	83	250	246	60	49	7.0	2.0	100.3
2	9.0	402	0.600	0.80	97.66	84	250	246	60	49	5.0	2.0	98.9
3	12.0	409	0.880	1.30	99.28	85	250	246	60	49	7.0	3.0	101.8
3	15.0	415	0.940	1.30	101.29	85	251	248	56	48	7.0	3.0	99.7
4	18.0	414	0.750	1.10	103.32	85	252	247	54	47	6.0	4.0	100.5
4	21.0	414	0.800	1.20	105.15	85	251	249	53	46	6.0	4.0	101.1
5	24.0	417	0.960	1.40	107.05	85	251	247	53	46	7.0	5.0	100.7
5	27.0	417	0.960	1.40	109.12	85	252	248	53	45	7.0	5.0	100.7
6	30.0	417	1.100	1.60	111.19	85	252	247	54	45	8.0	6.0	102.4
6	33.0	420	1.200	1.60	113.44	85	252	247	54	45	8.0	6.0	100.8
7	36.0	419	0.900	1.30	115.75	85	252	247	55	45	7.0	7.0	101.1
7	39.0	418	0.900	1.20	117.76	85	253	247	55	46	7.0	7.0	99.0
8	42.0	413	0.820	1.20	119.73	85	253	248	56	46	6.0	8.0	100.3
8	45.0	411	0.940	1.30	121.64	85	252	246	56	47	7.0	8.0	96.0
9	48.0	391	0.550	0.70	123.60	85	252	246	56	48	5.0	9.0	101.1
9	51.0	390	0.550	0.70	125.20	85	252	246	56	48	5.0	9.0	99.8
10	54.0	387	0.550	0.70	126.78	85	250	246	58	48	5.0	10.0	99.6
10	57.0	386	0.550	0.70	128.36	85	250	247	59	49	5.0	10.0	97.1
	60.0				129.90								
TRAVERSE NO. 2													
1	0.0	402	0.600	0.70	30.37	82	249	250	66	57	5.0	1.0	96.9
1	3.0	406	0.600	0.80	31.95	83	250	249	65	48	6.0	1.0	98.1
2	6.0	405	0.660	0.85	33.55	83	251	250	65	46	6.0	2.0	100.5
2	9.0	405	0.750	1.00	35.27	84	249	248	65	45	7.0	2.0	101.3
3	12.0	410	1.000	1.50	37.12	85	250	249	60	45	8.0	3.0	101.8
3	15.0	410	0.840	1.20	39.26	85	250	249	56	45	7.0	3.0	103.1
4	18.0	409	0.800	1.10	41.25	85	251	247	55	46	6.0	4.0	98.6
4	21.0	410	0.840	1.20	43.11	86	253	249	56	47	6.0	4.0	98.2
5	24.0	411	0.900	1.30	45.01	86	253	248	55	47	7.0	5.0	99.5
5	27.0	415	1.100	1.60	47.00	86	253	248	55	47	8.0	5.0	99.8
6	30.0	412	0.840	1.20	49.20	88	254	249	56	49	6.0	6.0	99.1
6	33.0	412	0.840	1.20	51.12	88	252	248	56	48	6.0	6.0	99.6
7	36.0	412	0.860	1.30	53.05	88	253	250	56	49	7.0	7.0	100.5

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 9.18.95
RUN : T3-OC-B
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	413	0.900	1.40	55.02	88	253	249	58	50	7.0	7.0	100.3
8	42.0	410	0.720	1.00	57.03	89	253	249	58	51	6.0	8.0	98.3
8	45.0	405	0.660	0.90	58.80	89	252	249	58	52	5.0	8.0	97.2
9	48.0	410	0.860	1.30	60.48	89	252	248	58	52	7.0	9.0	101.6
9	51.0	412	0.860	1.30	62.48	89	253	248	58	52	7.0	9.0	101.8
10	54.0	411	0.820	1.20	64.48	89	253	249	59	52	6.0	10.0	99.4
10	57.0	409	0.820	1.20	66.39	89	252	245	60	52	6.0	10.0	98.8
	60.0				68.29								
		408	0.798	1.14		85	251	247	58	49	6.3		99.9

ISOKINETIC TEST DATA FORM

Sample Type: Organics Reference Method: EPA M23 Page 1 of 5

Client:	Rigo & Rigo	City, Province:	Layton, UTAH
Project Number:	5416265	Test Number:	T3-OCB
Sample Location:	B Stack	Date:	Nov 16/95
Start Time:	3:01 pm	Finish Time:	5:59 pm
Barometric Press. (in Hg):	25.32	Stack Press(in H_2O):+ or -:	-0.45
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes (No)

Sample Box Number:	T1	Gas Meter Factor:	0.983	Calibration Date:	Sept 14/95
Nozzle I.D.:	T1-2	Nozzle Diameter (in.):	0.228	Calibration Date:	Nov 16/95
Probe I.D.:	T2-7	Pitot Coefficient:	0.796	Calibration Date:	Sept 1/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): _____ O_2 (%): _____ CO (ppm): _____ Other: _____

Impinger 1 (g)	145.3	Assumed H_2O (%):	19
Impinger 2 (g)	6.5	Filter I.D. #:	—
Impinger 3 (g)	3.8	Net Filter Wt. (g):	—
Impinger 4 (g)	1.4	Net Probe Wash Wt. (g):	—
Impinger 5 (g) S.G.	13.0	Imp. Residue Wt. (g):	—
~~Impinger 6 (g)~~ Coil	20.8 ←		
XAD-2 Trap (g)			
Total H_2O Condensed (g)	190.8		

Sampling Comments: Train #01 (Reused after T1-OCA)
Trap 13

Process Rate: _____

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: Nov 16/95

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MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	Rigo + Rigo
Date:	Nov 16/95	Test:	T3-OC B
Sample Location:	B Stack	Filter I.D.:	—
Pre Weights by:	HVB	Post Weights by:	HVB

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	MT	570.5	425.2	145.3 ✓
2	Root H_2O	597.8	591.3	6.5 ✓
3	Root H_2O	603.4	599.6	3.8 ✓
4	MT	491.8	490.4	1.4 ✓
5	S.G.	820.0	807.0	13.0 ✓
~~6~~				
~~7~~				
~~8~~ Coil	} together with bar foil, etc.	} 772.0	} 751.2	} 20.8 ← check This Input 2.8
XAD Trap				
			Total (g)	190.8

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: Train 01 5.6 75% spent
Trap 13

Signature: Date: Nov 16/95

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BOVAR-CONCORD Environmental

DATE: 10/11/95

SAMPLING TRAINS DATA SHEET

Client: Riga + Riga | Project #: 5416265 | Sample Location: B Stack | Operators: HUB

Run #: T3-OCB | Traverse #: 1 | Traverse Direction: North | Start Time: 3:01 pm | Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		0.60	0.80	.547	92.50	395	247	230	66	59	84	82	4
	3		0.60	0.80	.547	94.15	396	248	247	55	60	84	82	4
2	6		0.82	1.20	.639	95.75	406	250	246	49	60	84	82	7
	9		0.60	0.80	.547	97.66	402	250	246	49	60	86	82	5
3	12		0.88	1.30	.662	99.28	409	250	246	49	60	87	82	7
	15		0.94	1.3	.684	101.29	415	251	248	48	56	88	82	7
4	18		0.75	1.0	.611	103.32	414	252	247	47	54	88	82	6
	21		0.80	1.2	.631	105.15	414	251	249	46	53	88	82	6
5	24		0.96	1.4	.692	107.05	417	251	247	46	53	88	82	7
	27		0.96	1.4	.692	109.12	417	252	248	45	53	88	82	7
6	30		1.10	1.6	.740	111.19	417	252	247	45	54	88	82	8
	33		1.20	1.8	.773	113.44	420	252	247	45	54	82	82	8

Pre test leak check: Rate (cfm) 0.005 at 15 inches Hg (Vacuum) Leak Volume Start: 92.16 Leak Volume End: 92.50

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 12/11/95

SAMPLING TRAINS DATA SHEET

Client: Rigo + Rigo | Project #: 5416265 | Sample Location: B Stack | Operators: HUB

Run #: T3-OCB | Traverse #: 1 | Traverse Direction: North | Start Time: _____ | Finish Time: 4:01 pm

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.90	1.3	.660	115.75	419	252	247	45	55	88	82	7
	39		0.90	1.2	.660	117.76	418	253	247	46	55	88	82	7
8	42		0.87	1.2	.639	119.73	413	253	248	46	56	88	82	6
	45		0.94	1.3	.684	121.64	411	252	246	47	56	88	82	7
9	48		0.55	0.7	.524	123.66	391	252	246	48	56	88	82	5
	51		0.55	0.7	.524	125.20	390	252	246	48	56	88	82	5
10	54		0.55	0.7	.524	126.78	387	250	246	48	58	88	82	5
	57		0.55	0.7	.524	128.36	386	250	247	49	59	88	82	5
	60					129.90								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.038 at 15 inches Hg (Vacuum) Leak Volume Start: 129.90 Leak Volume End: 130.12

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR CONCORD Environmental

DATE: 12/11/95 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: HUB

Run #: T3-0C8 Traverse #: 2 Traverse Direction: East Start Time: 4:59 pm Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.60	0.80	.547	30.37	402	249	250	57	66	82	81	5
	3		0.60	0.80	.547	31.95	406	250	249	48	65	84	82	6
2	6		0.66	0.85	.573	33.55	405	251	250	46	65	84	82	6
	9		0.75	1.0	.611	35.27	405	249	248	45	65	85	82	7
3	12		1.00	1.5	.706	37.12	410	250	249	45	60	87	82	8
	15		0.84	1.2	.647	39.26	410	250	249	45	56	88	82	7
4	18		0.80	1.1	.631	41.25	409	251	247	46	55	88	82	6
	21		0.84	1.2	.647	43.11	410	253	249	47	56	89	83	6
5	24		0.90	1.3	.670	45.01	411	253	248	47	55	89	83	7
	27		1.1	1.6	.740	47.00	415	253	248	47	55	89	83	8
6	30		0.84	1.2	.647	49.20	412	254	249	49	56	91	84	6
	33		0.84	1.2	.647	51.12	412	252	248	48	56	91	84	6

Pre test leak check: Rate (cfm) 0.008 at 15 inches Hg (Vacuum) Leak Volume Start: 30.12 Leak Volume End: 30.37

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: HUB

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BOVAR-CONCORD Environmental

DATE: 12/11/95

SAMPLING TRAINS DATA SHEET

Client: Rigo & Rigo Project #: 5416265 Sample Location: B Stack Operators: HVB

Run #: T3-OCB Traverse #: 2 Traverse Direction: East Start Time: _____ Finish Time: 5:59 p.m

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.86	1.3	.655	53.05	412	253	250	49	56	91	84	7
	39		0.90	1.4	.670	55.02	413	253	249	50	58	91	84	7
8	42		0.72	1.0	.599	57.03	410	253	249	51	58	92	85	6
	45		0.66	0.9	.573	58.80	405	252	249	52	58	92	85	5
9	48		0.86	1.3	.655	60.48	410	252	248	52	59	92	86	7
	51		0.86	1.3	.655	62.48	412	253	248	52	58	92	86	7
10	54		0.82	1.2	.639	64.48	411	253	249	52	59	92	86	6
	57		0.82	1.2	.639	66.39	409	252	245	52	60	92	86	6
	60					68.29								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.08 at 15 inches Hg (Vacuum) Leak Volume Start: 68.29 Leak Volume End: 68.58

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

QA/QC CHECKLIST

PROJECT # 5416265 DATE: Nov 19/95 TEST T3-OCB

Client: Rigo + Rigo Layton UTAH Location: B Stack Operator: HUR

Sample Type: Organics Reference Method: EPA M23

Modifications: Recovered using Environment Canada → acetone/DCM, toluene proving rinse Train 01 (reused following T1-OCA) Trap 13

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	----	0.86 in H_2O
Static positive or negative	----	-0.75 in H_2O
Average Temperature	----	400°F
Estimate % H_2O	----	14%
How estimated? T1-OCA results	----	~~[illegible]~~
Estimate Gas Composition	----	O_2% 10 CO_2(%) 10 CO(ppm) 40
How Estimated? T1-CEMA	----	~~[illegible]~~
Proper nozzle selected?	✓	
K factor	----	~~[illegible]~~
Number of sampling points per traverse	----	10
Probe markings correct?	✓	
Time per point	----	6
Number of readings per point	----	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other Watch	✓	
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	Proving rinse after T2-OCA
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	Proving rinse after T2-OCA
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5716265 DATE: Nov 10/95 TEST T3-OCB

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	+++	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type	K	
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	Proving of Train 01 after T1-OCA
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	Proving of Train 01 after T1-OCA
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 5716265 DATE: Nov 10/95 TEST T3-OCB

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	Proving of Train 01 after T1-OCA
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	MT
#2	⟷	RODI
#3	⟷	RODI
#4	⟷	MT
#5	⟷	S.G
~~#6~~	⟷	—
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	⟷	
Grease used on joints	X	
Silica gel type	⟷	
New?		
Used?	✓	50% spent ~~after~~ before test
Pre Test Leak Check		
Performed	✓	
Rate	⟷	0.005 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	50% spent before test
Leak checks at port changes Before	⟷	0.005 cfm@ 15 "Hg
After	⟷	0.005 cfm@ 15 "Hg
Final leak race acceptable	⟷	0.005 cfm@ 15 "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	RB/JA
Clean-up area - General Environment	⟷	Good
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 5416265 DATE: Nov 10/95 TEST T3-OCB

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	---	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass	X	cleaned foil in plastic bag
plastic		
Balance Type	---	top loader
Calibrated or QC checked	---	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour	✓	75% spent
Weighed	✓	
Filter Handling		
Tweezers used?	✓	Teflon
Condition?		Good
Colour of Filter		off white
Foil Wrapped?	✓	
Probe Rinses		
Acetone /DCM	✓	
Other Toluene	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

#3

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: B- STACK TEST #: T3- OCB DATE: NOV 18/95 PROJECT NO.: 541-6265

Nozzle, Probe Liner Front Half Filter Holder, back half condenser coil All equipment	Filter	Back Half Filter Holder and Condenser Coil, NOZZLE FRONT HALF FILTER All equipment	XAD Resin	Impingers & HPLC Rinse	Back Half Rinse
Wash and brush 3x each ~~with hexane~~ DCM and acetone. Rinse 3x with ~~with hexane~~ DCM and and acetone.	Remove and place on pre-cleaned foil fold in half and place in ~~petri dish~~. Ziploc bag	**Weigh Coil & Record Weight** ~~Soak 5 minutes each with hexane and acetone. Rinse 3x with hexane and acetone.~~ TOLUENE PROOF	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into container #4. ~~Rinse 3x with HPLC water.~~	Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with ~~hexane~~ DCM and acetone.

~~Container TS1~~ TS2 ~~Front Half~~ Acetone ~~Hexane~~ Rinse DCM	~~Container TS2~~ TS1 Filter	Container TS3 ~~Back Half Filter and Condenser Coil~~	Container TS4 XAD Resin	Container TS5 Impinger Contents	~~Container TS3~~ TS2 Back Half Rinse
Final Wt.: 565.1	Filter ID: T3-OCB	Final Wt.: 443.5	**Wrap in Foil**	Final Wt.: 650.2	Final Wt.:
Initial Wt.: 265.3	Colour: Off white	Initial Wt.: 265.4	XAD: 046629	Initial Wt.: 265.4	Initial Wt.:
Gain: 299.8		Gain: 178.4	Colour: off white trap 13	Gain: 384.8	Gain:
		Colour: Green		Colour:	Colour:

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	03
~~HPLC~~ Batch No.: ZENON	95/10/26
Acetone Batch No.: CALEDON	14123
~~Hexane~~ DCM Batch No.: CALEDON	16700
Filter Batch No.: ZENON 95/10/26	XAD No.:
Train Assembled By:	HVB
Train Recovered By:	RB

Reagent Blanks Collected?	Yes
Combined Acetone/~~Hexane~~ DCM	
~~Combined Glycol~~/Water	
Blank Train Collected?	No
Comments:	
Trace of H2O + toluene in TS3 container	

EPSREC.DRW-May 95

BOVAR-CONCORD Environmental

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO	DATE : 95 11 18
JOBSITE : LAYTON UTAH	RUN : T3-MP-B
REF.No. : 5416265	LOC. : B STACK

RUN TIME : 17:23 TO 19:40

METALS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
METALS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	2.1273 DSm3	75.116 DScf
AVERAGE ISOKINETICITY	104.4 %	

FLUE GAS CHARACTERISTICS

MOISTURE	12.85 %	
TEMPERATURE	210.1 deg C	410.3 deg F
FLOW	48066 DSm3/hr	28291 DScfm
	105441 Am3/hr	62061 Acfm
VELOCITY	20.58 m/s	4050.8 fpm

GAS ANALYSIS	O2	10.85 %
	CO2	9.00 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	29.99 g/gmole D.B.
	MOL. WT.	28.45 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 18
RUN : T3-MP-B
LOC. : B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.0 kPa	25.40 in.Hg
STATIC PRESSURE	-124.5 Pa	-0.50 in.H2O
NOZZLE DIAMETER	6.20 mm	0.2440 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	68.1 g
CONDENSATION IN IMPINGER 2	99.4 g
CONDENSATION IN IMPINGER 3	34.6 g
CONDENSATION IN IMPINGER 4	7.8 g
CONDENSATION IN IMPINGER 5	5.4 g
CONDENSATION IN IMPINGER 6	0.8 g
SILICA GEL WEIGHT GAIN	14.7 g
TOTAL MOISTURE GAIN	230.8 g

METALS COLLECTION

FILTER METALS	0.0000 mg
WASHINGS METALS	0.0000 mg
IMPINGER METALS	0.0000 mg
TOTAL METALS	0.0000 mg

TOTAL SAMPLING TIME 120.0 min.

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 18
RUN : T3-MP-B
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	408	0.500	1.10	8.85	80	228	242	48	1.0	1.0	108.1
1	3.0	407	0.570	1.40	10.64	83	233	243	41	1.0	1.0	108.1
2	6.0	401	0.520	1.10	12.56	84	242	244	40	1.0	2.0	107.7
2	9.0	406	0.530	1.00	14.40	84	245	245	40	1.0	2.0	104.0
3	12.0	407	0.830	1.70	16.19	85	245	244	40	1.0	3.0	105.1
3	15.0	403	0.830	1.65	18.45	86	244	241	40	1.0	3.0	103.8
4	18.0	409	0.810	1.60	20.69	86	244	241	42	1.0	4.0	104.4
4	21.0	410	0.840	1.65	22.91	86	244	241	43	1.0	4.0	103.9
5	24.0	412	0.980	2.20	25.16	87	243	241	43	1.0	5.0	104.9
5	27.0	413	0.950	2.15	27.61	87	244	243	44	1.0	5.0	107.9
6	30.0	414	0.810	1.60	30.09	88	244	241	45	1.0	6.0	106.6
6	33.0	416	0.840	1.70	32.36	88	243	241	45	1.0	6.0	103.9
7	36.0	416	0.650	1.30	34.61	89	242	240	45	1.0	7.0	103.8
7	39.0	415	0.630	1.15	36.59	89	241	239	46	1.0	7.0	101.0
8	42.0	416	0.620	1.15	38.49	89	240	239	46	1.0	8.0	100.3
8	45.0	416	0.640	1.25	40.36	89	241	239	46	1.0	8.0	101.9
9	48.0	416	0.630	1.25	42.29	89	242	240	46	1.0	9.0	102.6
9	51.0	415	0.730	1.40	44.22	89	242	241	47	1.0	9.0	103.8
10	54.0	412	0.580	1.20	46.32	90	241	240	47	1.0	10.0	103.3
10	57.0	412	0.740	1.45	48.19	90	241	244	48	1.0	10.0	103.7
	60.0				50.31							
TRAVERSE NO. 2												
1	0.0	405	0.730	1.40	41.03	88	238	228	47	1.0	1.0	101.9
1	3.0	406	0.800	1.65	43.10	89	239	230	45	1.0	1.0	103.3
2	6.0	405	0.780	1.60	45.30	90	240	229	45	1.0	2.0	102.6
2	9.0	406	0.840	1.75	47.46	90	240	235	45	1.0	2.0	103.1
3	12.0	407	0.980	2.20	49.71	90	241	238	46	1.0	3.0	107.4
3	15.0	408	1.000	2.15	52.24	91	242	232	47	1.0	3.0	103.8
4	18.0	411	1.100	2.15	54.71	91	242	230	48	1.0	4.0	105.4
4	21.0	409	0.880	1.95	57.34	91	242	229	49	1.0	4.0	103.3
5	24.0	407	0.850	1.75	59.65	91	241	234	49	1.0	5.0	108.6
5	27.0	408	0.850	1.65	62.04	91	241	235	50	1.0	5.0	102.7
6	30.0	409	0.980	2.05	64.30	91	242	237	50	1.0	6.0	103.0
6	33.0	409	0.930	1.95	66.73	92	242	236	50	1.0	6.0	103.0
7	36.0	409	0.940	2.00	69.10	92	243	236	51	1.0	7.0	104.2

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 18
RUN : T3-MP-B
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	411	1.000	2.20	71.51	92	243	238	51	1.0	7.0	107.1
8	42.0	413	1.000	2.10	74.06	92	243	237	51	1.0	8.0	103.8
8	45.0	415	1.100	2.15	76.53	92	242	239	52	1.0	8.0	103.9
9	48.0	416	1.100	2.15	79.12	92	242	240	53	1.0	9.0	104.7
9	51.0	411	1.000	2.10	81.73	92	242	240	53	1.0	9.0	104.5
10	54.0	412	0.940	2.00	84.22	92	243	238	54	1.0	10.0	104.8
10	57.0	409	0.910	1.95	86.64	92	242	240	54	1.0	10.0	104.2
	60.0				89.01							
		410	0.815	1.70		89	241	238	47	1.0		104.4

ISOKINETIC TEST DATA FORM

Sample Type: MS Reference Method: EPA Method 29 Page 1 of 5

Client:	Kiewit	City, Province:	Layton, Utah
Project Number:	541626.5	Test Number:	TJ-MP-8
Sample Location:	B Stack	Date:	9/11/95
Start Time:	17:23	Finish Time:	19:40
Barometric Press. (in Hg):	25.4 "Hg	Stack Press(in H_2O): + or -:	-.5
Stack Diameter (in.):	53	Length x Width:	/ x /
Stack Height (ft):	116	Cyclonic Flow:	Yes No ✓

Sample Box Number:	T3	Gas Meter Factor:	1.006	Calibration Date:	Sept/95
Nozzle I.D.:	QR	Nozzle Diameter (in.):	~~.375~~ .244	Calibration Date:	Nov 16/95
Probe I.D.:	T1-7'	Pitot Coefficient:	~~0.7818~~ 0.848	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): _____ 0_2 (%): _____ CO (ppm): _____ Other: _____

Impinger 1 (g)	68.1	Assumed H_2O (%):	14
Impinger 2 (g)	99.4	Filter I.D. #:	BE 5108A ZENON 10 25 23
Impinger 3 (g)	34.6	Net Filter Wt. (g):	
Impinger 4 (g)	7.8	Net Probe Wash Wt. (g):	
Impinger 5 (g)	5.4	Imp. Residue Wt. (g):	
Impinger 6 (g)	0.8		
~~XAD-2 Trap~~ (g) S.G.	14.7		
Total H_2O Condensed (g)	230.8		

Sampling Comments: Train 3

Process Rate: Normal ~~Load~~ TEMP - High Loading

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: 9/11/95

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	Rigo & Rigo
Date:	95.11	Test:	T3 MP-B / HB
Sample Location:	Stack B	Filter I.D.:	Bovar 5108A
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	536.5	468.4	68.1 ✓
2	100 ml 5% HNO_3/10% H_2O_2	682.2	582.8	99.4 ✓
3	100 ml 5% HNO_3/10% H_2O_2	644.0	609.4	34.6 ✓
4	Blank	500.5	492.7	7.8 ✓
5	100 ml $KMnO_4/H_2SO_4$	583.7	578.3	5.4 ✓
6	100 ml $KMnO_4/H_2SO_4$	601.5	600.7	0.8 ✓
7	Silica Gel	780.5	765.8	14.7 ✓
8				
XAD Trap				
			Total (g)	230.8 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	147.6	147.5	✓	JA
Post weights	147.5	147.6	✓	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: __________

Signature: [signature]

Date: 95.11.18

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BOVAR-CONCORD Environmental

DATE: 9/11/18 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Ryobi Nisso Project #: 5416265 Sample Location: B Stack Operators: JW/Tm

Run #: T3-MPB Traverse #: 1 Traverse Direction: E/W Start Time: 17:23 Finish Time: 18:23

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.50	1.1		998.847	408	228	242	48	NA	81	79	1.0
1	3		.57	1.4	000.586	000.64	407	233	243	41		85	80	1.0
2	6		0.52	1.1	+ 2.497	2.56	401	242	244	40		87	81	1.0
2	9		0.53	1.0	4.334	4.40	406	245	245	40		87	81	1.0
3	12		0.83	1.7	+ 6.191	6.19	407	245	244	40		88	82	1.0
3	15		0.83	1.65	8.43	8.45	403	244	241	40		89	82	1.0
4	18		0.81	1.6	+ 10.69	10.69	409	244	241	42		87	83	1.0
4	21		0.84	1.65	12.903	12.91	410	244	241	43		89	83	1.0
5	24		0.98	2.2	+ 15.163	15.16	412	243	241	43		90	84	1.0
5	27		0.95	2.15	17.394	17.61	413	244	243	44		90	84	1.0
6	30		0.81	1.6	+ 20.000	20.09	414	244	241	45		91	85	1.0
6	33		0.84	1.7	22.303	22.36	416	243	241	45		91	85	1.0
7	30		0.65	1.3	+ 24.613	24.61	416	242	240	45		91	86	1.0

Pre test leak check: Rate (cfm) .005 at 18 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .004 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 95 / 11 / 18

SAMPLING TRAINS DATA SHEET

Client: [illegible] Project #: 5410265 Sample Location: B Stack Operators: SW/JM

Run #: T3-MP-13 Traverse #: 1 Traverse Direction: OUT Start Time: 17:23 Finish Time: 18:23

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	39		0.63	1.15	26.592	26.59	415	241	239	46	N/A	91	86	1.0
8	42		0.62	1.15	*28.542	28.49	416	240	239	46		91	86	1.0
8	45		0.64	1.25	30.426	30.36	416	241	239	46		91	86	1.0
9	48		0.63	1.25	*32.327	32.29	416	242	240	46		92	86	1.0
9	51		0.73	1.4	34.242	34.22	415	242	241	47		91	86	1.0
10	54		0.58	1.2	*36.321	36.32	412	241	240	47		92	87	1.0
10	57		0.74	1.45	38.193	38.19	412	242	244	48		92	87	1.0
10	60				40.305	40.305								

Pre test leak check: Rate (cfm) .005 at 18 inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

Post test leak check: Rate (cfm) .004 at 15 inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

K value calculated by: ______ Checked by: ______ Operator Signature: [signature]

BOVAR-CONCORD Environmental

DATE: 9/11/17 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: Rio Nizo Project #: 5416265 Sample Location: B Stack Operators: JW/JM

Run #: TB-MP-B Traverse #: 2 Traverse Direction: OUT Start Time: 18:40 Finish Time: 19:40

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.73	1.4		41.034	405	238	229	47	NA	88	87	1.0
1	3		0.80	1.45	43.135	43.10	406	239	230	45		91	87	1.0
2	6		0.78	1.6	45.299	45.30	405	240	229	45		92	87	1.0
2	9		0.84	1.75	47.471	47.46	400	240	235	45		92	87	1.0
3	12		.98	2.2	49.713	*49.71	407	241	238	46		93	87	1.0
3	15		1.0	2.15	52.144	52.24	408	242	232	47		93	88	1.0
4	18		1.1	2.5	54.699	*54.71	411	242	230	48		93	89	1.0
4	21		.88	1.95	57.29	57.34	409	242	229	49		93	89	1.0
5	24		.85	1.75	59.646	*59.65	407	241	234	49		93	89	1.0
5	27		.85	1.65	61.917	62.04	408	241	235	50		93	89	1.0
6	30		.98	2.05	64.357	*64.30	409	242	237	50		93	89	1.0
6	33		.93	1.95	66.734	66.73	409	242	236	50		94	89	1.0
7	36		.94	2.0	69.101	*69.10	409	243	230	51		94	89	1.0

Pre test leak check: Rate (cfm) .005 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .05 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR CONCORD Environmental

DATE: 95/11/18

SAMPLING TRAINS DATA SHEET

Client: Rgot/Ligo   Project #: 5416265   Sample Location: B Stack   Operators: JW/SM

Run #: T3-MP-B   Traverse #: 2   Traverse Direction: OUT   Start Time: 18:40   Finish Time: 19:40

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	39		1.0	2.2	71.518	71.51	411	243	238	51	N/A	94	89	1.0
8	42		1.0	2.1	*74.004	74.06	413	243	237	51		94	89	1.0
8	45		1.1	2.15	76.554	76.53	415	242	239	52		94	90	1.0
9	48		1.1	2.15	*79.145	79.12	416	242	240	53		94	90	1.0
9	51		1.0	2.10	81.735	81.73	411	242	240	53		94	90	1.0
10	54		0.94	2.0	*84.274	84.22	412	243	238	54		94	90	1.0
10	57		0.91	1.95	86.638	86.64	409	242	240	54		93	90	1.0
10	60				89.019	89.006								

Pre test leak check: Rate (cfm) .005 at 15 inches Hg (Vacuum)   Leak Volume Start: ______   Leak Volume End: ______

Post test leak check: Rate (cfm) .005 at 15 inches Hg (Vacuum)   Leak Volume Start: ______   Leak Volume End: ______

K value calculated by: ______   Checked by: ______   Operator Signature: [signature]

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: 9/11/18 TEST T3-MP-B

Client: Kings & Kings Location: Layton, Utah Operator: SW

Sample Type: MS Reference Method: EPA M29

Modifications: _____

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟿	
Static positive or negative	⟿	-
Average Temperature	⟿	
Estimate % H_2O	⟿	14
How estimated?	⟿	MS
Estimate Gas Composition	⟿	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	⟿	Com
Proper nozzle selected?	✓	
K factor	⟿	
Number of sampling points per traverse	⟿	10
Probe markings correct?	✓	
Time per point	⟿	10
Number of readings per point	⟿	2
Barometric Pressure Measured?	✓	
Mercury		
Aneroid		
Other		watch
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or		
Quartz	✓	
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?		yes
PROBE LINER:		
Borosilicate or		
Quartz or	✓	
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5411265 DATE: 95118 TEST T3-MP-B

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	----	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol		
FILTER TYPE		
Glass Fibre		
Quartz	✓	
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	✓	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol		
Thermocouple attached to trap	N/A	
XAD-2 Trap covered with foil at all times		

PROJECT # 5[illegible]265 DATE: 9/11/18 TEST T3-MF-B

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	7	
Contents #1		~~100mL 5%HNO3 / 10% H2O2~~ Blank
#2		" " 100mL 5%HNO3 / 10% H2O2
#3		~~Blank~~ " "
#4		100mL KMnO4 / H2SO4 Blank
#5		" ~~Blank~~ 100mL KMnO4 / H2SO4
#6 / #7		#6 100mL KMnO4 / H2SO4 #7 SiO2
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications		
Grease used on joints	✓	
Silica gel type		
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate		.005 cfm@ 18 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	Y	
Sorbent trap kept at ≤68°F	N/A	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel		good
Leak checks at port changes Before		.004 cfm@ 15 "Hg
After		.005 cfm@ 15 "Hg
Final leak race acceptable	✓	.005 cfm@ 15 "Hg
General comments on sampling technique		
Sample recovery performed on-site?	✓	
Sample recovery performed by		TA
Clean-up area - General Environment		
Brushes: Nylon bristle		
Other	✓	
Wash Bottles: Glass		

QA/QC CHECKLIST

PROJECT # 5416265 DATE: 95/11/8 TEST TB-MP-BB

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	✓	teflon
Leak free	✓	
Petri Dishes: borosilicate glass		
plastic	✓	
Balance Type	✓	digital top loader
Calibrated or QC checked	✓	Actual 1425 (g) Measured 1425 (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		Blue/DARK
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		
Colour of Filter		
Foil Wrapped?		
Probe Rinses		
Acetone	✓	
Other		
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin		
Blank Train		
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: STACK B TEST #: ~~T3-MP-A~~ T3-MP-B HMB DATE: 05-11-15 PROJECT NO.: 5916265

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	**Container TS3 Front Half 0.1 N HNO3 Rinse** Final Wt.: 465.5 Initial Wt.: 262.3 Gain: 203.2 Comments:	Brush loose particulate onto filter	**Container TS4-1 Impinger 4 Contents** Final Wt.: 705.7 Initial Wt.: 262.3 Gain: 443.4	**Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse** Final Wt.: 491.9 Initial Wt.: 262.8 Gain: 228.6 Colour: CLEAR	Rinse with 100 mL 0.1 N HNO3	Rinse 3x with 100 mL Acidified KMnO4	Place rinsing in Container 5C which contains 200 mL of water	
Container TS2 Front Half Acetone Rinse Final Wt.: 341 Initial Wt.: 262.3 Gain: 78.7 Comments:		**Filter TS2** Seal petri dish with tape Colour: DARK CREAMY Filter #: 5109A ZENON 102520			**Container TSA Impinger 4 Contents** Final Wt.: 383.9 Initial Wt.: 262.7 Gain: 121.2	Rinse with 100 mL water	**Container 5C HCL Rinse** Final Wt.: 796.7 Initial Wt.: 262.2 Gain: 534.5 Colour: CLEAR	
						Container 5B Impinger 5 & 6 KMnO4 Content and Rinses Final Wt.: 705.9 Initial Wt.: 262.2 Gain: 443.7 Colour: PURPLE		

Train Identification	Blanks	
Train No.:		
HNO3 / H2O2 Batch No.:	Container 9	200 mLs
DI Water Batch No.:	Container 8B	100 mLs
Acetone Batch No.:	Container 7	100 mLs
0.1 N HNO3 Batch No.:	Container 8A	300 mLs
Acidified KMnO4 Batch No.:	Container 10	100 mLs
8 N HCl / Batch No.: DI Water	Container 11	25 mL / 200 mL
Filter Number:	Container 12	*

Mark Liquid Level on Containers
Seal and Label Containers
Reagent Blanks Submitted? Yes ____ No ____
Prepare Fresh Acidified KMnO4 Daily ____

if filter is lost look in probe wash ← filter crumbling hard to recover

BOVAR-CONCORD Environmental

NOVEMBER 19, 1995

TIME ON 14:59

METHOD 26
HCl SAMPLING DATA FORM

$D_N = 29.47$

Company Name	DAVIS COUNTY	Plant Location	LAYTON UTAH	Source Name	STACK B
Test Date	NOV 19/95	Test Number	T6-HCl-B	Job Number	5416265
Sampling for	HCl	Meter Box	Y1 K=1.01	B.P. mm/inHg	862 mbar

ABSORBING SOL'N	15 ml 0.1 N H_2SO_4	15 ml 0.1 N H_2SO_4	15 ml 0.1 N NaOH	15 ml 0.1 N NaOH	Silica Gel	GAS	1	2	3	4
WEIGHTS	IMP 1	IMP 2	IMP 3	IMP 4	IMP 5	READINGS				
EMPTY						O2				
FILLED FINAL						C02				
FILLED INITIAL						CO				
DIFFERENCE						TIME				

OPERATOR	JM	Sample Rate (Lpm)	~2	H20 Condensed		
Lk.Chk, (Init.)	0 cc/min	Lk. Chk. (Final)	0 cc/min	Probe Purged	(Yes)	No)

Sample Time	Clock Time	Volume ~~m³~~ L Desired	Volume ~~m³~~ L Actual	Vacuum in.Hg	Meter Temp. °C/°F	Probe Temp. °C/°F	Box Temp. °C/°F	Impinger Temp. °C/°F
0	0		442.65	1	85	249	237	
10	5		453.2	1	85	305	244	
20	10		463.8	1	85.5	268	248	
30	15		474.2	1	85.5	303	254	
40	20		484.6	1	86	274	258	
50	25		494.6	1	86	300	260	
60	30		504.6	1	85.5	312	261	
70	35		514.65	1	85	330	263	
80	40		524.7	1	85	272	265	
90	45		534.7	1	84.5	225	266	
100	50		544.8	1	85	295	266	
110	55		554.4	1	82.5	230	267	
120	60		564.95	1	82	326	266	
	Tot/Avg		122.3	1	84.8	283.76	258	

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* NOTE: AIR LINE BLEW @ 15:05 TOLD BY RIGO TO KEEP TESTING

TIME OFF 15:59

4,318 ft³

BOVAR-CONCORD Environmental

HCl METHOD 26 SAMPLING TRAIN
RECOVERY DATA FORM

PROJECT NO.: 5916265

LOCATION: STACK B TEST #: T6-HCl/B DATE: 95.11.19

Impingers 1 and 2	Impingers 3 and 4
Weigh impingers Empty contents into container and rinse with DI water	Weigh impingers Empty contents into container and rinse with DI water

Container TS1 Impingers 1 and 2 0.1 N H2SO4 Contents and DI Water Rinses	
Final Wt.:	133.2
Initial Wt.:	33.2
Gain:	100.0

Container TS2 Impingers 3 and 4 0.1 N NaOH Contents and DI Water Rinses	
Final Wt.:	133.9
Initial Wt.:	33.4
Gain:	102.0

Mark Liquid Level ✓	Seal and Label ✓

Train Identification	
Train No.:	T6-HCL-B
0.1 N H2SO4 Batch No.:	Zenon
DI Water Batch No.:	Zenon
0.1 N NaOH Batch No.:	Zenon
Train Loaded By:	JA
Recovered By:	JA
Reagent Blank Submitted: Yes ✓	No _____

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	R160 & R140
Date:	95-11-19	Test:	26-HCl-B
Sample Location:	STACK B	Filter I.D.:	~~NA~~
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	BLANK	91.7	86.1	5.6 ✓
2	0.1N H_2SO_4	99.7	95.1	4.3 ✓
3	0.1N H_2SO_4	105.8	105.6	0.2 ✓
4	BLANK	71.0	70.9	0.1 ✓
5	0.1N NaOH	99.5	99.2	0.3 ✓
6	0.1N NaOH	97.1	96.9	0.2 ✓
7	S.G	129.6	128.6	1.0 ✓
8				
XAD Trap				
			Total (g)	11.7 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights	147.5	147.6	✓	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.19

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BOVAR-CONCORD Environmental

SYSTEM CALIBRATION AND DRIFT CALCULATIONS

CLIENT	RIGO+RIGO	DATE	NOV19/95
PROJECT NUMBER	5416265	TIME START	14:16
SAMPLE LOCATION	STACK	TIME FINISH	18:54
	TEST NUMBER	T5CEMB	

INSTRUMENT SPAN VALUES

OXYGEN	25	%	CARBON DIOXIDE	20	%
SULPHUR DIOXIDE	1000	PPM	CARBON MONOXIDE	1000	PPM
NITROGEN OXIDES	1000	PPM	TOTAL HYDROCARBO	100	PPM

ITEM	CAL.GAS VALUE	ANAL. CAL.	INITIAL VALUES SYSTEM CAL.	INITIAL VALUES SYSTEM CAL. BIAS (% SPAN)	FINAL VALUES SYSTEM CAL.	FINAL VALUES SYSTEM CAL. BIAS (% SPAN)	DRIFT (% SPAN)
O2 ZERO	0	0.1	0.1	0.0	0.1	0.0	0.0
O2 CAL	9.9	10.13	10.1	-0.1	10.1	-0.1	0.0
SO2 ZERO	0	0.36	0.3	-0.0	1	0.1	0.1
SO2 SPAN	149	144	142	-0.2	141	-0.3	-0.1
NOX ZERO	0	1.58	1.6	0.0	3.4	0.2	0.2
NOX SPAN	302	307	306	-0.1	308	0.1	0.2
CO2 ZERO	0	0.06	0.07	0.1	0.11	0.3	0.2
CO2 SPAN	7.01	7.03	7.03	0.0	7.07	0.2	0.2
CO ZERO	0	-1.5	-0.07	0.1	-0.14	0.1	-0.0
CO SPAN	100	99	99	0.0	99	0.0	0.0
THC ZERO	0	0.07	0.1	0.0	-1.3	-1.4	-1.4
THC SPAN	20.1	20	20.2	0.2	17.8	-2.2	-2.4

DRIFT CRITERIA <5% SPAN
BIAS CRITERIA <5% SPAN

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.19.95
RUN : T5-OC-B
LOC. : STACK B

RUN TIME : 14:54 TO 17:19

ORGANICS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
ORGANICS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	1.7278 DSm3	61.010 DScf
AVERAGE ISOKINETICITY	100.0 %	

FLUE GAS CHARACTERISTICS

MOISTURE	12.50 %	
TEMPERATURE	209.2 deg C	408.6 deg F
FLOW	46668 DSm3/hr	27468 DScfm
	101377 Am3/hr	59669 Acfm
VELOCITY	19.78 m/s	3894.6 fpm

GAS ANALYSIS	O2	10.90 %
	CO2	9.20 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.02 g/gmole D.B.
	MOL. WT.	28.52 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.19.95
RUN : T5-OC-B
LOC. : STACK B

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.4 kPa	25.50 in.Hg
STATIC PRESSURE	-141.9 Pa	-0.57 in.H2O
NOZZLE DIAMETER	5.79 mm	0.2280 in.
PITOT COEFFICIENT	0.796	
METER CORRECTION FACTOR	0.983	

CONDENSATE COLLECTION

RESIN TRAP CONDENSATE	0.4 g
CONDENSATION IN IMPINGER 1	145.3 g
CONDENSATION IN IMPINGER 2	17.3 g
CONDENSATION IN IMPINGER 3	3.0 g
CONDENSATION IN IMPINGER 4	0.8 g
SILICA GEL WEIGHT GAIN	14.7 g
TOTAL MOISTURE GAIN	181.5 g

ORGANICS COLLECTION

FILTER ORGANICS	0.0000 mg
WASHINGS ORGANICS	0.0000 mg
RESIN ORGANICS	0.0000 mg
IMPINGER ORGANICS	0.0000 mg
TOTAL ORGANICS	0.0000 mg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.19.95
RUN : T5-OC-B
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1													
1	0.0	397	0.500	0.70	45.20	78	244	246	56	57	3.0	1.0	100.6
1	3.0	401	0.500	0.70	46.69	78	245	248	56	50	4.0	1.0	102.1
2	6.0	402	0.600	0.75	48.20	78	244	247	56	49	4.0	2.0	100.0
2	9.0	405	0.670	0.85	49.82	79	247	247	57	49	5.0	2.0	98.8
3	12.0	406	0.640	0.80	51.51	79	247	247	57	49	4.0	3.0	99.9
3	15.0	410	0.640	0.85	53.18	80	245	247	56	51	5.0	3.0	100.0
4	18.0	411	0.600	0.85	54.85	81	247	248	56	52	5.0	4.0	102.0
4	21.0	408	0.500	0.70	56.50	81	246	248	56	52	4.0	4.0	102.7
5	24.0	407	0.500	0.70	58.02	80	247	245	56	51	4.0	5.0	101.4
5	27.0	409	0.550	0.75	59.52	80	246	245	57	51	5.0	5.0	103.3
6	30.0	409	0.800	1.00	61.12	80	246	243	56	51	5.0	6.0	99.6
6	33.0	410	0.880	1.20	62.98	81	247	245	56	51	6.0	6.0	100.0
7	36.0	410	0.840	1.40	64.94	81	246	245	55	50	6.0	7.0	102.5
7	39.0	410	1.100	1.60	66.90	81	246	245	55	50	7.0	7.0	101.5
8	42.0	415	1.100	1.60	69.12	81	247	248	55	50	7.0	8.0	100.8
8	45.0	409	1.100	1.60	71.32	81	248	250	55	50	7.0	8.0	100.4
9	48.0	392	0.700	1.00	73.52	81	248	246	56	51	5.0	9.0	99.0
9	51.0	386	0.550	0.75	75.27	81	246	247	56	51	4.0	9.0	98.5
10	54.0	375	0.500	0.70	76.82	81	246	245	58	51	4.0	10.0	99.9
10	57.0	350	0.500	0.70	78.33	81	245	245	59	51	4.0	10.0	99.7
	60.0				79.86								
TRAVERSE NO. 2													
1	0.0	420	0.800	1.10	80.37	78	245	251	56	55	4.0	1.0	100.7
1	3.0	423	0.960	1.30	82.23	79	246	248	54	46	6.0	1.0	100.7
2	6.0	421	0.760	1.00	84.27	80	246	247	51	45	5.0	2.0	100.1
2	9.0	420	0.800	1.10	86.08	81	246	247	44	45	5.0	2.0	101.7
3	12.0	418	0.870	1.20	87.97	81	247	247	42	44	5.0	3.0	100.0
3	15.0	420	1.100	1.50	89.91	82	247	248	41	44	6.0	3.0	99.9
4	18.0	423	1.100	1.50	92.09	83	247	248	41	44	6.0	4.0	100.0
4	21.0	423	0.900	1.30	94.27	83	249	248	41	44	6.0	4.0	100.3
5	24.0	419	0.920	1.30	96.25	83	248	247	41	45	6.0	5.0	98.5
5	27.0	421	1.100	1.50	98.22	83	249	248	41	45	6.0	5.0	98.0
6	30.0	423	1.100	1.50	100.36	84	250	248	42	46	6.0	6.0	99.7
6	33.0	422	0.940	1.30	102.54	84	248	249	42	46	6.0	6.0	100.3
7	36.0	419	0.760	1.00	104.57	84	249	248	41	46	5.0	7.0	98.7

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.19.95
RUN : T5-OC-B
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	415	0.820	1.10	106.37	85	248	248	42	47	5.0	7.0	100.5
8	42.0	416	0.800	1.00	108.28	85	248	248	42	47	5.0	8.0	98.6
8	45.0	415	0.800	1.00	110.13	85	249	249	42	47	5.0	8.0	96.9
9	48.0	415	0.800	1.10	111.95	85	248	248	42	47	5.0	9.0	99.0
9	51.0	415	0.740	1.00	113.81	85	248	249	42	47	5.0	9.0	99.6
10	54.0	392	0.600	0.80	115.61	85	249	248	42	47	4.0	10.0	100.0
10	57.0	380	0.600	0.80	117.26	85	247	249	42	47	4.0	10.0	98.7
	60.0				118.90								
		409	0.763	1.06		81	247	247	50	49	5.1		100.0

ISOKINETIC TEST DATA FORM

Sample Type: Organics Reference Method: EPA M23 Page 1 of 5

Client:	Rigo + Rigo	City, Province:	Layton, UTAH
Project Number:	5416265	Test Number:	T5-OCB
Sample Location:	B Stack	Date:	Nov 19/95
Start Time:	2:54 pm	Finish Time:	5:19
Barometric Press. (in Hg):	25.5	Stack Press(in H_2O): + or -:	-0.57
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes (No)

Sample Box Number:	T1	Gas Meter Factor:	0.983	Calibration Date:	Sept 19/95
Nozzle I.D.:	T1-2	Nozzle Diameter (in.):	0.228	Calibration Date:	Nov 16/95
Probe I.D.:	T2-7	Pitot Coefficient:	0.796	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): 9.2 O_2 (%): 10.9 CO (ppm): _____ Other: _____

Impinger 1 (g)	195.3	Assumed H_2O (%):	14
Impinger 2 (g)	17.3	Filter I.D. #:	—
Impinger 3 (g)	3.0	Net Filter Wt. (g):	—
Impinger 4 (g)	0.0	Net Probe Wash Wt. (g):	—
Impinger 5 (g) S.G.	14.7	Imp. Residue Wt. (g):	—
~~Impinger 6 (g)~~ Coil	0.0		
XAD-2 Trap (g)	0.4		
Total H_2O Condensed (g)	181.5		

Sampling Comments: Train 01 (reused after T3-OCB)
Trap 11

Process Rate: _____

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: Nov 19/95

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	Rigo 1 Rigo
Date:	Nov 19/95	Test:	T5-OCB
Sample Location:	B Stack	Filter I.D.:	—
Pre Weights by:	HVB	Post Weights by:	HVB

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	MT	570.5	425.2	145.3 ✓
2	RoDI	636.6	619.3	17.3 ✓
3	RoDI	620.8	617.8	3.0 ✓
4	MT	472.6	472.0	0.6 ✓
5	S.G.	800.2	785.5	14.7 ✓
~~6~~				
~~7~~				
~~8~~ Coil	(condenser only)	290.1	290.1	0.0 ✓
XAD Trap	(no foil, trap only)	338.2	337.8	0.4 ✓
			Total (g)	181.5

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: Train 01 (reused after T3-OCB)
Trap 11

Signature: [signature]

Date: Nov 19/95

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BOVAR-CONCORD Environmental

DATE: 9/11/95 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: HOB

Run #: TS-UCB Traverse #: 1 Traverse Direction: North Start Time: 2:54 p.m. Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		0.50	0.7	.499	45.20	397	244	246	57	56	79	77	3
	3		0.50	0.7	.499	46.69	401	245	248	50	56	79	77	4
2	6		0.60	0.75	.547	48.20	402	244	247	49	56	79	77	4
	9		0.67	0.85	.578	49.82	405	247	247	49	57	81	77	5
3	12		0.64	0.8	.565	51.51	406	247	247	49	57	81	77	4
	15		0.64	0.85	.565	53.18	410	245	247	51	56	82	79	5
4	18		0.60	0.85	.547	54.85	411	247	248	52	56	83	78	5
	21		0.50	0.7	.499	56.50	408	246	248	52	56	83	78	4
5	24		0.50	0.7	.499	58.02	407	247	245	51	56	82	77	4
	27		0.55	0.75	.524	59.52	409	246	247	51	57	82	77	5
6	30		0.80	1.0	.631	61.12	409	246	243	51	56	82	77	5
	33		0.88	1.2	.662	62.98	410	247	245	51	56	83	78	6

Pre test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 44.90 Leak Volume End: 45.20

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 9/11/95 SAMPLING TRAINS DATA SHEET PAGE 3 OF 3

Client: Riger Rigo Project #: 5416265 Sample Location: B Stack Operators: HUB

Run #: TS-OCB Traverse #: 1 Traverse Direction: North Start Time: _____ Finish Time: 3:54 pm

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.84	1.4	.647	64.94	410	246	245	50	55	83	78	6
	39		1.1	1.6	.740	66.90	410	246	245	50	55	83	78	7
8	42		1.1	1.6	.740	69.12	415	247	248	50	55	84	78	7
	45		1.1	1.6	.740	71.32	409	248	250	50	55	84	78	7
9	48		0.7	1.0	.590	73.52	392	246	246	51	56	84	78	5
	51		0.55	0.75	.524	75.27	386	246	247	51	56	84	78	4
10	54		0.50	0.70	.506	76.82	375	246	245	51	58	84	78	4
	57		0.50	0.7	.514	78.33	350	245	245	51	59	84	78	4
	60					79.86								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.000 at 16 inches Hg (Vacuum) Leak Volume Start: 79.86 Leak Volume End: 80.14

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 9/16/95 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: Rigo & Rigo Project #: 5416265 Sample Location: B Stack Operators: HUB

Run #: TS-OCB Traverse #: 2 Traverse Direction: East Start Time: 4:19 Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		0.80	1.1	.622	80.37	420	245	251	55	56	78	77	4
	3		0.96	1.3	.682	82.23	423	246	248	46	54	81	77	6
2	6		0.76	1.0	.607	84.27	421	246	247	45	51	82	78	5
	9		0.80	1.1	.622	86.08	420	246	247	45	44	83	78	5
3	12		0.87	1.2	.649	87.97	418	247	247	44	42	84	78	5
	15		1.1	1.5	.730	89.91	420	247	248	44	41	85	79	6
4	18		1.1	1.5	.730	92.09	423	247	248	44	41	86	79	6
	21		0.90	1.3	.660	94.27	423	249	248	44	41	86	79	6
5	24		0.92	1.3	.667	96.25	419	248	247	45	41	86	79	6
	27		1.1	1.5	.730	98.22	421	249	248	45	41	86	80	6
6	30		1.1	1.5	.730	100.36	423	250	248	46	42	88	80	6
	33		0.94	1.3	.675	102.54	422	248	249	46	42	88	80	6

Pre test leak check: Rate (cfm) 0.006 at 15 inches Hg (Vacuum) Leak Volume Start: 80.14 Leak Volume End: 80.37

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

DATE: 9/11/95 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: HUB

Run #: TS-OCB Traverse #: 2 Traverse Direction: East Start Time: _____ Finish Time: 5:19

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	36		0.76	1.0	.607	104.57	419	249	248	46	41	88	80	5
	39		0.82	1.1	.630	106.37	415	248	248	47	42	88	81	5
8	42		0.80	1.0	.622	108.28	416	248	248	47	42	88	81	5
	45		0.80	1.0	.622	110.13	415	249	249	47	42	88	81	5
9	48		0.80	1.1	.622	111.95	415	248	248	47	42	88	82	5
	51		0.74	1.0	.599	113.81	415	248	249	47	42	88	82	5
10	54		0.80	0.8	.547	115.61	392	249	248	47	42	88	82	4
	57		0.60	0.8	.547	117.26	380	247	249	47	42	88	82	4
	60					118.90								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.006 at 15 inches Hg (Vacuum) Leak Volume Start: 118.90 Leak Volume End: 119.17

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: Nov 19/95 TEST TS-OCB

Client: Rigo + Rigo Location: B Stack Operator: HUB

Sample Type: Organics Reference Method: EPA M23

Modifications: using Environment Canada recovery procedure train rinse with acetone/DCM + proving rinse with toluene.

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	.26 " H_2O
Static positive or negative	⟷	-ve
Average Temperature	⟷	400°F
Estimate % H_2O	⟷	14%
How estimated?	⟷	TI-OCA results
Estimate Gas Composition	⟷	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	⟷	TI-CEMA results
Proper nozzle selected?	✓	
K factor	⟷	.706 at 400°F
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other	✓	Watch
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	Proving rinse following TI-OCA
Round ? Undamaged?		
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	Proving rinse following TI-OCA
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5116265 DATE: Nov 19/95 TEST T5-OCB

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	⟷	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type	K	
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	Pleuing rinse of Train 01 following T3-OCB
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	Pleuing rinse of Train 01 after T3-OCB
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

QA/QC CHECKLIST

PROJECT # 5416265 DATE: Nov 19/95 TEST T5-OCB

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	Previous rinse of Train after T3-OCB
IMPINGERS		
No. of Impingers	---	5
Contents #1	---	MT
#2	---	RoDI
#3	---	RoDI
#4	---	MT
#5	---	S.G.
~~#6~~	---	
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	---	
Grease used on joints	X	
Silica gel type	---	
New?		
Used?	✓	
Pre Test Leak Check		
Performed	✓	
Rate	---	0.01 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	---	20% Spent
Leak checks at port changes Before	---	0.008 cfm@ 16 "Hg
After	---	0.006 cfm@ 15 "Hg
Final leak race acceptable	---	0.006 cfm@ 15 "Hg
General comments on sampling technique	---	
Sample recovery performed on-site?	✓	
Sample recovery performed by	---	
Clean-up area - General Environment	---	Clean
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: Nov 19/95 TEST TS-OCB

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	⟷	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass		cleaned foil in plastic bag
plastic		
Balance Type	⟷	top loader
Calibrated or QC checked	⟷	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently		
Probe and sample train openings covered		
Silica Gel		
Condition/Colour	✓	50% spent
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		Good
Colour of Filter		Grey
Foil Wrapped?	✓	
Probe Rinses		
Acetone	✓	
Other Ethanol	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

#5

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: B- STACK TEST #: TS - OC-3 DATE: Nov. 19 | 95 PROJECT NO.: 541 - 6265

Nozzle, Probe Liner Front Half Filter Holder, All aqueous	Filter	Back Half Filter Holder and Condenser Coil	XAD Resin	Impingers & ~~HPLC~~ Rinse RODI	Back Half Rinse
Wash and brush 3x each with hexane and acetone. Rinse 3x with with hexane and and acetone.	Remove and place on pre-cleaned foil fold in half and place in ~~petri dish~~. Ziploc bag	**Weigh Coil & Record Weight** ~~Soak 5 minutes each with hexane and acetone. Rinse 3x with hexane and acetone.~~ TOLUENE PURGE	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into #4 container. ~~Rinse 3x with HPLC water~~	Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone.

Container ~~TS1~~ TS2 ~~Front Half~~ Acetone ~~Hexane~~ Rinse DCM	
Final Wt:	564.9
Initial Wt:	264.5
Gain:	296.4

Container ~~TS3~~ TS1 Filter	
Filter ID:	TS-OC B
Colour:	Grey

Container TS3 Back Half Filter and Condenser Coil	
Final Wt:	497.8
Initial Wt:	265.1
Gain:	232.7
Colour:	Clear

Container TS4 XAD Resin	
Wrap in Foil	
XAD:	046627
Colour:	White

Trap 11

Container TS5 Impinger Contents	
Final Wt:	687.5
Initial Wt:	266.5
Gain:	421.0
Colour:	Clear

Container TS6 Back Half Rinse	
Final Wt:	
Initial Wt:	
Gain:	
Colour:	

Mark Fluid Levels
Seal and Label

~~Train~~ & Proofing Identification	
Train No.:	04 NB
RODI ~~HPLC~~ Batch No.:	ZENON 95|10|26
Acetone ~~Batch~~ No.:	CALEDON 14123
DCM ~~Hexane~~ Batch No.:	CALEDON 16700
Filter Batch No.:	ZENON 95|10|26 XAD No.: Trap 11
Train Assembled By:	HVB
Train Recovered By:	RR

Reagent Blanks Collected?	Yes
Combined Acetone/~~Hexane~~	DCM
~~Combined Glycol~~/Water	
Blank Train Collected?	Yes
Comments:	

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BOVAR-CONCORD Environmental

ISOKINETIC TEST DATA FORM

Sample Type: Organics (Blank) Reference Method: EPA M23 Page 1 of 2

Client:	Rust + Rigo	City, Province:	Layton, UTAH
Project Number:	54162 65	Test Number:	Bi - OC
Sample Location:	B Stack	Date:	Nov 19/95
Start Time:	12:44	Finish Time:	18:50
Barometric Press. (in Hg):	25.8	Stack Press(in H_2O): + or -:	-.50
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes No

Sample Box Number:	T1	Gas Meter Factor:	0.983	Calibration Date:	Sept 17/95
Nozzle I.D.:	T1-2	Nozzle Diameter (in.):	0.228	Calibration Date:	Nov 16/95
Probe I.D.:	T2-7	Pitot Coefficient:	0.796	Calibration Date:	Sept/95

Equipment Comments: Blank Organics Train #1

STACK GAS COMPOSITION

CO_2 (%): _____ 0_2 (%): _____ CO (ppm): _____ Other: _____

Impinger 1 (g)	-0.1	Assumed H_2O (%):	—
Impinger 2 (g)	-0.7	Filter I.D. #:	—
Impinger 3 (g)	-1.0	Net Filter Wt. (g):	—
Impinger 4 (g)	-0.2	Net Probe Wash Wt. (g):	—
Impinger 5 (g) S.G	1.2	Imp. Residue Wt. (g):	—
~~Impinger 6 (g)~~ Condenser	0.0		
XAD-2 Trap (g)	0.0		
Total H_2O Condensed (g)	-0.0		

Sampling Comments: Train 02 (reused after T4-OCA) Trap 15

~~Process Rate~~: Ambient air drawn through blank train, volume equal to largest leak check volume of T1-OCA

Control Equipment Operation: ~~T2-OCA, T3-OCB, T4-OCA and T5-OCB~~ 3.1 ft³

Process Comments: _____

Signature: _____ Date: Nov 19/95

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	Rago + Rago
Date:	Nov 19/95	Test:	Bi-OC
Sample Location:	B Stack	Filter I.D.:	—
Pre Weights by:	HVB	Post Weights by:	HVB

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Empty	430.1	430.2	-0.1
2	RoDI	575.3	576.0	-0.7
3	RoDI	602.7	603.7	-1.0
4	Empty	472.5	472.7	-0.2
5	Silica Gel	804.2	803.0	1.2
6				
7				
~~8~~ Condenser		233.6	233.6	0.0
XAD Trap		334.5	334.5	0.0
			Total (g)	-0.8

Moisture based on Toluene in impingers only

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: Train 02 (reused after TY-OCA)
Trap 15

Signature: [signature]

Date: Nov 19/95

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BOVAR-CONCORD Environmental

DATE: 9/11/95 SAMPLING TRAINS DATA SHEET PAGE 2 OF 3

Client: Riggs + Riggs Project #: 5416265 Sample Location: B Stack Operators: HUB JSW

Run #: B1-OC Traverse #: NA Traverse Direction: NA Start Time: 18:44 Finish Time: 18:50

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
	0					119.169						81	81	5
	6					122.269						81	81	5

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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Blank Organics Train #1

BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: Nov 19/95 TEST B1-OC

Client: Rise + Rise Location: B Stack Operator: WVB/JW

Sample Type: Organics Blank Reference Method: EPA M23

Modifications: Recovered using Fnx - Can., acetone/DCM followed by toluene probe rinse. → ambient air (3.1 ft³) drawn through probe + train set up at the stack).

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	X	
Avg. ΔP	⟷	NA
Static positive or negative	⟷	NA
Average Temperature	⟷	NA
Estimate % H_2O	⟷	NA
How estimated?	⟷	NA
Estimate Gas Composition	⟷	O_2% ___ CO_2(%) ___ CO(ppm) ___
How Estimated?	⟷	NA
Proper nozzle selected?	✓	Same as T1-TS0C
K factor	⟷	—
Number of sampling points per traverse	⟷	—
Probe markings correct?		—
Time per point	⟷	—
Number of readings per point	⟷	—
Barometric Pressure Measured?		—
Mercury		
Aneroid		
Other		
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	Probing rinse after TS-OCB
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	Probing rinse after TS-OCB
PROBE HEATING SYSTEM:		
Checked		NA
Temperature 250 ± 25°F		NA
Stable		NA

PROJECT # 5416265 DATE: Nov 19/95 TEST B1-OC

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	-	NA
Other		
Properly attached to probe (no interference with nozzle)		—
Modifications	⟷	
Connected to:		—
inclined manometer		
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak		NA
Pitot pressure gauge zeroed		—
Orifice pressure gauge zeroed		—
Meter box levelled		—
Gas Temperature Sensor		—
Thermocouple		—
Type		—
Temp. checked against ambient temp		—
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	Rinsing of Train 02 after T4-OCA
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	X	
Temperature (250 ± 25°F)		NA
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	Rinsing of Train 02 after T4-OCA
Thermocouple attached to trap	X	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 5416265 DATE: Nov 19/95 TEST B1-OC

ITEM	✓	COMMENTS
GLASSWARE		Previous rinse of Train 02 after T4-OCA
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	MT
#2	⟷	RODI
#3	⟷	RODI
#4	⟷	MT
#5	⟷	S.G
~~#6~~	⟷	
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly		NA (not used)
Modifications	⟷	
Grease used on joints	X	
Silica gel type	⟷	
New?		
Used?	✓	
Pre Test Leak Check		
Performed	X	
Rate	⟷	cfm@ "Hg
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	X	not in stack
Is care taken to avoid scraping nipple or stackwall		NA
Effective seal around probe when in-stack		"
Probe moved to traverse point at right time		"
Nozzle and pitot tube kept parallel to stack at all times		"
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F		NA
Probe temperature 250 ± 25°F		"
Filter box temperature 250 ± 25°F		"
Data forms completed and data recorded properly	✓	
Ice level checked		NA
Condition of silica gel	⟷	50 % spent
Leak checks at port changes Before	⟷	NA cfm@ "Hg
After	⟷	NA cfm@ "Hg
Final leak race acceptable	⟷	NA cfm@ "Hg
General comments on sampling technique	⟷	ambient air drawn through train
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	RB / JA
Clean-up area - General Environment	⟷	Clean
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

#6

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: B - Stack TEST #: B1 - OC DATE: Nov 19/95 PROJECT NO.: 541 - 6263

Nozzle, Probe Liner Front Half Filter Holder All equipment	Filter	Back Half Filter Holder and Condenser Coil All equipment	XAD Resin	Impingers & ~~HPLC~~ Rinse RODZ	Back Half Rinse
Wash and brush 3x each with hexane and acetone. Rinse 3x with with ~~hexane~~ and and acetone. DCM	Remove and place on pre-cleaned foil fold in half and place in ~~petri dish~~. Zip loc bag	**Weigh Coil & Record Weight** ~~Soak 5 minutes each with hexane and acetone. Rinse 3x with~~ hexane ~~and acetone.~~ TOLUENE Pewy	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into container. ~~Rinse 3x with HPLC water.~~	Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone.

Container ~~TS1~~ TS2 Front Half Acetone Hexane Rinse	
Final Wt:	458.3
Initial Wt:	262.2
Gain:	

Container ~~TS2~~ TS1 Filter	
Filter ID:	
Colour:	Clear White

Container TS3 Back Half Filter and Condenser Coil	
Final Wt:	472.1
Initial Wt:	262.5
Gain:	
Colour:	Clear

Container TS4 XAD Resin	

Wrap in Foil	
XAD:	046631
Colour:	White

TRAP 15

Container TS5 Impinger Contents	
Final Wt:	494.2
Initial Wt.:	262.6
Gain:	
Colour:	

Container TS6 Back Half Rinse	
Final Wt.:	
Initial Wt.:	
Gain:	
Colour:	

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	02
RODZ ~~HPLC~~ Batch No.:	ZENON 95/10/26
Acetone Batch No.:	CALEDON 14123
Hexane Batch No.:	CALEDON 16700
Filter Batch No.:	ZENON 95/10/26 XAD No.: TRAP 15
Train Assembled By:	HVD
Train Recovered By:	RF

Reagent Blanks Collected?	
Combined Acetone/~~Hexane~~	DCM
~~Combined Glycol~~/Water	
Blank Train Collected?	Yes.
Comments:	

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: Nov 19/95 TEST B1-OC

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	⟷	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass		cleaned foil + plastic bag
plastic		
Balance Type	⟷	top loader
Calibrated or QC checked	⟷	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently		
Probe and sample train openings covered		
Silica Gel		
Condition/Colour	✓	50 % spent
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		Good
Colour of Filter		white
Foil Wrapped?		
Probe Rinses		
Acetone	✓	
Other 15% min.	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 19
RUN : T5-MP-B
LOC. : B STACK

RUN TIME : 16:37 TO 18:52

METALS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
METALS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	2.1660 DSm3	76.484 DScf
AVERAGE ISOKINETICITY	104.1 %	

FLUE GAS CHARACTERISTICS

MOISTURE	12.56 %	
TEMPERATURE	212.0 deg C	413.6 deg F
FLOW	49075 DSm3/hr	28885 DScfm
	107305 Am3/hr	63158 Acfm
VELOCITY	20.94 m/s	4122.4 fpm

GAS ANALYSIS	O2	10.90 %
	CO2	9.20 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.02 g/gmole D.B.
	MOL. WT.	28.51 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 19
RUN : T5-MP-B
LOC. : B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.4 kPa	25.50 in.Hg
STATIC PRESSURE	-141.9 Pa	-0.57 in.H2O
NOZZLE DIAMETER	6.20 mm	0.2440 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	75.6 g
CONDENSATION IN IMPINGER 2	91.4 g
CONDENSATION IN IMPINGER 3	35.1 g
CONDENSATION IN IMPINGER 4	9.2 g
CONDENSATION IN IMPINGER 5	3.1 g
CONDENSATION IN IMPINGER 6	0.7 g
SILICA GEL WEIGHT GAIN	13.8 g
TOTAL MOISTURE GAIN	228.9 g

METALS COLLECTION

FILTER METALS	0.0000 mg
WASHINGS METALS	0.0000 mg
IMPINGER METALS	0.0000 mg
TOTAL METALS	0.0000 mg

TOTAL SAMPLING TIME 120.0 min.

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 19
RUN : T5-MP-B
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	401	0.760	1.40	186.81	75	247	256	45	1.0	1.0	102.0
1	3.0	402	0.760	1.55	188.88	78	249	254	41	1.0	1.0	104.5
2	6.0	401	0.710	1.40	191.01	79	250	257	39	1.0	2.0	100.7
2	9.0	402	0.850	1.80	193.00	80	250	254	39	1.0	2.0	106.0
3	12.0	412	0.930	2.00	195.29	81	250	254	39	1.0	3.0	105.3
3	15.0	411	0.780	1.55	197.66	81	250	256	40	1.0	3.0	104.0
4	18.0	413	0.880	1.90	199.81	82	250	256	40	1.0	4.0	104.8
4	21.0	419	0.910	1.95	202.11	82	250	254	41	1.0	4.0	107.5
5	24.0	419	0.970	2.25	204.50	83	250	252	3	1.0	5.0	108.8
5	27.0	417	0.910	1.95	207.00	83	251	254	42	1.0	5.0	106.7
6	30.0	419	0.720	1.40	209.38	84	251	255	42	1.0	6.0	103.2
6	33.0	415	0.650	1.30	211.43	84	250	258	42	1.0	6.0	104.1
7	36.0	416	0.710	1.40	213.40	84	251	256	42	1.0	7.0	101.7
7	39.0	418	0.770	1.40	215.41	84	251	253	42	1.0	7.0	97.2
8	42.0	418	0.750	1.40	217.41	85	252	257	42	1.0	8.0	97.4
8	45.0	418	0.730	1.35	219.39	85	252	259	41	1.0	8.0	99.7
9	48.0	416	0.730	1.35	221.39	85	252	257	43	1.0	9.0	101.1
9	51.0	417	0.780	1.45	223.42	85	251	257	43	1.0	9.0	104.1
10	54.0	413	0.580	1.10	225.58	85	250	255	43	1.0	10.0	103.0
10	57.0	410	0.510	1.00	227.43	85	250	258	43	1.0	10.0	103.1
	60.0				229.17							
TRAVERSE NO. 2												
1	0.0	417	0.920	2.00	229.87	84	249	256	42	1.0	1.0	105.2
1	3.0	419	0.900	1.90	232.23	85	250	258	41	1.0	1.0	106.7
2	6.0	421	0.970	2.20	234.60	85	252	259	42	1.0	2.0	108.2
2	9.0	421	0.900	1.90	237.09	85	252	258	43	1.0	2.0	108.0
3	12.0	421	0.960	2.10	239.49	86	252	256	43	1.0	3.0	105.4
3	15.0	422	1.000	2.20	241.91	86	252	258	44	1.0	3.0	104.3
4	18.0	423	1.200	2.30	244.35	86	252	255	45	1.0	4.0	101.4
4	21.0	421	1.200	2.40	246.95	86	253	257	45	1.0	4.0	104.4
5	24.0	422	1.200	2.40	249.63	86	253	257	46	1.0	5.0	104.9
5	27.0	414	0.850	1.80	252.32	86	252	256	46	1.0	5.0	105.4
6	30.0	414	0.900	1.90	254.61	86	252	257	46	1.0	6.0	105.2
6	33.0	413	0.900	1.90	256.96	86	252	256	46	1.0	6.0	105.1
7	36.0	410	0.900	1.90	259.31	86	252	257	45	1.0	7.0	106.3

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 19
RUN : T5-MP-B
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	410	0.980	2.05	261.69	86	252	258	45	1.0	7.0	106.6
8	42.0	411	0.960	1.95	264.18	86	251	255	46	1.0	8.0	102.1
8	45.0	408	0.720	1.40	266.54	86	251	257	45	1.0	8.0	103.1
9	48.0	409	0.830	1.75	268.61	86	251	256	45	1.0	9.0	104.1
9	51.0	408	0.880	1.80	270.85	86	251	259	45	1.0	9.0	102.4
10	54.0	401	0.710	1.40	273.12	86	251	256	46	1.0	10.0	104.4
10	57.0	401	0.810	1.70	275.21	86	251	257	45	1.0	10.0	103.4
	60.0				277.42							
		414	0.846	1.75		84	251	256	42	1.0		104.1

ISOKINETIC TEST DATA FORM

Sample Type: M5 Reference Method: M29 EPA Page 1 of 5

Client:	Cargill	City, Province:	Layton, Utah
Project Number:	5411226	Test Number:	TS-MF-B
Sample Location:	B Stack	Date:	95/11/9
Start Time:	16:37	Finish Time:	18:52
Barometric Press. (in Hg):	25.5	Stack Press(in H_2O): + or -:	-.52
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes No

Sample Box Number:	T3	Gas Meter Factor:	1.006	Calibration Date:	Sept/95
Nozzle I.D.:	B2	Nozzle Diameter (in.):	.249	Calibration Date:	Nov/95
Probe I.D.:	T1-7'	Pitot Coefficient:	.799 #3	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): _____ 0_2 (%): _____ CO (ppm): _____ Other: _____

Impinger 1 (g)	75.4	Assumed H_2O (%):	14
Impinger 2 (g)	91.4	Filter I.D. #:	
Impinger 3 (g)	35.1	Net Filter Wt. (g):	
Impinger 4 (g)	9.2	Net Probe Wash Wt. (g):	
Impinger 5 (g)	3.1	Imp. Residue Wt. (g):	
Impinger 6 (g)	0.7		
~~XAD-2 Trap~~ (g) S.G.	13.8		
Total H_2O Condensed (g)	228.9		

Sampling Comments: _____

Process Rate: _____

Control Equipment Operation: ESP

Process Comments: Normal Temp high load with AC

Signature: _____ Date: 95/11/9

MOISTURE ANALYSIS DATA SHEET

Project #:	5716265	Client:	Riley & Riley
Date:	95.11.19	Test:	TS-MP-8
Sample Location:	STACK B	Filter I.D.:	5111 A
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	544.4	4688	75.6
2	5% HNO_3 & 10% H_2O_2	676.6	585.2	91.4
3	5% HNO_3 & 10% H_2O_2	694.2	659.1	35.1
4	Blank	502.2	493.0	9.2
5	$KMnO_4$	585.7	582.6	3.1
6	$KMnO_4$	600.2	599.5	0.7
7	Silica Gel	794.3	780.5	13.8
8				
~~XAD Trap~~				
			Total (g)	228.9

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	147.5	147.6	—	JA
Post weights	147.5	147.4	—	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.19

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BOVAR-CONCORD Environmental

DATE: 95 / 11 / 19

SAMPLING TRAINS DATA SHEET

Client: Kupe + Rizo Project #: 5911621.01 Sample Location: B Stack Operators: SD/JT

Run #: T5-MP-B Traverse #: 1 Traverse Direction: IN Start Time: 16:37 Finish Time: 17:37

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.76	1.4		186.809	401	247	256	45	NA	76	74	1.0
1	3		0.76	1.55	188.952	188.88	402	249	254	41		81	75	1.0
2	6		0.71	1.4	*191.023	191.01	401	250	257	39		82	76	1.0
2	9		0.85	1.8	193.082	193.00	402	250	254	39		83	76	1.0
3	12		0.93	2.0	*195.207	195.29	412	250	259	39		84	77	1.0
3	15		0.78	1.55	197.601	197.66	411	250	256	40		84	78	1.0
4	18		0.88	1.9	*199.831	199.81	413	250	256	40		85	79	1.0
4	21		.91	1.95	202.116	202.11	419	250	254	41		85	79	1.0
5	24		.97	2.25	*204.455	204.50	419	250	252	41		86	80	1.0
5	27		0.91	1.95	206.922	207.00	417	251	254	42		86	80	1.0
6	30		0.72	1.4	*209345	209.38	419	251	255	42		86	81	1.0
6	33		0.65	1.3	211.466	211.43	415	250	258	42		86	81	1.0
7	36		0.71	1.4	*212.412	213.40	416	251	256	42		86	81	1.0

Pre test leak check: Rate (cfm) .009 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .007 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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Static = 1.57

BOVAR-CONCORD Environmenta

DATE: 25/11/14 SAMPLING TRAINS DATA SHEET PAGE 3 OF 5

Client: Kings Hwy Project #: 54116265 Sample Location: B Stack Operators: JC/JM

Run #: TSMP-B Traverse #: 1 Traverse Direction: IN Start Time: 16:37 Finish Time: 17:37

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	39		0.77	1.4	215.472	215.41	410	251	253	42	NA	86	82	1.0
8	42		0.75	1.4	*217.472	217.41	418	252	257	42		87	82	1.0
8	45		0.73	1.35	219.392	219.39	418	252	259	41		87	82	1.0
9	48		0.73	1.35	*221.342	221.39	416	252	257	43		87	82	1.0
9	51		0.78	1.45	223.491	223.42	417	251	257	43		87	83	1.0
10	54		0.58	1.1	*225.591	225.58	413	250	257	43		87	83	1.0
10	57		.51	1.0	227.483	227.43	410	250	258	43		87	83	1.0
10	60				229.187	229.171								

Pre test leak check: Rate (cfm) .008 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .007 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmenta

DATE: 95 / 11 / 19

SAMPLING TRAINS DATA SHEET

Client: Rizo-Hego   Project #: 541626   Sample Location: B Stack   Operators: JW / JM

Run #: TS-MP-8   Traverse #: 2   Traverse Direction: OUT   Start Time: 17:52   Finish Time: 18:52

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.92	2.0		229.866	417	249	256	42	N/A	84	83	1.0
1	3		0.90	1.9	232.224	232.23	419	250	258	41		86	83	1.0
2	6		0.97	2.2	*234.563	234.60	421	252	259	42		86	83	1.0
2	9		0.90	1.9	237.02	237.09	421	252	258	43		87	83	1.0
3	12		0.96	2.1	*239.423	239.45	421	252	256	43		88	83	1.0
3	15		1.0	2.20	241.899	241.91	422	252	258	44		88	83	1.0
4	18		1.2	2.3	*244.369	244.35	423	252	255	45		88	84	1.0
4	21		1.2	2.4	247.045	246.95	421	253	257	45		88	84	1.0
5	24		1.2	2.4	*249.645	249.63	422	253	257	46		88	84	1.0
5	27		0.85	1.8	252325	252.32	414	252	256	46		88	84	1.0
6	30		0.90	1.9	*254.587	254.61	414	252	257	46		88	84	1.0
6	33		0.90	1.9	256.943	256.96	413	252	256	46		88	84	1.0
7	36		0.90	1.9	*259.293	259.31	410	252	257	45		88	84	1.0

Pre test leak check: Rate (cfm) .000 at 15 inches Hg (Vacuum)   Leak Volume Start: ______   Leak Volume End: ______

Post test leak check: Rate (cfm) .001 at 16 inches Hg (Vacuum)   Leak Volume Start: ______   Leak Volume End: ______

K value calculated by: ______   Checked by: ______   Operator Signature: [signature]

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BOVAR-CONCORD Environmental

DATE: 8/11/17 **SAMPLING TRAINS DATA SHEET**

Client: Ryo Hlizo Project #: 5416275 Sample Location: B Stack Operators: JW/JW

Run #: B-MP-B Traverse #: 2 Traverse Direction: [illegible] Start Time: 17:52 Finish Time: 18:52

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	39		0.98	2.05	261.643	261.69	410	252	258	45	null	88	84	1.0
8	42		0.96	1.95	*264.124	264.18	411	251	258	46	↑	88	84	1.0
8	45		0.72	1.4	266.584	266.54	408	251	257	45		88	84	1.0
9	48		0.83	1.75	*268.626	268.61	409	251	256	45		88	84	1.0
9	51		.88	1.8	270.85	270.85	408	251	259	45		88	84	1.0
10	54		0.71	1.4	*273.156	273.12	401	251	256	46		88	84	1.0
10	57		0.81	1.7	275.162	275.21	401	251	257	45		88	84	1.0
10	60				277.473	277.419								

Pre test leak check: Rate (cfm) .006 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .001 at 10 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: [signature]

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BOVAR-CONCORD Environmental

PROJECT # 5411265 DATE: 9/11/19 TEST T5-MF-B

Client: Rigo + Rigo Location: K Stack Operator: JLS

Sample Type: MS Reference Method: EPA M29

Modifications:

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	
Static positive or negative	⟷	neg.
Average Temperature	⟷	
Estimate % H_2O	⟷	14
How estimated?	⟷	MS
Estimate Gas Composition	⟷	O_2% 20 CO_2(%) 0 CO(ppm)
How Estimated?	⟷	
Proper nozzle selected?	✓	
K factor	⟷	
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other	✓	water barometric.
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or		
Quartz	✓	
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or		
Quartz or	✓	
Other		
Cleaned according to protocol		
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5416205 DATE: 95/11/17 TEST 15-MP-3

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	----	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre		
Quartz	✓	
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	✓	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol	NA	
Thermocouple attached to trap		
XAD-2 Trap covered with foil at all times		

PROJECT # 5416265 DATE: 9/11/19 TEST F5 MF-B

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	↔	7
Contents #1	↔	
#2	↔	
#3	↔	
#4	↔	
#5	↔	
#6	↔	
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	↔	
Grease used on joints	✓	
Silica gel type	↔	
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate	↔	.009 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	N/A	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	↔	Blue/Pink
Leak checks at port changes Before	↔	.007 cfm@ 15 "Hg
After	↔	.010 cfm@ 15 "Hg
Final leak race acceptable	↔	.001 cfm@ 10 "Hg
General comments on sampling technique	↔	
Sample recovery performed on-site?	✓	
Sample recovery performed by	↔	JA
Clean-up area - General Environment	↔ ✓	
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 5411265 DATE: 97 11 19 TEST TS-Mt/PB

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	↔	teflon
Leak free	✓	
Petri Dishes: borosilicate glass		
plastic	✓	
Balance Type	↔	digital toploader
Calibrated or QC checked	↔	Actual ________ (g) Measured ________ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		
Colour of Filter		
Foil Wrapped?		
Probe Rinses		
Acetone	✓	
Other		+ HNO_3
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents		
Solvents		
Resin		
Blank Train		
Samples labelled and stored properly		
Liquid levels marked		
Samples delivered to lab		

 BOVAR-CONCORD Environmental

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: STACK B TEST #: T5-MP-B 7403 DATE: 95.11.19 PROJECT NO.: 5716265

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	Container TS3 Front Half 0.1 N HNO3 Rinse Final Wt.: 471.3 Initial Wt.: 266.0 Gain: 205.3 Comments:	Brush loose particulate onto filter	Container TS4-1 Impinger 4 Contents Final Wt.: 690.8 Initial Wt.: 265.6 Gain: 425.2	Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse Final Wt.: 490.5 Initial Wt.: 261.8 Gain: 229.1 Colour: CLEAR	Rinse with 100 mL 0.1 N HNO3	Rinse 3x with 100 mL Acidified KMnO4	Place rinsing in Container 5C which contains 200 mL of water	
Container TS2 Front Half Acetone Rinse Final Wt.: 323.4 Initial Wt.: 262.2 Gain: 61.2 Comments:		Filter TS2 Seal petri dish with tape Colour: GREY-GREEN Filter #: 51114 A 10250			Container TSA Impinger 4 Contents Final Wt.: 388.7 Initial Wt.: 262.5 Gain: 126.2	Rinse with 100 mL water	Container 5C HCL Rinse Final Wt.: 499.2 Initial Wt.: 262.4 Gain: 236.8 Colour: CLEAR	

filters crumbling stuffy & sticky (probe wash)

Train Identification	Blanks	
Train No.:		
HNO3 / H2O2 Batch No.:	Container 9	200 mLs
DI Water Batch No.:	Container 8B	100 mLs
Acetone Batch No.:	Container 7	100 mLs
0.1 N HNO3 Batch No.:	Container 8A	300 mLs
Acidified KMnO4 Batch No.:	Container 10	100 mLs
8 N HCl / Batch No.: DI Water	Container 11	25 mL / 200 mL
Filter Number:	Container 12	* _____

Container 5B Impinger 5 & 6 KMnO4 Content and Rinses
Final Wt.: 715.9
Initial Wt.: 262.4
Gain: 453.5
Colour: PURPLE

Mark Liquid Level on Containers ✓
Seal and Label Containers
Reagent Blanks Submitted? Yes ____ No ____
Prepare Fresh Acidified KMnO4 Daily ____ ✓

M29REC.DRW-May 95

BOVAR-CONCORD Environmental

Bp = 25.41
Time ON : 8:45
OFF : 9:45

METHOD 26
HCl SAMPLING DATA FORM

HIGH TEMP CARBON ON

Company Name	DAVIS COUNTY	Plant Location	LAYTON UTAH	Source Name	STACK B
Test Date	NOV 19/95	Test Number	TS-HCl-A	Job Number	5416265
Sampling for	HCl	Meter Box	Y 1.001	B.P. mm/inHg	860 mm/Hg

ABSORBING SOL'N	15 ml 0.1 N H_2SO_4	15 ml 0.1 N H_2SO_4	15 ml 0.1 N NaOH	15 ml 0.1 N NaOH	Silica Gel	GAS	1	2	3	4
WEIGHTS	IMP 1	IMP 2	IMP 3	IMP 4	IMP 5	READINGS				
EMPTY						O2				
FILLED FINAL						C02				
FILLED INITIAL						CO				
DIFFERENCE						TIME				

OPERATOR	JM	Sample Rate (Lpm)	~2	H20 Condensed		
Lk.Chk, (Init.)	0 cc/min	Lk. Chk. (Final)	-/ cc/min	Probe Purged	(Yes)	No)

Sample Time	Clock Time	Volume m³ ✓ Desired	Actual	Vacuum in.Hg	Meter Temp. °C/(°F)	Probe Temp. °C/(°F)	Box Temp. °C/(°F)	Impinger Temp. °C/°F
0	0		295.25	1	54.5	289	295	
10	5		306.4	1	55.5	245	285	
20	10		315.85	1	58.5	295	254	
30	15		325.95	1	60	235	242	
40	20		335.95	1	64	290	235	
50	25		345.9	1	65	230	259	
60	30		355.9	1	68.5	298	264	
70	35		366.1	1	69.5	236	260	
80	40		376.1	1	70.5	259	249	
90	45		386.0	1	72	235	251	
100	50		396.1	1	74	303	237	
110	55		406.25	1	72.5	236	235	
120	60		416.25	1	75	305	240	
		TOT/AVG	121	1	66.1	265.8	254	

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4.272 ft³

TIME OFF : 9:45

BOVAR-CONCORD Environmental

HCl METHOD 26 SAMPLING TRAIN
RECOVERY DATA FORM

PROJECT NO.: 5416265

LOCATION: STACK B TEST #: TS-HCL-A DATE: 95-11-19

Impingers 1 and 2	Impingers 3 and 4
Weigh impingers Empty contents into container and rinse with DI water	Weigh impingers Empty contents into container and rinse with DI water

Container TS1 Impingers 1 and 2 0.1 N H2SO4 Contents and DI Water Rinses	
Final Wt.:	133.2
Initial Wt.:	33.2
Gain:	100.0

Container TS2 Impingers 3 and 4 0.1 N NaOH Contents and DI Water Rinses	
Final Wt.:	133.6
Initial Wt.:	33.0
Gain:	100.0

Mark Liquid Level	Seal and Label

Train Identification	
Train No.:	TS-HCL-A
0.1 N H2SO4 Batch No.:	Zero
DI Water Batch No.:	Zero
0.1 N NaOH Batch No.:	Zero
Train Loaded By:	J.A
Recovered By:	J.A
Reagent Blank Submitted: Yes ✓	No _____

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	Kiln & Rig 0
Date:	95.11.18	Test:	T5-HCl-A
Sample Location:	STACK B	Filter I.D.:	—
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	EMPTY	92.7	86.1	6.6 ✓
2	15 ml 0.1N H_2SO_4	99.7	95.7	4.0 ✓
3	15 ml 0.1N H_2SO_4	106.1	106.0	0.1 ✓
4	Blank	71.0	71.0	0 ✓
5	15 ml 0.1 NaOH	99.5	99.5	0 ✓
6	15 ml 0.1 NaOH	97.1	97.0	0.1 ✓
7	Silicabel	128.6	127.9	0.7 ✓
8				
XAD Trap				
			Total (g)	11.5 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights	147.5	147.6	✓	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.18

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BOVAR-CONCORD Environmental

SYSTEM CALIBRATION AND DRIFT CALCULATIONS

CLIENT	RIGO+RIGO	DATE	NOV 19/95
PROJECT NUMBER	5416265	TIME START	09:00
SAMPLE LOCATION	STACK	TIME FINISH	13:46
	TEST NUMBER	T4CEMA	

INSTRUMENT SPAN VALUES

OXYGEN	25	%	CARBON DIOXIDE	20	%
SULPHUR DIOXIDE	1000	PPM	CARBON MONOXIDE	1000	PPM
NITROGEN OXIDES	1000	PPM	TOTAL HYDROCARBONS	100	PPM

ITEM	CAL.GAS VALUE	ANAL. CAL.	INITIAL VALUES SYSTEM CAL.	INITIAL VALUES SYSTEM CAL. BIAS (% SPAN)	FINAL VALUES SYSTEM CAL.	FINAL VALUES SYSTEM CAL. BIAS (% SPAN)	DRIFT (% SPAN)
O2 ZERO	0	0.03	0.07	0.2	0.1	0.3	0.1
O2 CAL	9.91	9.93	9.86	-0.3	10.1	0.7	1.0
SO2 ZERO	0	0.5	1.9	0.1	0.3	-0.0	-0.2
SO2 SPAN	149	149	144	-0.5	142	-0.7	-0.2
NOX ZERO	0	0.19	0.3	0.0	1.6	0.1	0.1
NOX SPAN	302	304	304	0.0	306	0.2	0.2
CO2 ZERO	0	0.04	0.05	0.1	0.07	0.2	0.1
CO2 SPAN	7.01	7.06	7.01	-0.2	7.03	-0.1	0.1
CO ZERO	0	-0.2	0.3	0.1	-0.07	0.0	-0.0
CO SPAN	100	98	99	0.1	99	0.1	0.0
THC ZERO	0	-0.1	0.35	0.5	1.96	2.1	1.6
THC SPAN	20.1	20.5	19.6	-0.9	21.6	1.1	2.0

DRIFT CRITERIA <5% SPAN

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO	DATE : 11.19.95
JOBSITE : LAYTON UTAH	RUN : T4-OC-A
REF.No. : 5416265	LOC. : STACK B

RUN TIME : 8:36 TO 11:02

ORGANICS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
ORGANICS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	1.7356 DSm3	61.284 DScf
AVERAGE ISOKINETICITY	100.9 %	

FLUE GAS CHARACTERISTICS

MOISTURE	13.47 %	
TEMPERATURE	204.4 deg C	399.9 deg F
FLOW	46461 DSm3/hr	27346 DScfm
	101419 Am3/hr	59693 Acfm
VELOCITY	19.79 m/s	3896.2 fpm

GAS ANALYSIS	O2	11.00 %
	CO2	9.30 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.04 g/gmole D.B.
	MOL. WT.	28.42 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO	DATE : 11.19.95
JOBSITE : LAYTON UTAH	RUN : T4-OC-A
REF.No. : 5416265	LOC. : STACK 8

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.0 kPa	25.40 in.Hg
STATIC PRESSURE	-112.1 Pa	-0.45 in.H2O
NOZZLE DIAMETER	5.79 mm	0.2280 in.
PITOT COEFFICIENT	0.796	
METER CORRECTION FACTOR	0.983	

CONDENSATE COLLECTION

RESIN TRAP CONDENSATE	4.8 g
CONDENSATION IN IMPINGER 1	167.7 g
CONDENSATION IN IMPINGER 2	7.2 g
CONDENSATION IN IMPINGER 3	0.2 g
CONDENSATION IN IMPINGER 4	0.7 g
SILICA GEL WEIGHT GAIN	18.2 g
TOTAL MOISTURE GAIN	198.8 g

ORGANICS COLLECTION

FILTER ORGANICS	0.0000 mg
WASHINGS ORGANICS	0.0000 mg
RESIN ORGANICS	0.0000 mg
IMPINGER ORGANICS	0.0000 mg
TOTAL ORGANICS	0.0000 mg

TOTAL SAMPLING TIME	120.0 min.

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.19.95
RUN : T4-OC-A
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1													
1	0.0	390	0.500	0.65	69.30	71	242	259	46	46	4.0	1.0	102.8
1	3.0	386	0.550	0.70	70.80	74	241	260	40	42	5.0	1.0	99.9
2	6.0	402	0.650	0.85	72.34	74	243	252	41	41	7.0	2.0	100.0
2	9.0	399	0.650	0.85	74.00	75	244	253	41	40	7.0	2.0	100.8
3	12.0	399	0.720	1.00	75.68	76	243	250	42	40	8.0	3.0	100.9
3	15.0	403	0.700	0.95	77.45	77	244	248	43	39	7.0	3.0	100.6
4	18.0	403	0.600	0.75	79.19	77	244	248	44	40	6.0	4.0	100.5
4	21.0	403	0.640	0.90	80.80	77	246	247	45	42	7.0	4.0	101.6
5	24.0	405	0.700	1.00	82.48	77	246	249	45	42	8.0	5.0	103.5
5	27.0	402	0.600	0.75	84.27	77	245	247	47	43	7.0	5.0	101.6
6	30.0	402	0.820	1.20	85.90	78	245	246	48	44	8.0	6.0	101.2
6	33.0	402	0.850	1.30	87.80	78	247	247	49	45	9.0	6.0	101.5
7	36.0	403	0.850	1.20	89.74	79	246	248	50	46	9.0	7.0	101.5
7	39.0	407	0.900	1.30	91.68	79	248	248	51	46	9.0	7.0	101.3
8	42.0	402	0.930	1.40	93.67	80	248	248	52	47	9.0	8.0	101.3
8	45.0	399	0.860	1.20	95.70	80	247	248	53	48	9.0	8.0	100.9
9	48.0	385	0.650	0.90	97.65	80	248	249	55	49	7.0	9.0	99.7
9	51.0	385	0.600	0.80	99.34	80	247	246	56	49	7.0	9.0	100.0
10	54.0	385	0.640	0.85	100.97	81	246	249	57	50	7.0	10.0	101.5
10	57.0	382	0.550	0.70	102.68	81	246	246	60	50	6.0	10.0	97.1
	60.0				104.20								
TRAVERSE NO. 2													
1	0.0	392	0.700	0.95	4.76	80	244	250	62	55	7.0	1.0	99.4
1	3.0	395	0.700	0.95	6.50	81	245	248	62	50	7.0	1.0	101.7
2	6.0	394	0.750	1.00	8.28	82	246	249	62	45	8.0	2.0	101.8
2	9.0	395	1.000	1.50	10.13	82	245	248	60	44	10.0	2.0	100.2
3	12.0	397	0.900	1.30	12.23	83	248	250	58	46	9.0	3.0	102.0
3	15.0	415	1.100	1.60	14.26	84	248	249	50	46	10.0	3.0	100.5
4	18.0	415	0.900	1.30	16.45	85	246	248	48	47	10.0	4.0	103.7
4	21.0	414	0.900	1.30	18.50	85	247	248	47	46	9.0	4.0	101.6
5	24.0	415	1.000	1.50	20.51	85	248	249	47	46	10.0	5.0	100.8
5	27.0	415	1.000	1.50	22.61	86	247	250	47	47	10.0	5.0	102.1
6	30.0	415	1.100	1.60	24.74	87	248	250	49	49	10.0	6.0	99.6
6	33.0	417	1.100	1.60	26.92	87	249	250	48	50	11.0	6.0	101.5
7	36.0	412	0.750	1.00	29.14	87	251	250	49	50	8.0	7.0	99.7

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.19.95
RUN : T4-OC-A
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	408	0.920	1.40	30.95	88	249	251	50	50	9.0	7.0	101.7
8	42.0	408	0.850	1.20	33.00	88	250	251	51	51	9.0	8.0	102.6
8	45.0	404	0.850	1.20	34.99	88	248	249	51	51	9.0	8.0	99.8
9	48.0	388	0.600	0.80	36.93	88	248	250	53	50	7.0	9.0	98.7
9	51.0	384	0.600	0.85	38.56	88	248	250	54	50	7.0	9.0	101.5
10	54.0	390	0.700	0.95	40.24	88	248	250	56	51	8.0	10.0	100.5
10	57.0	380	0.600	0.80	42.03	88	248	250	57	51	7.0	10.0	98.3
	60.0				43.66								
		400	0.766	1.09		81	246	249	51	47	8.0		100.9

ISOKINETIC TEST DATA FORM

Sample Type: Organics Reference Method: EPA M23 Page 1 of 5

Client:	Rigo + Rigo	City, Province:	Layton, UTAH
Project Number:	541625	Test Number:	T4-OCA
Sample Location:	B Stack	Date:	Nov 19/95
Start Time:	8:36 am	Finish Time:	11:02
Barometric Press. (in Hg):	25.40	Stack Press(in H_2O): + or -:	-0.45
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes (No)

Sample Box Number:	T1	Gas Meter Factor:	0.983	Calibration Date:	Sept 19/95
Nozzle I.D.:	T1-2	Nozzle Diameter (in.):	0.228	Calibration Date:	Nov 16/95
Probe I.D.:	T2-7	Pitot Coefficient:	0.796	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): _____ O_2 (%): _____ CO (ppm): _____ Other: _____

Impinger 1 (g)	167.7	Assumed H_2O (%):	14
Impinger 2 (g)	7.2	Filter I.D. #:	—
Impinger 3 (g)	0.2	Net Filter Wt. (g):	—
Impinger 4 (g)	0.7	Net Probe Wash Wt. (g):	—
Impinger 5 (g) S.G.	18.2	Imp. Residue Wt. (g):	—
~~Impinger 6 (g)~~ Coil	4.8		
XAD-2 Trap (g)			
Total H_2O Condensed (g)	198.8		

Sampling Comments: Train 02 (reused after T2-OCA) Trap 12

Process Rate: _____

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: Nov 19/95

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	Rigo + Rigo
Date:	Nov 19/95	Test:	T4 - OCA
Sample Location:	B Stack	Filter I.D.:	—
Pre Weights by:	HVB	Post Weights by:	HVB

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	MT	597.6	429.9	167.7 ✓
2	ROOT	614.3	607.1	7.2 ✓
3	ROOT	563.3	563.1	0.2 ✓
4	MT	477.9	477.2	0.7 ✓
5	S.G	785.5	767.3	18.2 ✓
~~6~~				
~~7~~				
~~8~~ Coil	} with foil, box,	730.4	725.6	4.8 ✓
XAD Trap	} clamp, hose			
			Total (g)	198.8 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: Train 02 (reused after T2-OCA)
Trap 13

Signature: _____ Date: Nov. 19/95

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BOVAR-CONCORD Environmental

DATE: 12 / 11 / 95

SAMPLING TRAINS DATA SHEET

Client: Rigo + Rigo | Project #: 5416265 | Sample Location: B Stack | Operators: HVB

Run #: T4-OCA | Traverse #: 1 | Traverse Direction: North | Start Time: 8:36 | Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		0.50	.65	.499	69.30	390	242	259	46	46	72	70	4
	3		0.55	.70	.524	70.80	386	241	260	42	40	75	72	5
2	6		0.65	.85	.569	72.34	402	243	252	41	41	76	72	7
	9		0.65	.85	.569	74.00	399	244	253	40	41	77	73	7
3	12		0.72	1.0	.599	75.68	399	243	250	40	42	78	73	8
	15		0.70	.95	.591	77.45	403	244	248	39	43	79	74	7
4	18		0.60	.75	.547	79.19	403	244	248	40	44	79	74	6
	21		0.64	.90	.565	80.80	403	246	247	42	45	79	74	7
5	24		0.70	1.0	.591	82.48	405	246	249	42	45	80	74	8
	27		0.60	.75	.547	84.27	402	245	247	43	47	80	74	7
6	30		0.82	1.2	.639	85.90	402	245	246	44	48	81	75	8
	33		0.85	1.3	.651	87.80	402	247	247	45	49	81	75	9

Pre test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 69.02 Leak Volume End: 69.30

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: HVB

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BOVAR-CONCORD Environmental

DATE: 9/16/95

SAMPLING TRAINS DATA SHEET

Client: Rigo + Rigo | Project #: 5416265 | Sample Location: B Stack | Operators: HWB

Run #: T4-OCA | Traverse #: 1 | Traverse Direction: North | Start Time: _____ | Finish Time: 9:36

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.85	1.2	.651	89.74	403	246	248	46	50	82	75	9
	39		0.90	1.3	.670	91.68	407	248	248	46	51	82	76	9
8	42		0.93	1.4	.681	93.67	402	248	248	47	52	83	76	9
	45		0.86	1.2	.655	95.70	399	247	248	48	53	83	77	9
9	48		0.65	.90	.569	97.65	385	248	249	49	55	83	77	7
	51		0.60	.80	.547	99.34	385	247	246	49	56	83	77	7
10	54		0.64	.85	.565	100.97	385	246	249	50	57	83	78	7
	57		0.55	.70	.524	102.68	382	246	246	50	60	83	78	6
	60					104.20								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 104.20 Leak Volume End: 104.51

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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DATE: 9/16/95

SAMPLING TRAINS DATA SHEET

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: HUB

Run #: T4-OCA Traverse #: 2 Traverse Direction: East Start Time: 10:02 Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		0.70	.95	.591	4.76	392	244	250	55	62	80	79	7
	3		0.70	.95	.591	6.50	395	245	248	50	62	82	79	7
2	6		0.75	1.0	.611	8.28	394	246	249	45	62	84	80	8
	9		1.0	1.5	.706	10.13	395	245	248	44	60	84	80	10
3	12		0.90	1.3	.670	12.23	397	248	250	46	58	86	80	9
	15		1.1	1.6	.740	14.26	415	248	249	46	50	87	81	10
4	18		0.90	1.3	.670	16.45	415	246	248	47	48	88	82	10
	21		0.90	1.3	.670	18.50	414	247	248	46	47	88	82	9
5	24		1.0	1.5	.706	20.51	415	248	249	46	47	88	82	10
	27		1.0	1.5	.706	22.61	415	247	250	47	47	89	83	10
6	30		1.1	1.6	.740	24.74	415	248	250	49	49	90	83	10
	33		1.1	1.6	.740	26.92	417	249	250	50	48	90	83	11

Pre test leak check: Rate (cfm) 0.006 at 15 inches Hg (Vacuum) Leak Volume Start: 4.51 Leak Volume End: 4.76

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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DATE: 9/11/95

SAMPLING TRAINS DATA SHEET

Client: Rigo + Rigo | Project #: 5416265 | Sample Location: B Stack | Operators: HOB

Run #: T4-OCA | Traverse #: 2 | Traverse Direction: East | Start Time: _____ | Finish Time: 11:02

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.75	1.0	.611	29.14	412	251	250	50	49	90	84	8
	39		0.92	1.4	.677	30.95	408	249	251	50	50	91	87	9
8	42		0.85	1.2	.651	33.00	408	250	251	51	51	91	85	9
	45		0.85	1.2	.651	34.99	404	248	249	51	51	91	85	9
9	48		0.60	0.8	.547	36.93	388	248	250	50	53	91	85	7
	51		0.60	0.85	.547	38.56	384	248	250	50	54	91	85	7
10	54		0.70	0.95	.591	40.24	390	248	250	51	56	91	85	8
	57		0.60	0.8	.547	42.03	380	248	250	51	57	91	85	7
	60					43.66								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .009 at 15 inches Hg (Vacuum) Leak Volume Start: 43.66 Leak Volume End: 44.008

K value calculated by: _____ Checked by: _____ Operator Signature: H.L. Bell

PROJECT # 5416265 DATE: Nov 19/95 TEST T4-OCA

Client: Rigo + Rigo Location: B Stack Operator: HVB

Sample Type: Organics Reference Method: EPA M23

Modifications: Using Environment Canada recovery procedure
train rinse with acetone/DCM + proving rinse with toluene
Train 02 (re used after T2-OCA)

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	.86 in H_2O
Static positive or negative	⟷	-ve
Average Temperature	⟷	400 °F
Estimate % H_2O	⟷	14
How estimated?	⟷	T1-OCA results
Estimate Gas Composition	⟷	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	⟷	T1-CEMA
Proper nozzle selected?	✓	
K factor	⟷	.706 at 400 °F
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other	✓	Watch
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	Proving rinse after T3-OCB
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	Proving rinse after T3-OCB
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5416265 DATE: Nov 19/95 TEST T4-OCA

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	⟷	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type	K	
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	Proving of Train 02 after T2-OCA
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	✓	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	Proving of Train 02 after T2-OCA
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 5411265 DATE: Nov 19/95 TEST T4-0CA

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	Proving of Train 02 after T2-0CA
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	MT
#2	⟷	RODI
#3	⟷	RODI
#4	⟷	MT
#5	⟷	S.G.
~~#6~~	⟷	
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	⟷	
Grease used on joints	X	
Silica gel type	⟷	
New?	✓	
Used?		
Pre Test Leak Check	✓	
Performed	✓	
Rate	⟷	0.01 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	New - Good
Leak checks at port changes Before	⟷	0.011 cfm@ 15 "Hg
After	⟷	0.006 cfm@ 15 "Hg
Final leak race acceptable	⟷	0.009 cfm@ 15 "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	RB / JA
Clean-up area - General Environment	⟷	Clean
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 541265 DATE: Nov 19/95 TEST T4-OCDF

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	⟷	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass		cleaned foil in plastic bag
plastic		
Balance Type	⟷	top loader
Calibrated or QC checked	⟷	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered		
Silica Gel		
Condition/Colour		20% spent
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		Clean
Colour of Filter		greyish white - effin fast
Foil Wrapped?	✓	
Probe Rinses		
Acetone 1) DCM	✓	
Other Toluene	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed		
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

#4

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: B- STACK TEST #: T4 - OCA DATE: NOV 19 | 95 PROJECT NO.: 541 - 6265

Nozzle, Probe Liner Front Half Filter Holder, All equipment	Filter	Back Half Filter Holder and Condenser Coil, All equipment	XAD Resin	Impingers & ~~HPLC~~ Rinse RnDI	Back Half Rinse
Wash and brush 3x each with ~~hexane~~ DCM and acetone. Rinse 3x with with ~~hexane~~ DCM and and acetone.	Remove and place on pre-cleaned foil fold in half and place in ~~petri dish~~. Zip Loc bag	**Weigh Coil & Record Weight** ~~Soak 5 minutes each with hexane and acetone. Rinse 3x with hexane and acetone.~~ TOLUENE Pool	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into container. ~~Rinse 3x with HPLC~~ water.	Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone.

Container ~~TS1~~ TS2 ~~Front Half~~ Acetone ~~Hexane~~ Rinse DCM	
Final Wt.:	531.6
Initial Wt.:	265.0
Gain:	266.6

Container ~~TS2~~ TS1 Filter	
Filter ID:	T4-OCA
Colour:	greyish/white

Container TS3 Back Half Filter and Condenser Coil	
Final Wt.:	501.0
Initial Wt.:	265.3
Gain:	235.7
Colour:	Clear

Container TS4 XAD Resin

Wrap in Foil	
XAD:	046625
Colour:	White

TRAP 12

Container TS5 Impinger Contents	
Final Wt.:	669.7
Initial Wt.:	264.6
Gain:	405.1
Colour:	

Container TS6 Back Half Rinse	
Final Wt.:	
Initial Wt.:	
Gain:	
Colour:	

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	02
RnDI ~~HPLC~~ Batch No.:	Zenon 95/10/26
Acetone Batch No.:	Caledon 14123
DCM ~~Hexane~~ Batch No.:	Caledon 16700
Filter Batch No.:	Zenon 95/10/26 XAD No.: Trap 12
Train Assembled By:	HVB
Train Recovered By:	RB

Reagent Blanks Collected?	Yes
Combined Acetone/~~Hexane~~ DCM	
Combined Glycol/Water	
Blank Train Collected?	
Comments:	

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 19
RUN : T4-MP-A
LOC. : B STACK

RUN TIME : 11:25 TO 13:43

METALS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
METALS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	2.1884 DSm3	77.275 DScf
AVERAGE ISOKINETICITY	105.9 %	

FLUE GAS CHARACTERISTICS

MOISTURE	13.06 %	
TEMPERATURE	211.0 deg C	411.8 deg F
FLOW	48735 DSm3/hr	28684 DScfm
	105700 Am3/hr	62213 Acfm
VELOCITY	20.63 m/s	4060.7 fpm

GAS ANALYSIS	O2	11.00 %
	CO2	9.30 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.04 g/gmole D.B.
	MOL. WT.	28.47 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 19
RUN : T4-MP-A
LOC. : B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	87.4 kPa	25.80 in.Hg
STATIC PRESSURE	-132.0 Pa	-0.53 in.H2O
NOZZLE DIAMETER	6.20 mm	0.2440 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	150.8 g
CONDENSATION IN IMPINGER 2	66.8 g
CONDENSATION IN IMPINGER 3	9.1 g
CONDENSATION IN IMPINGER 4	1.4 g
CONDENSATION IN IMPINGER 5	0.2 g
CONDENSATION IN IMPINGER 6	-0.9 g
SILICA GEL WEIGHT GAIN	14.5 g
TOTAL MOISTURE GAIN	241.9 g

METALS COLLECTION

FILTER METALS	0.0000 mg
WASHINGS METALS	0.0000 mg
IMPINGER METALS	0.0000 mg
TOTAL METALS	0.0000 mg

TOTAL SAMPLING TIME 120.0 min.

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 19
RUN : T4-MP-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	409	0.670	1.35	94.40	84	241	251	51	1.0	1.0	100.6
1	3.0	412	0.780	1.60	96.32	85	242	251	46	1.0	1.0	103.0
2	6.0	411	0.710	1.40	98.44	86	243	253	43	1.0	2.0	104.2
2	9.0	410	0.720	1.50	100.49	86	248	252	41	1.0	2.0	104.8
3	12.0	412	0.750	1.60	102.57	87	248	254	41	1.0	3.0	105.6
3	15.0	413	0.710	1.45	104.71	88	256	253	41	1.0	3.0	106.0
4	18.0	412	0.710	1.45	106.80	88	251	254	42	1.0	4.0	105.4
4	21.0	415	0.800	1.65	108.88	88	251	255	43	1.0	4.0	105.2
5	24.0	415	0.650	1.35	111.08	89	252	255	44	1.0	5.0	106.9
5	27.0	412	0.650	1.30	113.10	88	252	254	44	1.0	5.0	105.2
6	30.0	412	0.900	1.90	115.09	89	252	255	45	1.0	6.0	105.3
6	33.0	410	0.900	1.90	117.43	89	252	254	44	1.0	6.0	105.1
7	36.0	411	0.940	1.95	119.77	89	252	255	45	1.0	7.0	105.6
7	39.0	414	1.000	2.25	122.17	88	252	256	45	1.0	7.0	109.1
8	42.0	414	0.980	2.15	124.72	88	251	257	46	1.0	8.0	106.8
8	45.0	405	0.850	1.80	127.19	88	251	254	46	1.0	8.0	105.6
9	48.0	401	0.500	0.95	129.48	87	250	253	47	1.0	9.0	109.7
9	51.0	402	0.600	1.00	131.31	87	249	252	47	1.0	9.0	104.1
10	54.0	401	0.620	1.10	133.21	87	248	256	46	1.0	10.0	104.5
10	57.0	400	0.600	1.00	135.15	87	249	256	46	1.0	10.0	105.6
	60.0				137.08							
TRAVERSE NO. 2												
1	0.0	407	0.950	2.05	137.86	84	246	256	50	1.0	1.0	107.0
1	3.0	418	0.990	2.25	140.29	85	247	256	42	1.0	1.0	108.8
2	6.0	413	0.690	1.50	142.80	86	248	253	42	1.0	2.0	108.4
2	9.0	413	0.870	1.70	144.90	86	249	255	43	1.0	2.0	101.2
3	12.0	414	0.910	2.00	147.10	86	248	253	42	1.0	3.0	107.7
3	15.0	414	0.910	1.95	149.49	86	249	254	43	1.0	3.0	107.6
4	18.0	415	0.950	2.15	151.88	86	250	255	44	1.0	4.0	106.8
4	21.0	416	1.100	2.25	154.30	86	250	255	44	1.0	4.0	106.3
5	24.0	417	1.100	2.20	156.89	86	251	254	44	1.0	5.0	107.1
5	27.0	416	0.950	2.10	159.50	86	252	255	46	1.0	5.0	105.9
6	30.0	414	0.950	2.10	161.90	86	252	258	46	1.0	6.0	106.2
6	33.0	415	1.000	2.20	164.31	87	253	257	47	1.0	6.0	106.4
7	36.0	412	0.750	1.40	166.79	87	253	259	47	1.0	7.0	108.5

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 19
RUN : T4-MP-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	412	0.850	1.70	168.99	87	253	259	48	1.0	7.0	102.6
8	42.0	413	0.890	1.85	171.20	87	253	259	47	1.0	8.0	105.4
8	45.0	415	0.950	2.10	173.52	87	253	258	47	1.0	8.0	107.0
9	48.0	414	0.910	2.00	175.95	86	252	258	48	1.0	9.0	106.2
9	51.0	415	0.930	2.00	178.31	86	252	258	48	1.0	9.0	106.5
10	54.0	415	1.000	1.15	180.70	86	251	256	48	1.0	10.0	107.1
10	57.0	413	0.800	1.65	183.20	86	250	256	50	1.0	10.0	105.5
	60.0				185.40							
		412	0.831	1.72		87	250	255	45	1.0		105.9

ISOKINETIC TEST DATA FORM

Sample Type: M5 Reference Method: EPA M29 Page 1 of 5

Client:	Rizo + Rizo	City, Province:	Carbon Utah
Project Number:	541605	Test Number:	T4-MP-A
Sample Location:	B Stack	Date:	95 11 19
Start Time:	11:25	Finish Time:	13:43
Barometric Press. (in Hg):	25.8" Hg.	Stack Press(in H_2O): + or -:	-.53
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	110	Cyclonic Flow:	Yes No ✓

Sample Box Number:	T3	Gas Meter Factor:	1.0060	Calibration Date:	Sept/95
Nozzle I.D.:	Q2 AWB	Nozzle Diameter (in.):	.244 AWB	Calibration Date:	Nov/95
Probe I.D.:	T1-7'	Pitot Coefficient:	.798 AWB	Calibration Date:	Sept/95

Equipment Comments:

STACK GAS COMPOSITION

CO_2 (%): ______ 0_2 (%): ______ CO (ppm): ______ Other: ______

Impinger 1 (g)	150.9	Assumed H_2O (%):	14
Impinger 2 (g)	66.8	Filter I.D. #:	5109-13
Impinger 3 (g)	9.1	Net Filter Wt. (g):	—
Impinger 4 (g)	1.4	Net Probe Wash Wt. (g):	—
Impinger 5 (g)	0.2	Imp. Residue Wt. (g):	—
Impinger 6 (g)	-.9		
~~XAD-2 Trap~~ (g) S.G.	14.5		
Total H_2O Condensed (g)	241.9		

Sampling Comments:

Process Rate:

Control Equipment Operation: Normal Temp - High Load - with AC

Process Comments:

Signature: [signature] Date: 95/11/19

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BOVAR-CONCORD Environmental

MOISTURE ANALYSIS DATA SHEET

Project #:	5716265	Client:	R106 R106
Date:	95.11.19	Test:	T4-IMP-A
Sample Location:	STACK B	Filter I.D.:	5705-D
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	BLANK	650.4	499.6	150.8 ✓
2	100ml 5% HNO_3 & 10% H_2O_2	634.7	567.9	66.8 ✓
3	100ml 5% HNO_3 & 10% H_2O_2	627.1	618.0	9.1 ✓
4	BLANK	492.4	491.0	1.4 ✓
5	ACIDIFIED KMnO4 100ml	596.3	596.1	0.2 ✓
6	ACIDIFIED KMnO4 100ml	605.4	606.3	-.9 ✓
7	Silica Gel	796.1	781.6	14.5 ✓
8				
XAD Trap				
			Total (g)	241.9 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	147.5	147.6	✓	JA
Post weights	147.5	147.6	✓	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.19

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BOVAR-CONCORD Environmental

DATE: 8/11/19 SAMPLING TRAINS DATA SHEET

Client: [illegible] Project #: 546265 Sample Location: B Stack Operators: JL/JM

Run #: TY MP-A Traverse #: 2 Traverse Direction: [illegible] Start Time: 12:43 Finish Time: 13:43

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.95	2.05		137.861	407	246	250	50	NA	85	83	1.0
1	3		0.99	2.25	140.292	140.29	418	247	250	42		87	83	1.0
2	6		0.69	1.5	*142.736	142.80	413	248	253	42		87	84	1.0
2	9		0.87	1.7	144.842	144.90	413	249	255	43		87	84	1.0
3	12		0.91	2.0	*147.193	147.10	414	248	253	42		87	84	1.0
3	15		0.91	1.95	149.445	149.49	414	249	254	43		87	84	1.0
4	18		0.95	2.15	*151.885	151.88	415	250	258	44		87	84	1.0
4	21		1.1	2.25	154.270	154.30	416	250	255	44		87	84	1.0
5	24		1.1	2.2	*156.883	156.89	417	251	254	44		88	84	1.0
5	27		0.95	2.1	159.47	159.50	416	252	255	46		88	84	1.0
6	30		0.95	2.1	*161.896	161.90	414	252	258	46		88	84	1.0
6	33		1.0	2.2	164.286	164.31	415	253	257	47		89	85	1.0
7	36		.75	1.4	*166.769	166.79	412	253	259	47		89	85	1.0

Pre test leak check: Rate (cfm) .009 at 15 inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

Post test leak check: Rate (cfm) .012 at 15 inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

K value calculated by: ______ Checked by: ______ Operator Signature: JW

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BOVAR-CONCORD Environmental

DATE: 5/11/16 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Nippon Steel Project #: 5416265 Sample Location: B Stack Operators: SW/JM

Run #: 74-IMP-A Traverse #: 2 Traverse Direction: OUT Start Time: 12:43 Finish Time: 13:43

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	39		.85	1.7	168.919	168.99	412	253	259	43	N/A	89	85	1.0
8	42		.89	1.85	*171.757	171.80	413	253	259	47		88	85	1.0
8	45		0.95	2.1	173.583	173.52	415	253	258	47		88	85	1.0
9	48		0.91	2.0	*175.910	175.95	414	252	258	48		88	84	1.0
9	51		0.93	2.0	178.295	178.31	415	252	258	48		88	84	1.0
10	54		1.0	1.15	*180.681	180.70	415	251	256	48		83	84	1.0
10	57		0.80	1.05	183.159	183.20	413	250	256	50		87	84	1.0
10	60				185.359	185.404								

Pre test leak check: Rate (cfm) .009 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .012 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 95 / 11 / 19

SAMPLING TRAINS DATA SHEET

Client: Paso Mesa Project #: 5411265 Sample Location: B Stack Operators: SD/JM

Run #: TY-IMP-A Traverse #: 1 Traverse Direction: OUT Start Time: 11:25 Finish Time: 12:25

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.67	1.35		94.401	409	241	251	57	NA	85	83	1.0
1	3		0.78	1.60	96.414	96.32	412	242	251	46		87	83	1.0
2	6		0.71	1.4	*98.491	98.44	411	243	253	43		88	83	1.0
2	9		0.72	1.5	100.512	100.49	410	248	252	41		89	83	1.0
3	12		0.75	1.6	*102.576	102.57	412	248	254	41		90	84	1.0
3	15		0.71	1.45	104.699	104.71	413	256	253	41		90	85	1.0
4	18		0.71	1.45	*106.787	106.80	412	257	254	42		90	85	1.0
4	21		0.80	1.65	108.877	108.88	415	251	255	43		90	86	1.0
5	24		0.65	1.35	*111.079	111.08	415	252	255	44		91	86	1.0
5	27		0.65	1.3	113.062	113.10	412	252	254	44		90	86	1.0
6	30		0.9	1.9	*115.082	115.09	412	252	255	45		90	87	1.0
6	33		0.9	1.9	117.423	117.43	410	252	254	44		90	87	1.0
7	36		0.94	1.95	*119.763	119.77	411	252	255	45		90	87	1.0

Pre test leak check: Rate (cfm) .009 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .009 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 5/11/19 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: Dynegy Project #: 54116565 Sample Location: B Stack Operators: SW/TM

Run #: T4-MB-A Traverse #: 1 Traverse Direction: OUT Start Time: 11:25 Finish Time: 12:25

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
~~7~~	39		1.0	2.5	122.154	122.17	414	252	250	45	NA	89	87	1.0
8	42		0.98	2.15	*124.679	124.72	414	251	257	46		89	87	1.0
8	45		0.85	1.8	127.154	127.19	405	251	254	46		89	87	1.0
9	48		0.50	0.95	*129.457	129.48	401	250	253	47		88	86	1.0
9	51		0.60	1.0	131.219	131.31	402	249	252	47		88	86	1.0
10	54		0.62	1.1	*133.24	133.21	401	248	256	46		88	86	1.0
10	57		0.60	1.0	135.179	135.~~1~~.15	400	249	256	46		88	86	1.0
10	100				137.082	137.079								

Pre test leak check: Rate (cfm) .009 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .004 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 5916765 DATE: 9/1/19 TEST T4-MF-A

Client: Argo+Kiyo Location: B Stack Operator: JL

Sample Type: M5 Reference Method: EPA M29

Modifications:

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	
Static positive or negative	⟷	neg.
Average Temperature	⟷	
Estimate % H_2O	⟷	14
How estimated?	⟷	M5
Estimate Gas Composition	⟷	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	⟷	CEM
Proper nozzle selected?		
K factor	⟷	
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	5
Number of readings per point	⟷	1
Barometric Pressure Measured?	✓	
Mercury		
Aneroid		
Other		watch.
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or		
Quartz	✓	
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or		
Quartz or	✓	
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5911 0265 DATE: 9511 19 TEST TY-MP-A

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	----	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre		
Quartz	✓	
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	✓	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol		
Thermocouple attached to trap	N/A	
XAD-2 Trap covered with foil at all times		

PROJECT # 5411265 DATE: 9/5/14 TEST TY-MM-A

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	7	
Contents #1		
#2		
#3		
#4		
#5		
#6		
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications		
Grease used on joints	✓	
Silica gel type		
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate		.004 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	N/A	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel		
Leak checks at port changes Before		.005 cfm@ 15 "Hg
After		.004 cfm@ 15 "Hg
Final leak race acceptable		.012 cfm@ 15 "Hg
General comments on sampling technique		
Sample recovery performed on-site?	✓	
Sample recovery performed by		SA
Clean-up area - General Environment		
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

QA/QC CHECKLIST

PROJECT # 54164?5   DATE: 951114   TEST T4-MP-A

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:	✓	
Borosilicate glass		
Polyethylene		
Cap Material	----	teflon
Leak free	✓	
Petri Dishes: borosilicate glass		
plastic	✓	
Balance Type	----	digital toploader
Calibrated or QC checked	----	Actual ______ (g) Measured ______ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel	✓	
Condition/Colour		pink/blue
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		
Colour of Filter		
Foil Wrapped?	X	
Probe Rinses		
Acetone	✓	
Other		
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin		
Blank Train		
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: STACK B TEST #: T4-MP-A DATE: 95.11.19 PROJECT NO.: 5916265

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	Container TS3 Front Half 0.1 N HNO3 Rinse Final Wt.: 447.7 Initial Wt.: 262.6 Gain: 185.1 Comments:	Brush loose particulate onto filter	Container TS4-1 Impinger 4 Contents Final Wt.: 676.1 Initial Wt.: 262.6 Gain: 413.5	Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse Final Wt.: 533.4 Initial Wt.: 262.6 Gain: 270.8 Colour: CLEAR	Rinse with 100 mL 0.1 N HNO3 Container TSA Impinger 4 Contents Final Wt.: 407.9 Initial Wt.: 262.4 Gain: 145.5	Rinse 3x with 100 mL Acidified KMnO4 Rinse with 100 mL water Container 5B Impinger 5 & 6 KMnO4 Content and Rinses Final Wt.: 701.2 Initial Wt.: 262. Gain: 439.2 Colour: PURPLE	Place rinsing in Container 5C which contains 200 mL of water Container 5C HCL Rinse Final Wt.: 517.6 Initial Wt.: 262.4 Gain: 255.2 Colour: CLEAR	
Container TS2 Front Half Acetone Rinse Final Wt.: 335.8 Initial Wt.: 262.3 Gain: 73.5 Comments:		Filter TS2 Seal petri dish with tape Colour: BIGE Filter #: 5108A BE ZENON-102523						

filters sticky, static and crumbling difficult to recover properly

Train Identification	Blanks	
Train No.:		
HNO3 / H2O2 Batch No.:	Container 9	200 mLs
DI Water Batch No.:	Container 8B	100 mLs
Acetone Batch No.:	Container 7	100 mLs
0.1 N HNO3 Batch No.:	Container 8A	300 mLs
Acidified KMnO4 Batch No.:	Container 10	100 mLs
8 N HCl / Batch No.: DI Water	Container 11	25 mL / 200 mL
Filter Number:	Container 12	* _____

Mark Liquid Level on Containers
Seal and Label Containers
Reagent Blanks Submitted? Yes ✓ No ____
Prepare Fresh Acidified KMnO4 Daily ✓

probe wash

BOVAR-CONCORD Environmental

NOVEMBER 20, 1995

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	Riley + Riley
Date:	Nov 20/95	Test:	T6-OCA
Sample Location:	B Stack	Filter I.D.:	
Pre Weights by:	HVB	Post Weights by:	HVB

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	MT	591.8	425.8	166.0
2	ROOI	598.6	597.0	1.6
3	ROOI	593.9	593.9	0.0
4	MT	491.4	492.6	-1.2
5	S.G	813.0	804.2	8.8
6				
7				
~~8~~ Condenser	only	290.3	290.3	0.0
XAD Trap	only	337.5	337.2	0.3
			Total (g)	175.5

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: Train 01 (reused after T5-OCB)
Trap 17

Signature: [signature]

Date: Nov 20/95

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BOVAR-CONCORD Environmental

[signature]

DATE: 10/11/95

SAMPLING TRAINS DATA SHEET

Client: Rigo & Rigo Project #: 5416265 Sample Location: B Stack Operators: HOB

Run #: T6-0CA Traverse #: 1 Traverse Direction: North Start Time: 9:00 am Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		0.50	0.65	.499	23.66	395	240	257	42	42	65	65	3
	3		0.50	0.65	.499	25.09	395	243	256	41	42	67	65	4
2	6		0.50	0.65	.499	26.54	394	244	262	40	42	68	65	4
	9		0.55	0.7	.524	28.00	396	243	262	39	42	70	65	5
3	12		0.60	0.70	.547	29.52	402	244	268	39	43	72	66	4
	15		0.60	.75	.547	31.10	403	245	269	40	43	72	67	5
4	18		0.50	.70	.499	32.69	402	249	274	40	43	73	67	4
	21		0.50	.70	.499	34.14	402	246	263	41	43	73	67	4
5	24		0.60	.75	.547	35.60	404	246	253	40	42	73	67	5
	27		0.64	.85	.565	37.20	405	245	253	40	42	73	67	5
6	30		0.80	1.0	.631	38.87	406	245	249	40	41	73	67	5
	33		0.85	1.2	.651	40.71	406	245	249	40	42	74	68	6

Pre test leak check: Rate (cfm) 0.01 at 16 inches Hg (Vacuum) Leak Volume Start: 22.83 Leak Volume End: 23.66

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: HOB

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BOVAR-CONCORD Environmental

HB

DATE: 12/11/95 SAMPLING TRAINS DATA SHEET PAGE 3 OF 5

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: HVE

Run #: T6-OCA Traverse #: 1 Traverse Direction: North Start Time: _____ Finish Time: 10:00 am

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	36		0.96	1.4	.692	42.61	408	247	249	40	42	74	68	6
	39		0.97	1.2	.639	44.65	404	246	248	40	42	75	70	6
8	42		0.78	1.0	.623	46.57	~~400~~	~~246~~	247	41	43	76	70	5
	45		0.86	1.2	.655	48.39	401	246	248	41	43	76	70	5
9	48		0.55	0.8	.524	50.30	385	246	248	41	43	77	72	5
	51		0.55	0.85	.584	51.85	375	246	248	42	43	77	72	5
10	54		0.50	0.7	.506	53.47	375	248	249	43	43	77	72	4
	57		0.50	0.7	.506	55.00	376	248	248	43	44	78	72	4
	60					56.50								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.007 at 15 inches Hg (Vacuum) Leak Volume Start: 56.50 Leak Volume End: 56.75

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 20/11/95 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: MVB

Run #: T6-0CA Traverse #: 2 Traverse Direction: East Start Time: 10:18 am Finish Time: _____

Pt. (Far Wall)	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.75	1.0	.611	57.02	395	246	250	53	47	76	75	5
	3		0.72	.95	.599	58.82	400	246	243	41	48	78	74	5
2	6		0.78	1.2	.623	60.58	400	244	244	40	49	80	75	6
	9		0.78	1.2	.623	62.46	399	245	244	40	49	81	76	6
3	12		0.74	1.0	.607	64.31	398	247	248	41	51	81	76	5
	15		0.74	1.0	.607	66.10	398	247	248	41	51	81	76	5
4	18		0.81	1.2	.635	67.88	398	247	248	42	55	83	76	6
	21		0.81	1.2	.635	69.77	398	247	247	43	55	83	77	5
5	24		0.82	1.2	.639	71.65	398	247	247	44	55	84	78	5
	27		0.78	1.2	.623	73.54	397	249	249	44	55	84	78	5
6	30		0.88	1.3	.662	75.40	399	247	247	44	56	85	78	6
	33		0.96	1.4	.692	77.38	401	248	247	44	56	85	78	6

Pre test leak check: Rate (cfm) 0.000 at 15 inches Hg (Vacuum) Leak Volume Start: 56.75 Leak Volume End: 57.02

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 12 / 11 / 95 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rego + Rego Project #: 5416265 Sample Location: B Stack Operators: HVB

Run #: T6-OCA Traverse #: 2 Traverse Direction: East Start Time: _____ Finish Time: 11:18 am

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.84	1.2	.647	79.45	400	247	245	44	58	85	79	5
	39		0.76	1.1	.615	81.39	399	248	246	44	55	85	78	5
8	42		0.80	1.1	.631	83.22	397	248	248	45	55	85	78	5
	45		0.80	1.1	.631	85.09	395	247	248	45	56	85	78	5
9	48		0.70	1.0	.591	86.96	394	249	247	45	57	85	78	5
	51		0.62	0.9	.556	88.70	394	247	247	46	58	85	78	4
10	54		0.60	0.9	.555	90.34	375	247	247	46	58	85	78	4
	57		0.60	0.9	.555	92.00	380	246	247	46	59	85	78	4
	60					93.65								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.009 at 15 inches Hg (Vacuum) Leak Volume Start: 93.65 Leak Volume End: 93.91

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: Nov 20/95 TEST T6-OCA

Client: Rigo + Rigo Location: B Stack Operator: HCB
Layton, UTAH
Sample Type: Organics Reference Method: EPA M23
Modifications: Recovery using Environmental Canada procedure, train rinse with acetone/DCM followed by proving rinse with toluene

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	0.86 in H_2O
Static positive or negative	⟷	-ve
Average Temperature	⟷	400°F
Estimate % H_2O	⟷	14
How estimated?	⟷	previous tests
Estimate Gas Composition	⟷	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	⟷	Bovar CEM previous tests
Proper nozzle selected?	✓	
K factor	⟷	.706 at 400°F
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other	✓	watch
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	Proving following B1-OC
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	Proving following B1-OC
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

HCB

PROJECT # 5416265 DATE: Nov 20/95 TEST TG-OCA

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	⟷	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type	K	
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	Proving of Train ok after T5-OCB
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	Proving of Train ok after T5-OCB
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 5416265 DATE: Nov 20/95 TEST T6-OCA

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	Proving / Train ok after T5-OCB
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	MT
#2	⟷	ROOI
#3	⟷	ROOI
#4	⟷	MT
#5	⟷	S-G
~~#6~~	⟷	
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	⟷	
Grease used on joints	X	
Silica gel type	⟷	
New?		
Used?	✓	
Pre Test Leak Check		
Performed	✓	
Rate	⟷	0.01 cfm@ 16 "Hg
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	80% spent
Leak checks at port changes Before	⟷	0.007 cfm@ 15 "Hg
After	⟷	0.006 cfm@ 15 "Hg
Final leak race acceptable	⟷	cfm@ "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	RB / JA
Clean-up area - General Environment	⟷	
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

QA/QC CHECKLIST

PROJECT # 5416265 DATE: Nov 20/95 TEST TG-OCDE

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	⟷	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass		cleaned foil in plastic bag
plastic		
Balance Type	⟷	Top loader
Calibrated or QC checked	⟷	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently		
Probe and sample train openings covered		
Silica Gel		
Condition/Colour		80% spent
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		Good
Colour of Filter		white
Foil Wrapped?	✓	
Probe Rinses		
Acetone / DCM	✓	
~~Other~~ DCM/MA Toluene	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

#7

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN RECOVERY DATA FORM

LOCATION: B-Stack TEST #: T6-OCA DATE: Nov 20/95 PROJECT NO.: 541-6265

Nozzle, Probe Liner Front Half Filter Holder. All equipment	Filter	Back Half Filter Holder and Condenser Coil All equipment	XAD Resin	Impingers & ~~HPLC~~ Rinse RODI	~~Back Half Rinse~~
Wash and brush 3x each with hexane and acetone. Rinse 3x with with ~~hexane~~ DCM and and acetone.	Remove and place on pre-cleaned foil fold in half and place in ~~petri dish~~. Zip Loc Bag	**Weigh Coil & Record Weight** ~~Soak 5 minutes each with hexane and acetone. Rinse 3x with hexane and acetone.~~ Toluene Proof	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 #4 into container. ~~Rinse 3x with HPLC water.~~	~~Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone.~~

Container ~~TS1~~ TS2 Front Half Acetone ~~Hexane~~ DCM Rinse	
Final Wt.:	530.6
Initial Wt.:	262.2
Gain:	268.4

Container ~~TS2~~ TS1 Filter	
Filter ID:	T6-OCA
Colour:	off white

Container TS3 Back Half Filter and Condenser Coil	
Final Wt.:	510.1
Initial Wt.:	262.6
Gain:	247.5
Colour:	Clear

Container TS4 XAD Resin

Wrap in Foil	
XAD:	046633
Colour:	Off white

Trap 17

Container TS5 Impinger Contents	
Final Wt.:	657.2
Initial Wt.:	262.2
Gain:	395.0
Colour:	Clear

~~Container TS6 Back Half Rinse~~	
Final Wt.:	
Initial Wt.:	
Gain:	
Colour:	

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	01
RODI ~~HPLC~~ Batch No.:	Zcann 95/10/31
Acetone Batch No.:	Caledon 14123
DCM ~~Hexane~~ Batch No.:	Caledon 16700
Filter Batch No.:	Zcann 95/10/24 XAD No.: Trap 17
Train Assembled By:	HVB
Train Recovered By:	RB

Reagent Blanks Collected?	yes
Combined Acetone/~~Hexane~~ DCM	yes
~~Combined Glycol~~/Water	yes
Blank Train Collected?	yes
Comments:	

EPSREC.DRW-May 95

BOVAR-CONCORD Environmental

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO	DATE : 95 11 20
JOBSITE : LAYTON UTAH	RUN : T6-MP-A
REF.No. : 5416265	LOC. : B STACK

RUN TIME : 10:48 TO 13:08

METALS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
METALS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	2.0636 DSm3	72.869 DScf
AVERAGE ISOKINETICITY	105.7 %	

FLUE GAS CHARACTERISTICS

MOISTURE	11.71 %	
TEMPERATURE	208.5 deg C	407.2 deg F
FLOW	46056 DSm3/hr	27108 DScfm
	98611 Am3/hr	58041 Acfm
VELOCITY	19.24 m/s	3788.4 fpm

GAS ANALYSIS	O2	10.30 %
	CO2	9.50 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.05 g/gmole D.B.
	MOL. WT.	28.64 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 20
RUN : T6-MP-A
LOC. : B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.7 kPa	25.60 in.Hg
STATIC PRESSURE	-137.0 Pa	-0.55 in.H2O
NOZZLE DIAMETER	6.20 mm	0.2440 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	130.2 g
CONDENSATION IN IMPINGER 2	47.8 g
CONDENSATION IN IMPINGER 3	7.9 g
CONDENSATION IN IMPINGER 4	1.0 g
CONDENSATION IN IMPINGER 5	0.5 g
CONDENSATION IN IMPINGER 6	0.1 g
SILICA GEL WEIGHT GAIN	13.8 g
TOTAL MOISTURE GAIN	201.3 g

METALS COLLECTION

FILTER METALS	0.0000 mg
WASHINGS METALS	0.0000 mg
IMPINGER METALS	0.0000 mg
TOTAL METALS	0.0000 mg

TOTAL SAMPLING TIME 120.0 min.

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 20
RUN : T6-MP-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	401	0.500	1.10	285.71	74	232	245	41	1.0	1.0	108.3
1	3.0	402	0.600	1.25	287.50	74	239	249	42	1.0	1.0	105.5
2	6.0	387	0.600	1.25	289.41	75	241	249	40	1.0	2.0	104.4
2	9.0	392	0.610	1.30	291.32	75	243	250	40	1.0	2.0	104.9
3	12.0	403	0.850	2.10	293.25	76	241	250	40	1.0	3.0	111.3
3	15.0	407	0.880	2.10	295.65	76	243	251	40	1.0	3.0	108.7
4	18.0	408	0.780	1.70	298.03	77	244	251	42	1.0	4.0	108.4
4	21.0	407	0.760	1.60	300.27	77	244	252	43	1.0	4.0	104.9
5	24.0	407	0.820	1.90	302.41	78	245	252	44	1.0	5.0	106.6
5	27.0	409	0.930	2.00	304.67	79	245	252	44	1.0	5.0	105.8
6	30.0	410	0.650	1.40	307.06	79	245	252	44	1.0	6.0	107.4
6	33.0	411	0.610	1.30	309.09	79	243	248	45	1.0	6.0	106.0
7	36.0	410	0.560	1.10	311.03	79	241	249	45	1.0	7.0	104.1
7	39.0	409	0.530	1.05	312.86	79	241	249	45	1.0	7.0	103.4
8	42.0	410	0.650	1.40	314.63	79	240	248	45	1.0	8.0	105.2
8	45.0	411	0.650	1.40	316.62	79	240	252	45	1.0	8.0	106.8
9	48.0	408	0.700	1.50	318.64	80	241	252	45	1.0	9.0	104.7
9	51.0	407	0.680	1.45	320.70	80	241	247	46	1.0	9.0	107.7
10	54.0	404	0.530	1.05	322.79	80	241	246	46	1.0	10.0	102.4
10	57.0	405	0.610	1.30	324.55	80	242	250	46	1.0	10.0	104.2
	60.0				326.47							
TRAVERSE NO. 2												
1	0.0	412	0.900	1.90	327.89	78	239	241	48	1.0	1.0	106.5
1	3.0	411	0.780	1.70	330.25	80	240	240	46	1.0	1.0	107.6
2	6.0	412	0.830	1.70	332.48	80	241	240	46	1.0	2.0	104.8
2	9.0	411	0.830	1.70	334.72	80	241	240	47	1.0	2.0	103.3
3	12.0	412	0.830	1.75	336.93	81	240	246	48	1.0	3.0	106.1
3	15.0	412	0.830	1.75	339.20	82	242	246	49	1.0	3.0	106.4
4	18.0	411	0.880	1.90	341.48	82	243	239	50	1.0	4.0	105.9
4	21.0	414	1.000	2.10	343.82	83	242	247	49	1.0	4.0	105.9
5	24.0	414	0.950	2.00	346.31	83	243	246	50	1.0	5.0	104.1
5	27.0	411	0.780	1.70	348.70	83	244	249	51	1.0	5.0	106.0
6	30.0	410	0.730	1.60	350.91	84	244	249	52	1.0	6.0	108.3
6	33.0	409	0.800	1.65	353.10	84	246	249	52	1.0	6.0	103.9
7	36.0	410	0.850	1.75	355.30	85	246	250	51	1.0	7.0	104.4

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 20
RUN : T6-MP-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	407	0.700	1.60	357.58	85	245	251	51	1.0	7.0	107.3
8	42.0	404	0.630	1.30	359.71	85	244	250	52	1.0	8.0	103.7
8	45.0	405	0.730	1.60	361.67	85	244	246	52	1.0	8.0	105.4
9	48.0	406	0.780	1.65	363.81	86	243	249	52	1.0	9.0	105.7
9	51.0	406	0.780	1.65	366.03	86	243	249	53	1.0	9.0	104.7
10	54.0	403	0.580	1.10	368.23	86	243	250	53	1.0	10.0	101.8
10	57.0	401	0.550	1.05	370.08	86	243	250	53	1.0	10.0	103.8
	60.0				371.92							
		407	0.725	1.56		80	242	248	47	1.0		105.7

ISOKINETIC TEST DATA FORM

Sample Type: M5 Reference Method: EPA M 29 Page 1 of 5

Client:	Rust & Rust	City, Province:	Layton, Utah
Project Number:	541265	Test Number:	TL-MF-A
Sample Location:	B Stack	Date:	95 11 20
Start Time:	10:48	Finish Time:	13:08
Barometric Press. (in Hg):	25.16" Hg	Stack Press(in H_2O): + or -:	-.55
Stack Diameter (in.):	53	Length x Width:	____ x ____
Stack Height (ft):	116	Cyclonic Flow:	Yes No ✓

Sample Box Number:	T3	Gas Meter Factor:	1.000	Calibration Date:	Sept 95
Nozzle I.D.:	BP AHD	Nozzle Diameter (in.):	.250	Calibration Date:	Nov 95
Probe I.D.:	T1-7	Pitot Coefficient:	.798 .84 AHD	Calibration Date:	Sept 95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): 9.5 0_2 (%): 10.3 CO (ppm): ____ Other: ____

Impinger 1 (g)	130.2	Assumed H_2O (%):	14
Impinger 2 (g)	47.9	Filter I.D. #:	5112A - 102502
Impinger 3 (g)	7.9	Net Filter Wt. (g):	____
Impinger 4 (g)	1.0	Net Probe Wash Wt. (g):	____
Impinger 5 (g)	0.5	Imp. Residue Wt. (g):	____
Impinger 6 (g)	0.1		
~~XAD-2 Trap~~ (g) S.G.	13.8		
Total H_2O Condensed (g)	201.3		

Sampling Comments: _____

Process Rate: _____

Control Equipment Operation: ESP

Process Comments: Normal ~~Temp~~ Temp, high load, NO AC, no Trona

Signature: _____ Date: Nov 20/95

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	KIGOE KIGO
Date:	55.11.20	Test:	TC-MP-A
Sample Location:	STACK B	Filter I.D.:	51124
Pre Weights by:	JA	Post Weights by:	JA

102502

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	BLANK	629.5	499.3	130.2 ✓
2	5% HNO_3 10% H_2O_2	611.9	564.1	47.8 ✓
3	5% HNO_3 10% H_2O_2	623.7	615.5	7.9 ✓
4	BLANK	492.1	491.1	1.0 ✓
5	$KMnO_4$	595.2	594.7	0.5 ✓
6	$KMnO_4$	602.1	602.0	0.1 ✓
7	Silica Gel	809.9	796.1	13.8 ✓
8				
XAD Trap				
			Total (g)	201.3 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	147.5	147.6	✓	JA
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 9K. 11. 20

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BOVAR-CONCORD Environmental

DATE: 95/11/20

SAMPLING TRAINS DATA SHEET

Client: Rigo+Rigo Project #: 5416265 Sample Location: B stack Operators: JW/Jm

Run #: T6-MP-A Traverse #: 1 Traverse Direction: Ø / N Start Time: 10:48 Finish Time: 11:48

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft³)	Gas Meter Reading Actual (ft³)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.5	1.1		285.709	401	232	245	41	NA	76	71	1.0
1	3		0.6	1.25	287.472	287.50	402	239	249	42		76	72	1.0
2	6		0.6	1.25	*289.432	289.41	387	241	249	40		77	73	1.0
2	9		0.61	1.3	291.342	291.32	392	243	250	40		77	73	1.0
3	12		0.85	2.1	*293.268	293.25	403	241	250	40		78	74	1.0
3	15		0.88	2.1	295.55	295.65	407	243	257	40		78	74	1.0
4	18		0.78	1.7	*297.99	298.03	408	244	251	42		79	75	1.0
4	21		0.76	1.6	300.201	300.27	407	244	252	43		79	75	1.0
5	24		0.82	1.9	*302.413	302.41	407	245	251	44		80	75	1.0
5	27		0.93	2.0	304.636	304.67	409	245	252	44		81	76	1.0
6	30		0.65	1.4	*307.041	307.06	410	245	252	44		81	76	1.0
6	33		0.61	1.3	309.042	309.09	411	243	248	45		81	76	1.0
7	36		0.56	1.1	*311.01	311.03	410	241	249	45		81	77	1.0

Pre test leak check: Rate (cfm) .004 at 15 inches Hg (Vacuum) Leak Volume Start: ________ Leak Volume End: ________

Post test leak check: Rate (cfm) .015 at 23 inches Hg (Vacuum) Leak Volume Start: ________ Leak Volume End: ________

K value calculated by: ________ Checked by: ________ Operator Signature: ________

Static = -.55

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BOVAR-CONCORD Environmental

DATE: 95/10/20

SAMPLING TRAINS DATA SHEET

Client: Rio Algom | Project #: 5416265 | Sample Location: B Stack | Operators: JW/JM

Run #: T6-MP-A | Traverse #: 1 | Traverse Direction: 1/X | Start Time: 10:40 | Finish Time: 11:48

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	39		0.53	1.05	312.871	312.86	409	241	245	45	NA	81	77	1.0
8	42		0.65	1.4	*314.651	314.63	410	240	248	45		81	77	1.0
8	45		0.65	1.4	316.612	316.62	411	240	252	45		81	77	1.0
9	48		0.7	1.5	*318.602	318.64	408	241	252	45		82	77	1.0
9	51		0.68	1.45	320.697	320.70	407	241	247	46		82	77	1.0
10	54		0.53	1.05	*322.788	322.79	404	241	246	46		82	78	1.0
10	57		0.61	1.3	324.581	324.55	405	242	250	46		82	78	1.0
10	60				326.470	326.472								

Pre test leak check: Rate (cfm) .009 at 15 inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

Post test leak check: Rate (cfm) .015 at 23 inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

K value calculated by: ______ Checked by: ______

Operator Signature: [signature]

BOVAR-CONCORD Environmental

DATE: 5/11/12

SAMPLING TRAINS DATA SHEET

Client: Duke Energy | Project #: 5416245 | Sample Location: B Stack | Operators: SJ/JM

Run #: 16-MP-1A | Traverse #: 2 | Traverse Direction: OUT | Start Time: 12:00 | Finish Time: 13:00

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		0.90	1.9		327.891	412	239	241	48	NA	79	77	1.0
1	3		0.78	1.7	330.224	330.25	411	240	240	46		82	77	1.0
2	6		0.83	1.7	+332.421	332.48	412	241	240	46		83	77	1.0
2	9		0.83	1.7	334.770	334.72	411	241	240	47		83	77	1.0
3	12		0.83	1.75	+336.992	336.93	412	240	246	48		84	77	1.0
3	15		0.83	1.75	339.202	339.20	412	242	246	49		85	78	1.0
4	18		0.88	1.9	+341.474	341.48	411	243	239	50		85	79	1.0
4	21		1.0	2.1	343.820	343.82	414	242	247	49		86	79	1.0
5	24		0.95	2.0	+346.314	346.31	414	243	246	50		86	80	1.0
5	27		0.78	1.7	348.741	348.70	411	244	249	51		86	80	1.0
6	30		0.73	1.6	+350.903	350.91	410	244	249	52		87	81	1.0
6	33		0.80	1.65	353.041	353.10	409	246	249	52		87	81	1.0
7	36		0.85	1.75	+355.331	355.30	410	246	250	51		87	82	1.0

Pre test leak check: Rate (cfm) .0015 at 23 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .009 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

DATE: 9/11/20 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rio Tinto Project #: 54102405 Sample Location: B Stack Operators: JW/JM

Run #: T6-MP-A Traverse #: 2 Traverse Direction: OUT Start Time: 12:08 Finish Time: 13:08

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
											NA			
7	39		0.70	1.6	357.600	357.58	409	245	251	51		87	82	1.0
8	42		0.63	1.3	*359.667	359.71	404	244	250	52		88	82	1.0
8	45		0.73	1.6	361.69	361.67	405	244	246	52		87	82	1.0
9	48		0.78	1.65	*363.801	363.81	406	243	249	52		88	83	1.0
9	51		0.78	1.65	366.013	366.03	406	243	249	53		88	83	1.0
10	54		0.58	1.1	*368.233	368.23	403	243	250	53		88	83	1.0
10	57		0.55	1.05	370.171	370.08	401	243	250	53		88	83	1.0
ID	60				371.929	371.920								

Pre test leak check: Rate (cfm) .015 at 23 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .009 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: 9/1/20 TEST TO-MP-A

Client: Rio Tinto Location: B Stack Operator: SD

Sample Type: MT Reference Method: EPA M29

Modifications:

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	
Static positive or negative	⟷	neg.
Average Temperature	⟷	
Estimate % H_2O	⟷	14
How estimated?	⟷	MS
Estimate Gas Composition	⟷	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	⟷	COM
Proper nozzle selected?	✓	
K factor	⟷	
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other	✓	Local
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or		
Quartz	✓	
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or		
Quartz or	✓	
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5411626S DATE: 95/120 TEST Te-MP-A

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	+++	
Connected to:	✓	
inclined manometer		
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre		
Quartz	✓	
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	✓	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol		
Thermocouple attached to trap	N/A	
XAD-2 Trap covered with foil at all times		

PROJECT # 5416265 DATE: 95120 TEST T6-MP-A

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	⟷	7
Contents #1	⟷	
#2	⟷	
#3	⟷	
#4	⟷	
#5	⟷	
#6	⟷	
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly		
Modifications	⟷	
Grease used on joints	✓	
Silica gel type	⟷	
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate	⟷	.009 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	N/A	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	Good
Leak checks at port changes Before	⟷	.015 cfm@ 23 "Hg
After	⟷	.015 cfm@ 23 "Hg
Final leak race acceptable	⟷	cfm@ "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	JA
Clean-up area - General Environment	⟷	
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

QA/QC CHECKLIST

PROJECT # 54116205 DATE: 95110 TEST TG-MP-A

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	✓	teflon
Leak free	✓	
Petri Dishes: borosilicate glass		
plastic	✓	
Balance Type	✓	digital bp loader.
Calibrated or QC checked	✓	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		pink/blue
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		
Colour of Filter		
Foil Wrapped?		
Probe Rinses		
Acetone	✓	
Other	✓	NO_3
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents		
Solvents		
Resin		
Blank Train		
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: Stack B TEST #: T6-MP-A DATE: 95.11.20 PROJECT NO.: 5716255

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	**Container TS3 Front Half 0.1 N HNO3 Rinse** Final Wt.: 511.8 Initial Wt.: 262.3 Gain: 249.5 Comments:	Brush loose particulate onto filter	**Container TS4-1 Impinger 4 Contents** Final Wt.: 656.7 Initial Wt.: 262.2 Gain: 394.5	**Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse** Final Wt.: 526.7 Initial Wt.: 262.9 Gain: 263.8 Colour: CLEAR	Rinse with 100 mL 0.1 N HNO3	Rinse 3x with 100 mL Acidified KMnO4	Place rinsing in Container 5C which contains 200 mL of water	
Container TS2 Front Half Acetone Rinse Final Wt.: 342.0 Initial Wt.: 264.5 Gain: 77.5 Comments:		**Filter TS2** Seal petri dish with tape Colour: Filter #: 5112A			**Container TSA Impinger 4 Contents** Final Wt.: 391.7 Initial Wt.: 262.9 Gain: 129.8	Rinse with 100 mL water	**Container 5C HCL Rinse** Final Wt.: 496.1 Initial Wt.: 263.0 Gain: 233.1 Colour: CLEAR	
						Container 5B Impinger 5 & 6 KMnO4 Content and Rinses Final Wt.: 720.8 Initial Wt.: 262.2 Gain: 458.6 Colour: PURPLE		

filter parts in probe wash

Train Identification	Blanks	
Train No.:		
HNO3 / H2O2 Batch No.:	Container 9	200 mLs
DI Water Batch No.:	Container 8B	100 mLs
Acetone Batch No.:	Container 7	100 mLs
0.1 N HNO3 Batch No.:	Container 8A	300 mLs
Acidified KMnO4 Batch No.:	Container 10	100 mLs
8 N HCl / Batch No.: DI Water	Container 11	25 mL / 200 mL
Filter Number:	Container 12	* _____

Mark Liquid Level on Containers ✓
Seal and Label Containers ✓
Reagent Blanks Submitted? Yes ✓ No ____
Prepare Fresh Acidified KMnO4 Daily ✓

M29REC.DRW-May 95

BOVAR-CONCORD Environmental

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	Rigo + Rigo
Date:	Nov 20/95	Test:	T7-OCB
Sample Location:	B Stack	Filter I.D.:	-
Pre Weights by:	HWB	Post Weights by:	HWB

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	MT	603.1	430.0	173.1
2	RODI	618.6	614.8	3.8
3	RODI	603.8	603.7	0.1
4	MT	462.4	461.6	0.8
5	S.G	736.1	718.5	17.6
6				
7				
~~8~~ Condenser only		234.0	233.5	0.5
XAD Trap only		340.3	336.2	4.1
			Total (g)	200.0

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: Train 07 (reused after B1-OC) Trip 19

Signature: HWB

Date: Nov 20/95

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BOVAR-CONCORD Environmental

HWB

DATE: 2/11/95 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: HVB

Run #: I7-0xB Traverse #: 1 Traverse Direction: North Start Time: 2:32 Finish Time: _____

Pt. (For Wall)	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.64	0.85	.565	95.40	410	237	230	61	56	76	75	5
	3		0.64	0.80	.565	97.16	411	244	245	50	43	76	75	5
2	6		0.66	0.9	.573	98.80	412	245	246	49	43	78	76	7
	9		0.60	0.8	.547	100.52	411	247	245	47	40	79	76	6
3	12		0.60	0.85	.547	102.12	411	247	245	45	40	79	76	7
	15		0.55	0.75	.524	103.76	412	246	247	46	40	80	76	6
4	18		0.60	0.85	.547	105.32	413	247	246	46	41	81	76	7
	21		0.60	0.80	.547	106.98	412	247	246	46	40	81	77	7
5	24		0.65	0.85	.569	108.60	412	247	246	47	41	81	77	7
	27		0.75	1.10	.611	110.28	414	247	246	47	41	82	77	8
6	30		0.92	1.7	.677	112.12	415	247	245	47	41	83	77	9
	33		0.92	1.3	.677	114.14	416	247	246	47	41	83	78	9

Pre test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 95.20 Leak Volume End: 95.48

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: HV Ball

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BOVAR-CONCORD Environmental

DATE: 20 / 11 / 95 SAMPLING TRAINS DATA SHEET PAGE 3 OF 5

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: HWB

Run #: T7-OCB Traverse #: 1 Traverse Direction: North Start Time: _____ Finish Time: 3:32

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.80	1.2	.631	116.15	411	246	246	48	41	84	78	9
	39		0.80	1.1	.631	118.06	410	248	245	48	41	84	78	8
8	42		0.78	1.0	.623	119.94	399	248	247	48	41	84	78	7
	45		0.70	1.0	.591	121.78	397	248	248	48	41	84	79	8
9	48		0.60	0.80	.547	123.52	385	248	247	48	41	85	79	7
	51		0.55	0.8	.531	125.16	380	247	245	48	41	85	79	6
10	54		0.55	0.75	.931	126.79	370	246	245	48	41	85	80	6
	57		0.50	0.7	.506	128.38	370	248	247	48	41	85	80	6
	60					129.84								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.015 at 15 inches Hg (Vacuum) Leak Volume Start: 129.84 Leak Volume End: 130.10

K value calculated by: _____ Checked by: _____ Operator Signature: HWB

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BOVAR-CONCORD Environmental

HWB

DATE: 2e / 11 / 95 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: Rego + Rego Project #: 5416265 Sample Location: B Stack Operators: HWB

Run #: T1-CB Traverse #: 2 Traverse Direction: East Start Time: 4:07 Finish Time: _____

Pt. (Near wall)	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.64	0.8	.573	30.38	375	245	246	52	48	82	80	6
	3		0.60	0.85	.555	32.05	380	245	244	48	51	82	80	8
2	6		0.60	0.85	.547	33.68	390	244	245	47	52	83	80	8
	9		0.70	0.95	.591	35.30	387	245	245	47	53	83	80	9
3	12		0.72	0.95	.599	32.05	385	244	245	47	60	83	80	9
	15		0.65	0.85	.576	38.86	381	244	246	47	44	83	80	7
4	18		0.70	0.9	.599	40.57	380	245	246	47	45	83	80	7
	21		0.70	0.95	.599	42.34	377	245	247	47	45	83	80	8
5	24		0.65	0.85	.578	44.14	374	245	241	49	42	83	80	7
	27		0.65	0.90	.578	45.84	372	245	245	48	45	83	80	7
6	30		0.65	0.90	.578	47.52	370	245	245	48	45	83	80	7
	33		0.65	0.90	.578	49.24	367	245	245	48	47	83	80	7

Pre test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 30.10 Leak Volume End: 30.38

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: HWB

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BOVAR-CONCORD Environmental

HWB

DATE: 2/11/95 | SAMPLING TRAINS DATA SHEET | PAGE 5 OF 5

Client: Rego & Rego | Project #: 541645 | Sample Location: B stack | Operators: HWB

Run #: T7-OCB | Traverse #: 2 | Traverse Direction: East | Start Time: _____ | Finish Time: 5:07

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.76	1.1	.625	50.00	366	244	244	47	46	83	80	8
	39		0.82	1.2	.649	52.86	366	244	244	47	47	83	80	8
8	42		0.96	1.5	.702	54.78	369	244	242	47	47	83	80	10
	45		0.96	1.5	.702	56.91	370	245	244	47	47	83	80	10
9	48		0.78	1.2	.633	59.02	368	244	240	47	46	82	79	9
	51		0.70	0.95	.599	60.93	367	245	244	47	46	82	79	8
10	54		0.60	0.85	.555	62.72	366	247	244	47	46	82	79	7
	57		0.63	0.85	.569	64.35	366	245	243	47	47	82	79	7
	60					66.03								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 66.03 Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: HWB

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BOVAR-CONCORD Environmental

PROJECT # 541265 DATE: Nov 20/95 TEST T7-0CB

Client: Rigo + Rigo Location: B Stack Operator: HOB
Layton, UTAH
Sample Type: Organics Reference Method: EPA M23
Modifications: Recovery following Environment Canada with acetone/dcm rinse and toluene proving

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	.06 in H2O
Static positive or negative	⟷	-ve
Average Temperature	⟷	40°F
Estimate % H_2O	⟷	14%
How estimated?	⟷	T1-0CA
Estimate Gas Composition	⟷	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	⟷	T1-CEMA
Proper nozzle selected?	✓	
K factor	⟷	.706 at 40°F
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other	✓	Watch
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	Proving rinse after T6-0CA
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	Proving rinse after T6-0CA
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

HWB

PROJECT # 5416265 DATE: Nov 20/95 TEST T7-OCB

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	---	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type	K	
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	Proving rinse of Train 02 after Bl-OC
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	Proving rinse of Train 02 after Bl-OC
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 5416665 DATE: Nov 20/15 TEST T7-CCB

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	Flowing rinse of Train 02 after B1 CC
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	MT
#2	⟷	RODI
#3	⟷	RODI
#4	⟷	MT
#5	⟷	S.G.
~~#6~~	⟷	
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	⟷	
Grease used on joints	X	
Silica gel type	⟷	
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate	⟷	0.01 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	✓	
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	Good
Leak checks at port changes Before	⟷	0.015 cfm@ 16 "Hg
After	⟷	0.01 cfm@ 15 "Hg
Final leak race acceptable	⟷	0.01 cfm@ 15 "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	RB/JA
Clean-up area - General Environment	⟷	Clean
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 5416L65 DATE: Nov 30/95 TEST T7-dioxB

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	✓	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass		filter in cleaned foil in plastic
plastic		bag
Balance Type	✓	top loader
Calibrated or QC checked	✓	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered		
Silica Gel		
Condition/Colour	✓	25% spent
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		good
Colour of Filter		white
Foil Wrapped?	✓	
Probe Rinses		
Acetone / DCM	✓	
~~Other~~ Toluene	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

#8

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: B - Stack TEST #: T7 - 0CB DATE: Nov 30/95 PROJECT NO.: 5791 - 0265

Nozzle, Probe Liner Front Half Filter Holder	Filter	Back Half Filter Holder and Condenser Coil AN Equipment	XAD Resin	Impingers & ~~HPLC~~ Rinse ROST	Back Half Rinse
Wash and brush 3x each with ~~hexane~~ DCM and acetone. Rinse 3x with ~~hexane~~ and acetone. DCM	Remove and place on pre-cleaned foil fold in half and place in petri dish. Zip Loc Bag	**Weigh Coil & Record Weight** ~~Soak 5 minutes each~~ with ~~hexane and~~ acetone. Rinse ~~3x with~~ hexane and ~~acetone~~. Toluene Proof	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into container. ~~Rinse 3x with HPLC water~~.	Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone.

Container ~~TS1~~ TS2 Front Half Acetone ~~Hexane~~ Rinse DCM	
Final Wt:	538.7
Initial Wt:	262.6
Gain:	276.1

Container ~~TS2~~ TS1 Filter	
Filter ID:	T7-0CB
Colour:	White

Container TS3 Back Half Filter and Condenser Coil	
Final Wt:	471.3
Initial Wt:	262.5
Gain:	208.8
Colour:	Clear

Container TS4 XAD Resin	
Wrap in Foil	
XAD:	046635
Colour:	White

Tray 19

Container TS5 Impinger Contents	
Final Wt:	699.9
Initial Wt:	262.3
Gain:	437.6
Colour:	Clear

Container TS6 Back Half Rinse	
Final Wt.:	
Initial Wt.:	
Gain:	
Colour:	

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	02
~~HPLC~~ Batch No.: (ROST)	Zenon 95/10/26
Acetone Batch No.:	Caledon 14123
~~Hexane~~ Batch No.: (DCM)	Caledon 16700
Filter Batch No.:	Zenon 95/10/11 XAD No.:
Train Assembled By:	MVB
Train Recovered By:	RG

Reagent Blanks Collected?	Yes
Combined Acetone/~~Hexane~~ DCM	Yes
~~Combined Glycol~~/Water	Yes
Blank Train Collected?	Yes
Comments:	

EPSREC.DRW-May 95

BOVAR-CONCORD Environmental

14B

AIR TESTING SERVICES INC. METALS\ EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-20-95
RUN : T7-MP-B
LOC. : B STACK

RUN TIME : 16:04 TO 18:57

METALS\ CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
METALS\ EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	2.1393 DSm3	75.540 DScf
AVERAGE ISOKINETICITY	109.3 %	

FLUE GAS CHARACTERISTICS

MOISTURE	15.33 %	
TEMPERATURE	183.7 deg C	362.7 deg F
FLOW	46164 DSm3/hr	27171 DScfm
	97761 Am3/hr	57540 Acfm
VELOCITY	19.08 m/s	3755.7 fpm

GAS ANALYSIS	O2	10.40 %
	CO2	9.70 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.08 g/gmole D.B.
	MOL. WT.	28.23 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS\ EMISSION REPORT

CLIENT	: RIGO AND RIGO	DATE	: 11-20-95
JOBSITE	: LAYTON UTAH	RUN	: T7-MP-B
REF.No.	: 5416265	LOC.	: B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.7 kPa	25.60 in.Hg
STATIC PRESSURE	-124.5 Pa	-0.50 in.H2O
NOZZLE DIAMETER	6.20 mm	0.2440 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	149.3 g
CONDENSATION IN IMPINGER 2	91.0 g
CONDENSATION IN IMPINGER 3	22.4 g
CONDENSATION IN IMPINGER 4	3.5 g
CONDENSATION IN IMPINGER 5	0.9 g
CONDENSATION IN IMPINGER 6	1.8 g
SILICA GEL WEIGHT GAIN	16.0 g
TOTAL MOISTURE GAIN	284.9 g

METALS\ COLLECTION

FILTER METALS\	0.0000 mg
WASHINGS METALS\	0.0000 mg
IMPINGER METALS\	0.0000 mg
TOTAL METALS\	0.0000 mg

TOTAL SAMPLING TIME 120.0 min.

AIR TESTING SERVICES INC. METALS\ EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-20-95
RUN : T7-MP-B
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	405	0.640	1.40	374.62	79	240	251	53	1.0	1.0	110.1
1	3.0	396	0.640	1.30	376.62	82	240	252	54	1.0	1.0	107.6
2	6.0	364	0.550	1.30	378.60	81	240	252	49	1.0	2.0	109.0
2	9.0	364	0.740	1.75	380.49	82	240	251	48	1.0	2.0	111.9
3	12.0	369	0.850	2.00	382.74	83	242	252	47	1.0	3.0	108.2
3	15.0	370	0.850	2.05	385.07	83	243	251	48	1.0	3.0	111.1
4	18.0	368	0.600	1.40	387.46	83	244	251	50	1.0	4.0	111.4
4	21.0	367	0.630	1.40	389.48	84	244	252	51	1.0	4.0	108.0
5	24.0	366	0.580	1.30	391.49	84	245	250	51	1.0	5.0	107.4
5	27.0	366	0.600	1.35	393.41	84	244	249	52	1.0	5.0	107.8
6	30.0	366	0.650	1.45	395.37	84	244	248	52	1.0	6.0	107.9
6	33.0	365	0.850	1.75	397.41	84	244	249	52	1.0	6.0	104.9
7	36.0	366	0.850	1.90	399.68	84	244	250	52	1.0	7.0	107.3
7	39.0	367	0.700	1.85	402.00	84	244	251	52	1.0	7.0	117.3
8	42.0	365	0.800	1.85	404.30	84	244	251	54	1.0	8.0	109.1
8	45.0	362	0.850	1.90	406.59	84	244	252	54	1.0	8.0	110.3
9	48.0	350	0.550	1.10	408.98	84	244	252	47	1.0	9.0	108.5
9	51.0	348	0.600	1.20	410.89	84	243	252	45	1.0	9.0	103.8
10	54.0	339	0.500	0.95	412.80	84	243	252	43	1.0	10.0	104.2
10	57.0	341	0.500	1.05	414.56	84	243	252	43	1.0	10.0	107.9
	60.0				416.38							
TRAVERSE NO. 2												
1	0.0	362	0.750	1.80	417.11	80	241	253	41	1.0	1.0	112.8
1	3.0	363	0.750	1.75	419.39	82	241	250	39	1.0	1.0	111.5
2	6.0	361	0.760	1.75	421.65	83	243	253	39	1.0	2.0	110.5
2	9.0	363	0.750	1.75	423.91	83	243	247	39	1.0	2.0	111.4
3	12.0	364	0.900	2.20	426.17	83	243	246	38	1.0	3.0	110.3
3	15.0	362	0.750	1.75	428.62	84	244	245	39	1.0	3.0	111.6
4	18.0	365	0.950	2.25	430.89	84	243	245	40	1.0	4.0	110.0
4	21.0	366	0.950	2.25	433.40	84	243	247	40	1.0	4.0	111.7
5	24.0	366	0.950	2.25	435.95	84	244	247	41	1.0	5.0	109.9
5	27.0	361	0.850	2.00	438.46	85	244	247	41	1.0	5.0	111.1
6	30.0	361	0.860	2.00	440.87	85	243	247	41	1.0	6.0	109.1
6	33.0	359	0.820	1.95	443.25	85	244	247	41	1.0	6.0	109.7
7	36.0	359	0.830	1.95	445.59	85	244	246	42	1.0	7.0	108.5

AIR TESTING SERVICES INC. METALS\ EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-20-95
RUN : T7-MP-B
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	358	0.870	2.00	447.92	85	244	246	42	1.0	7.0	108.2
8	42.0	357	0.850	2.00	450.30	85	244	246	42	1.0	8.0	108.5
8	45.0	357	0.800	1.85	452.66	85	244	247	42	1.0	8.0	111.8
9	48.0	355	0.700	1.70	455.02	85	244	248	42	1.0	9.0	107.1
9	51.0	355	0.750	1.75	457.14	85	244	247	42	1.0	9.0	108.8
10	54.0	356	0.780	1.75	459.37	85	244	247	41	1.0	10.0	106.8
10	57.0	353	0.700	1.40	461.60	85	244	247	41	1.0	10.0	107.4
	60.0				463.73							
		363	0.741	1.71		83	243	249	45	1.0		109.3

ISOKINETIC TEST DATA FORM

Sample Type: MS Reference Method: EPA M29 Page 1 of 5

Client:	Rio Tinto	City, Province:	Layton, Utah
Project Number:	54162665	Test Number:	T7-MPB-
Sample Location:	B Stack	Date:	95 11 20
Start Time:	16:04	Finish Time:	18:57
Barometric Press. (in Hg):	25.60	Stack Press(in H_2O): + or -:	-0.5
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes No

Sample Box Number:	T3	Gas Meter Factor:	1.006	Calibration Date:	Sept 95
Nozzle I.D.:	Q1	Nozzle Diameter (in.):	.246	Calibration Date:	Nov 95
Probe I.D.:	T1-7	Pitot Coefficient:	.788 HMB	Calibration Date:	Sept 95

Equipment Comments: Probe Started.

STACK GAS COMPOSITION

CO_2 (%): ____ 0_2 (%): ____ CO (ppm): ____ Other: ____

Impinger 1 (g)	149.3	Assumed H_2O (%):	14
Impinger 2 (g)	91.0	Filter I.D. #:	5113-A / 102503
Impinger 3 (g)	22.4	Net Filter Wt. (g):	
Impinger 4 (g)	3.5	Net Probe Wash Wt. (g):	
Impinger 5 (g)	0.9	Imp. Residue Wt. (g):	
Impinger 6 (g)	1.8		
XAD-2 Trap (g)	16.0		
Total H_2O Condensed (g)	284.9		

Sampling Comments: - probe short circuit, stopped sampling at 3min (1st traverse)
- leak check volume = 1.324 ft^3, probe fixed, testing continued

Process Rate: ____

Control Equipment Operation: ESP

Process Comments: Normal Temp, high load, NO AC, NO Thermic

Signature: ____ Date: 95/11/20

MOISTURE ANALYSIS DATA SHEET

Project #:	5416765	Client:	RIGO & RIGO
Date:	95.11.20	Test:	T7-MF-B
Sample Location:	Stack B	Filter I.D.:	5113-A 102503
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	617.8	469.5	148.3 ✓
2	5% HNO_3 \ 10% H_2O_2	674.1	583.1	91 ✓
3	5% HNO_3 / 10% H_2O_2	628.7	606.3	22.4 ✓
4	Blank	496.4	492.9	3.5 ✓
5	$KMnO_4$	601.6	600.7	0.9 ✓
6	$KMnO_4$	582.6	580.8	1.8 ✓
7	SG	763.3	767.3	16.0
8				
XAD Trap				
			Total (g)	284.9 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights	147.5	147.6	✓	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.21

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BOVAR-CONCORD Environmental

DATE: 95/11/20

SAMPLING TRAINS DATA SHEET

Client: Dipottily Project #: 5411265 Sample Location: B Stack Operators: JW/JM

Run #: T4-M1-B Traverse #: 1 Traverse Direction: ~~E~~ EXIT Start Time: 16:04 Finish Time: 17:37

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft³)	Gas Meter Reading Actual (ft³)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.64	1.4	374.621 376.624	~~373.297~~	405	240	251	53	NA	80	78	1.0
1	3		0.64	1.3	375.264	~~375.30~~	396	240	252	54		84	79	1.0
* 2	6		.55	1.3	volume after leak check *376.624	378.60	364	240	252	49		83	79	1.0
2	9		0.74	1.75	380.507	380.49	364	240	251	48		84	79	1.0
3	12		0.85	2.0	*382.701	382.74	369	242	252	47		86	80	1.0
3	15		0.85	2.05	385.109	385.07	370	243	257	48		86	80	1.0
4	18		0.6	1.4	*387.404	387.46	368	244	257	50		86	80	1.0
4	21		0.63	1.4	389.421	389.48	367	244	252	57		86	81	1.0
5	24		0.58	1.3	*391.489	391.49	366	245	250	57		86	81	1.0
5	27		0.6	1.35	393.418	393.41	366	244	249	52		86	81	1.0
6	30		0.65	1.45	*395.377	395.37	366	244	248	52		86	81	1.0
6	33		0.85	1.75	397.411	397.41	365	244	249	52		86	82	1.0
7	36		0.85	1.9	*399.744	399.68	366	244	250	52		86	82	1.0

Pre test leak check: Rate (cfm) .006 at 16 inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

Post test leak check: Rate (cfm) .007 at 23 inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

K value calculated by: ______ Checked by: ______ Operator Signature: ______

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16:08 - probe short circuit, stopped sampling to repair.
~~16:10~~ - stopped pump after 3 mins. - leaked checked and resumed: (16:40)
- volume after leak check = 376.624

376.624
− 375.30
leak check volume = 1.324

BOVAR-CONCORD Environmental

DATE: 95 / 11 / 20

SAMPLING TRAINS DATA SHEET

Client: Rizotkyo Project #: 5416265 Sample Location: B Stack Operators: JW/JW

Run #: T7-MP-B Traverse #: 1 Traverse Direction: EAST Start Time: 16:04 Finish Time: 17:37

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
											NA			
7	39		0.70	1.85	402.014	402.00	367	244	251	52		86	82	1.0
8	42		0.8	1.85	*404.236	404.30	365	244	252	54		86	82	1.0
8	45		0.85	1.9	406.564	406.59	362	244	252	54		86	82	1.0
9	48		0.55	1.2	*408.924	408.98	350	244	252	47		86	82	1.0
9	51		0.60	1.2	410.887	410.89	348	243	252	45		86	82	1.0
10	54		0.50	0.95	*412.881	412.80	339	243	252	43		85	82	1.0
10	57		0.50	1.05	414.618	414.56	341	243	252	43		85	82	1.0
10	60				416.378	416.376								

Pre test leak check: Rate (cfm) .006 at 16 inches Hg (Vacuum) Leak Volume Start: ________ Leak Volume End: ________

Post test leak check: Rate (cfm) .007 at 23 inches Hg (Vacuum) Leak Volume Start: ________ Leak Volume End: ________

K value calculated by: ________ Checked by: ________ Operator Signature: [signature]

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BOVAR-CONCORD Environmental

DATE: 5/11/92

SAMPLING TRAINS DATA SHEET

Client: Rigot Algo Project #: 5410261 Sample Location: B Stack Operators: JW/JM

Run #: T7-MP-B Traverse #: 2 Traverse Direction: OUT Start Time: 17:57 Finish Time: 18:57

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft³)	Gas Meter Reading Actual (ft³)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.75	1.8		417.105	362	241	253	41	NA	80	80	1.0
1	3		0.75	1.75	419.331	419.39	363	241	250	39		84	80	1.0
2	6		0.76	1.75	*421.616	421.65	361	243	253	39		85	80	1.0
2	9		0.75	1.75	423.891	423.91	363	243	247	39		85	80	1.0
3	12		0.9	2.2	*426.136	426.17	364	243	246	38		86	80	1.0
3	15		0.75	1.75	428.608	428.62	362	244	245	39		86	81	1.0
4	18		0.95	2.25	*430.86	430.89	365	243	245	40		86	81	1.0
4	21		0.95	2.25	433.365	433.40	366	243	247	40		87	81	1.0
5	24		0.95	2.25	*435.905	435.95	366	244	247	41		87	81	1.0
5	27		0.85	2.0	438.455	438.460	361	244	247	41		87	82	1.0
6	30		0.86	2.0	*440.829	440.87	361	243	247	41		87	82	1.0
6	33		0.82	1.95	443.253	443.25	359	244	247	41		87	82	1.0
7	30		0.83	1.95	*445.577	445.59	359	244	246	42		87	82	1.0

Pre test leak check: Rate (cfm) .007 at 15 inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

Post test leak check: Rate (cfm) .0015 at 22 inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

K value calculated by: ______ Checked by: ______ Operator Signature: [signature]

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BOVAR-CONCORD Environmental

NB

DATE: 95/11/20

SAMPLING TRAINS DATA SHEET

Client: Kyo + Kyo   Project #: 5416265   Sample Location: B Stack   Operators: JW/Jim

Run #: T7MPB   Traverse #: 2   Traverse Direction: Out   Start Time: 17:57   Finish Time: 18:57

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
											N/A			
7	39		0.87	2.0	447.931	447.92	358	244	246	42		87	82	1.0
8	42		0.85	2.0	*450.317	450.30	357	244	246	42		87	82	1.0
8	45		0.80	1.85	452.669	452.66	357	244	247	42		87	82	1.0
9	48		0.70	1.7	*454.959	455.02	355	244	248	42		87	83	1.0
9	51		0.75	1.75	457.170	457.14	355	244	247	42		87	83	1.0
10	54		0.78	1.75	*459.366	459.37	356	244	247	41		87	83	1.0
10	57		0.70	1.4	461.64	461.60	353	244	247	41		87	83	1.0
10	60				463.75	463.732								

Pre test leak check: Rate (cfm) .007 at 15 inches Hg (Vacuum)   Leak Volume Start: ________   Leak Volume End: ________

Post test leak check: Rate (cfm) 0.015 at 22 inches Hg (Vacuum)   Leak Volume Start: ________   Leak Volume End: ________

K value calculated by: ________   Checked by: ________   Operator Signature: [signature]

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BOVAR-CONCORD Environmental

[initials]

PROJECT # 5416265 DATE: 951120 TEST T7-MP-B

Client: Ryan Rigo Location: B Stack Operator: JW

Sample Type: MS Reference Method: EPA M29

Modifications:

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	
Static positive or negative	⟷	MS
Average Temperature	⟷	
Estimate % H_2O	⟷	14
How estimated?	⟷	MS
Estimate Gas Composition	⟷	O_2% 15 CO_2(%) 15 CO(ppm) ___
How Estimated?	⟷	previous tests
Proper nozzle selected?	✓	
K factor	⟷	
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?	✓	
Mercury		
Aneroid		
Other	✓	watch
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or		
Quartz	✓	
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or		
Quartz or	✓	
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

HMB

PROJECT # 54162605 DATE: 95 11 20 TEST T7-MP-5

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	+++	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre		
Quartz	✓	
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	✓	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol		
Thermocouple attached to trap	N/A	
XAD-2 Trap covered with foil at all times		

PROJECT # 5416265 DATE: 5/7/20 TEST 17-MM-5

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	⟷	7
Contents #1	⟷	Blank
#2	⟷	Nitric
#3	⟷	Nitric
#4	⟷	Blank
#5	⟷	Permangenate
#6	⟷	Permangenate
Impinger weights recorded	✓	S.G.
Impingers properly assembled	✓	
Recirculating pump set up properly		N/A
Modifications	⟷	
Grease used on joints	✓	
Silica gel type	⟷	
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate	⟷	.0006 cfm@ 16 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	N/A	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	good
Leak checks at port changes Before	⟷	.007 cfm@ 23 "Hg
After	⟷	.007 cfm@ 5 "Hg
Final leak race acceptable	⟷	.015 cfm@ 22 "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	JA
Clean-up area - General Environment	⟷	
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

QA/QC CHECKLIST

PROJECT # 5416265 DATE: 95120 TEST T7-MP-B

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	↔	teflon
Leak free	✓	
Petri Dishes: borosilicate glass		
plastic	✓	
Balance Type	↔	digital top loader.
Calibrated or QC checked	↔	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		pink-blue.
Condition/Colour		
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		
Colour of Filter		
Foil Wrapped?		
Probe Rinses	✓	
Acetone	✓	
Other		MEK's
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents		
Solvents		
Resin		
Blank Train		
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

TAB

Δp = 25.52 mHg

METHOD 26
HCl SAMPLING DATA FORM

Rig = Rig Time on = 14:34

Company Name	DAVIS COUNTY	Plant Location	LAYTON, UTAH	Source Name	STACK B
Test Date	NOV 20/95	Test Number	TR-HCl-B	Job Number	5416265
Sampling for	HCl	Meter Box	V1	B.P. mm/inHg	864 mbar (25.5 inHg)

ABSORBING SOL'N	15 ml 0.1 N H_2SO_4	15 ml 0.1 N H_2SO_4	15 ml 0.1 N NaOH	15 ml 0.1 N NaOH	Silica Gel	GAS	1	2	3	4
WEIGHTS	IMP 1	IMP 2	IMP 3	IMP 4	IMP 5	READINGS				
EMPTY						O2				
FILLED FINAL						C02				
FILLED INITIAL						CO				
DIFFERENCE						TIME				

OPERATOR	RM	Sample Rate (Lpm)	~2	H20 Condensed	
Lk.Chk, (Init.)	0 cc/min	Lk. Chk. (Final)	0 cc/min	Probe Purged	(Yes) No

Sample Time	Clock Time	Volume, m³ Desired	Volume, m³ Actual	Vacuum in.Hg	Meter Temp. °C/°F	Probe Temp. °C/°F	Box Temp. °C/°F	Impinger Temp. °C/°F
0	0		758.5	1	75	241	226	
10	5		768.6	1	75.5	294	224	
20	10		758.7	1	75.5	236	230	
30	15		768.85	1	75.5	307	240	
40	20		779.8	1	75	240	248	
50	25		789.1	1	74	314	251	
60	30		799.25	1	75.5	243	250	
70	35		809.35	1	78	307	248	
80	40		819.5	1	78.5	242	247	
90	45		829.6	1	76.5	325	245	
100	50		839.7	1	73	238	244	
110	55		850.0	1	73	270	242	
120	60		860.1	1	73	256	242	
		AVG/TOT	121.6	1	75.2	270	241	

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4.294 ft³

Time off 15:34

BOVAR-CONCORD Environmental

MOISTURE ANALYSIS DATA SHEET

Project #:	54/6265	Client:	King & King
Date:	95.11.20	Test:	23-HCl-B
Sample Location:	Stack B	Filter I.D.:	—
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	91.3	86.0	5.3 ✓
2	0.1N H_2SO_4	99.5	95.3	4.2 ✓
3	0.1N H_2SO_4	105.7	105.5	0.2 ✓
4	Blank	71.2	71	0.2 ✓
5	0.1N NaOH	95.1	95.0	0.1 ✓
6	0.1N NaOH	97.8	97.7	0.1 ✓
7	S.G	120.7	119.9	0.8 ✓
8				
XAD Trap				
			Total (g)	10.9 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights	147.5	147.6	—	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.20

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BOVAR-CONCORD Environmental

HCl METHOD 26 SAMPLING TRAIN
RECOVERY DATA FORM

PROJECT NO.: 97-1626-5

LOCATION: B Stack TEST #: 18-HCl-B DATE: 95-11-20

Impingers 1 and 2	Impingers 3 and 4
Weigh impingers Empty contents into container and rinse with DI water	Weigh impingers Empty contents into container and rinse with DI water

Container TS1 Impingers 1 and 2 0.1 N H2SO4 Contents and DI Water Rinses	
Final Wt.:	134.0
Initial Wt.:	34.0
Gain:	100.0

Container TS2 Impingers 3 and 4 0.1 N NaOH Contents and DI Water Rinses	
Final Wt.:	137.9
Initial Wt.:	33.5
Gain:	104.4

Mark Liquid Level	Seal and Label

Train Identification
Train No.:
0.1 N H2SO4 Batch No.:
DI Water Batch No.:
0.1 N NaOH Batch No.:
Train Loaded By: JA
Recovered By: JA
Reagent Blank Submitted: Yes _____ No _____

BOVAR-CONCORD Environmental

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-20-95
RUN : T7-OC-B
LOC. : B STACK

RUN TIME : 14:32 TO 17:07

ORGANICS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
ORGANICS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	1.6544 DSm3	58.417 DScf
AVERAGE ISOKINETICITY	101.6 %	

FLUE GAS CHARACTERISTICS

MOISTURE	14.11 %	
TEMPERATURE	198.2 deg C	388.7 deg F
FLOW	43987 DSm3/hr	25890 DScfm
	95097 Am3/hr	55972 Acfm
VELOCITY	18.56 m/s	3653.4 fpm

GAS ANALYSIS	O2	10.40 %
	CO2	9.70 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.08 g/gmole D.B.
	MOL. WT.	28.38 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-20-95
RUN : T7-OC-B
LOC. : B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.4 kPa	25.50 in.Hg
STATIC PRESSURE	-114.5 Pa	-0.46 in.H2O
NOZZLE DIAMETER	5.79 mm	0.2280 in.
PITOT COEFFICIENT	0.796	
METER CORRECTION FACTOR	0.983	

CONDENSATE COLLECTION

RESIN TRAP CONDENSATE	4.6 g
CONDENSATION IN IMPINGER 1	173.1 g
CONDENSATION IN IMPINGER 2	3.8 g
CONDENSATION IN IMPINGER 3	0.1 g
CONDENSATION IN IMPINGER 4	0.8 g
SILICA GEL WEIGHT GAIN	17.6 g
TOTAL MOISTURE GAIN	200.0 g

ORGANICS COLLECTION

FILTER ORGANICS	0.0000 mg
WASHINGS ORGANICS	0.0000 mg
RESIN ORGANICS	0.0000 mg
IMPINGER ORGANICS	0.0000 mg
TOTAL ORGANICS	0.0000 mg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-20-95
RUN : T7-OC-B
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.
TRAVERSE NO. 1												
1	0.0	410	0.640	0.85	95.48	76	237	230	56	61	5.0	1.0
1	3.0	411	0.640	0.80	97.16	76	244	245	43	50	5.0	1.0
2	6.0	412	0.660	0.90	98.80	77	245	246	43	49	7.0	2.0
2	9.0	411	0.600	0.80	100.52	78	247	245	40	47	6.0	2.0
3	12.0	411	0.600	0.85	102.12	78	247	245	40	45	7.0	3.0
3	15.0	412	0.550	0.75	103.76	78	246	247	40	46	6.0	3.0
4	18.0	413	0.600	0.85	105.32	79	247	246	41	46	7.0	4.0
4	21.0	412	0.600	0.80	106.98	79	247	246	40	46	7.0	4.0
5	24.0	412	0.650	0.85	108.60	79	247	246	41	47	7.0	5.0
5	27.0	414	0.750	1.10	110.28	80	247	246	41	47	8.0	5.0
6	30.0	415	0.920	1.30	112.12	80	247	245	41	47	9.0	6.0
6	33.0	416	0.920	1.30	114.14	81	247	246	41	47	9.0	6.0
7	36.0	411	0.800	1.20	116.15	81	246	246	41	48	9.0	7.0
7	39.0	410	0.800	1.10	118.06	81	248	245	41	48	8.0	7.0
8	42.0	399	0.780	1.00	119.94	81	248	247	41	48	7.0	8.0
8	45.0	397	0.700	1.00	121.78	82	248	248	41	48	8.0	8.0
9	48.0	385	0.600	0.90	123.52	82	248	247	41	48	7.0	9.0
9	51.0	380	0.550	0.80	125.16	82	247	245	41	48	6.0	9.0
10	54.0	370	0.550	0.75	126.79	83	246	245	41	48	6.0	10.0
10	57.0	370	0.500	0.70	128.38	83	248	247	41	48	6.0	10.0
	60.0				129.84							
TRAVERSE NO. 2												
1	0.0	375	0.640	0.80	30.38	81	245	246	48	52	6.0	1.0
1	3.0	380	0.600	0.85	32.05	81	245	244	51	48	8.0	1.0
2	6.0	390	0.600	0.85	33.68	82	244	245	52	47	8.0	2.0
2	9.0	387	0.700	0.95	35.30	82	245	245	53	47	9.0	2.0
3	12.0	385	0.720	0.95	37.05	82	244	245	60	47	9.0	3.0
3	15.0	381	0.650	0.85	38.86	82	244	246	44	47	7.0	3.0
4	18.0	380	0.700	0.90	40.57	82	245	246	45	47	7.0	4.0
4	21.0	377	0.700	0.95	42.34	82	245	247	45	47	8.0	4.0
5	24.0	374	0.650	0.85	44.14	82	245	241	42	49	7.0	5.0
5	27.0	372	0.650	0.90	45.84	82	245	245	45	48	7.0	5.0
6	30.0	370	0.650	0.90	47.52	82	245	245	45	48	7.0	6.0
6	33.0	367	0.650	0.90	49.24	82	245	245	47	48	7.0	6.0
7	36.0	366	0.760	0.76	51.00	82	244	244	46	47	8.0	7.0

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-20-95
RUN : T7-OC-B
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST in.
7	39.0	366	0.820	0.82	52.86	82	244	244	47	47	8.0	7.0
8	42.0	369	0.960	0.96	54.78	82	244	242	47	47	10.0	8.0
8	45.0	370	0.960	0.96	56.91	82	245	244	47	47	10.0	8.0
9	48.0	368	0.780	0.78	59.02	82	244	240	46	47	8.0	9.0
9	51.0	367	0.700	0.70	60.93	82	245	244	46	47	7.0	9.0
10	54.0	366	0.600	0.60	62.72	82	245	244	46	47	7.0	10.0
10	57.0	366	0.630	0.63	64.35	82	245	243	47	47	7.0	10.0
	60.0				66.03							
		389	0.684	0.89		81	246	245	45	48	7.4	

ISOKINETIC TEST DATA FORM

Sample Type: Organics Reference Method: EPA M23 Page 1 of 5

Client:	Rigo + Rigo	City, Province:	Layton, UTAH
Project Number:	5416265	Test Number:	TI-OCB
Sample Location:	B Stack	Date:	Nov 20/95
Start Time:	2:32 pm	Finish Time:	5:07 pm
Barometric Press. (in Hg):	25.5	Stack Press(in H_2O): + or -:	-0.46
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes (No)

Sample Box Number:	TI	Gas Meter Factor:	.983	Calibration Date:	Sept 19/95
Nozzle I.D.:	TI-2	Nozzle Diameter (in.):	.228	Calibration Date:	Nov 16/95
Probe I.D.:	T2-7	Pitot Coefficient:	0.796	Calibration Date:	Sept/95

Equipment Comments: —

STACK GAS COMPOSITION

CO_2 (%): ____ 0_2 (%): ____ CO (ppm): ____ Other: ____

Impinger 1 (g)	173.1	Assumed H_2O (%):	14
Impinger 2 (g)	3.6	Filter I.D. #:	—
Impinger 3 (g)	0.1	Net Filter Wt. (g):	—
Impinger 4 (g)	0.6	Net Probe Wash Wt. (g):	—
Impinger 5 (g) S.G	17.6	Imp. Residue Wt. (g):	—
~~Impinger 6 (g)~~ Condenser	0.5		
XAD-2 Trap (g)	4.1		
Total H_2O Condensed (g)	200.0		

Sampling Comments: Train 02 (reused after BI-OC) Trap 19

Process Rate: —

Control Equipment Operation: Rigo + Rigo started adding cooling water at ≈ 4:00 pm at a rate of ≈ 3 gallons per minute. The stack

Process Comments: temperature dropped steadily from ≈ 400°F to ≈ 365°F

Signature: [signature] Date: Nov 20/95

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: STACK B TEST #: T7-MP-B DATE: 95-11-20 PROJECT NO.: 5716265

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	**Container TS3 Front Half 0.1 N HNO3 Rinse** Final Wt.: 438.8 Initial Wt.: 262.7 Gain: 176.1 Comments:	Brush loose particulate onto filter	**Container TS4-1 Impinger 4 Contents** Final Wt.: 731.9 Initial Wt.: 262.2 Gain: 469.2	**Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse** Final Wt.: 512.4 Initial Wt.: 262.6 Gain: 249.8 Colour:	Rinse with 100 mL 0.1 N HNO3	Rinse 3x with 100 mL Acidified KMnO4	Place rinsing in Container 5C which contains 200 mL of water	
Container TS2 Front Half Acetone Rinse Final Wt.: 346.0 Initial Wt.: 262.9 Gain: 83.1 Comments:		**Filter TS2** Seal petri dish with tape Colour: Filter #: 5713A			**Container TSA Impinger 4 Contents** Final Wt.: 365.1 Initial Wt.: 262.1 Gain: 3.0	Rinse with 100 mL water	**Container 5C HCL Rinse** Final Wt.: 491.5 Initial Wt.: 266.6 Gain: 224.9 Colour:	
						Container 5B Impinger 5 & 6 KMnO4 Content and Rinses Final Wt.: 721.7 Initial Wt.: 265.4 Gain: 456.3 Colour:		

part of filter maybe in probe wash

Train Identification	Blanks	
Train No.:		
HNO3 / H2O2 Batch No.:	Container 9	200 mLs
DI Water Batch No.:	Container 8B	100 mLs
Acetone Batch No.:	Container 7	100 mLs
0.1 N HNO3 Batch No.:	Container 8A	300 mLs
Acidified KMnO4 Batch No.:	Container 10	100 mLs
8 N HCl / Batch No.: DI Water	Container 11	25 mL / 200 mL
Filter Number:	Container 12	* _____

Mark Liquid Level on Containers
Seal and Label Containers
Reagent Blanks Submitted? Yes ____ No ____
Prepare Fresh Acidified KMnO4 Daily ✓

MSPREC.DRW-May 95

BOVAR-CONCORD Environmental

AH3

NOVEMBER 21, 1995

TIME ON 9:10

METHOD 26
HCl SAMPLING DATA FORM

Bp = 25.08 in Hg

Company Name	[illegible]	Plant Location	LAYTON UTAH	Source Name	STACK B
Test Date	NOV 21/95	Test Number	T-2-HCl-A	Job Number	5416205
Sampling for	HCl	Meter Box	V1 Y:1.001	B.P. mm/inHg	849 mb

ABSORBING SOL'N	15 ml 0.1 N H_2SO_4	15 ml 0.1 N H_2SO_4	15 ml 0.1 N NaOH	15 ml 0.1 N NaOH	Silica Gel	GAS	1	2	3	4
WEIGHTS	IMP 1	IMP 2	IMP 3	IMP 4	IMP 5	READINGS				
EMPTY						O2				
FILLED FINAL						C02				
FILLED INITIAL						CO				
DIFFERENCE						TIME				

OPERATOR	JM	Sample Rate (Lpm)	~2	H20 Condensed	
Lk.Chk. (Init.)	.04 cc/min @ 19 in Hg	Lk. Chk. (Final)	.08 cc/min @ 19 in Hg	Probe Purged	(Yes / No)

Sample Time	Clock Time	Volume m^3 Desired	Volume m^3 Actual	Vacuum in.Hg	Meter Temp. °C/°F	Probe Temp. °C/°F	Box Temp. °C/°F	Impinger Temp. °C/°F
0	0		876.7	1	40	317	215	
10	5		887.4	1	41.5	335	215	
20	10		897.35	1	41.5	281	293	
30	15		907.45	1	44	317	312	
40	20		917.45	1	45.5	243	261	
50	25		927.5	1	45	281	228	
60	30		937.7	1	46	248	227	
70	35		947.75	1	46.5	298	226	
80	40		957.95	1	46.5	313	250	
90	45		968.15	1	47	243	274	
100	50		978.25	1	48	294	290	
110	55		988.4	1	51.5	223	312	
120	60		998.55					
		TOT/AVG	121.85	1	45.25	273	258	

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4.302 ft³

TIME OFF 10:10

BOVAR-CONCORD Environmental

JM

MOISTURE ANALYSIS DATA SHEET

Project #:	5716265	Client:	R & R
Date:	95.11.20	Test:	TGHR - A
Sample Location:	Stack B	Filter I.D.:	—
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	88.5	86.0	2.5
2	0.1N H2SO4	105.8	94.6	11.3
3	0.1N H2SO4	106.6	106.3	0.3
4	Blank	71.1	71.1	0
5	0.1N NaOH	99.3	99.2	0.1
6	0.1N NaOH	97.4	97.3	0.1
7	SG.	121.7	120.7	1.0
8				
XAD Trap				
			Total (g)	15.3

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights	147.5	147.6	—	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.21

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BOVAR-CONCORD Environmental

HCl METHOD 26 SAMPLING TRAIN
RECOVERY DATA FORM

PROJECT NO.: 5416265

LOCATION: STACK B TEST #: TQ-H02A DATE: 95.11.21

Impingers 1 and 2
Weigh impingers Empty contents into container and rinse with DI water

Impingers 3 and 4
Weigh impingers Empty contents into container and rinse with DI water

Container TS1 Impingers 1 and 2 0.1 N H2SO4 Contents and DI Water Rinses	
Final Wt.:	100.0
Initial Wt.:	0
Gain:	100.0

Container TS2 Impingers 3 and 4 0.1 N NaOH Contents and DI Water Rinses	
Final Wt.:	100.0
Initial Wt.:	0
Gain:	100.0

Mark Liquid Level

Seal and Label

Train Identification
Train No.:
0.1 N H2SO4 Batch No.:
DI Water Batch No.:
0.1 N NaOH Batch No.:
Train Loaded By: JH
Recovered By: JH
Reagent Blank Submitted: Yes ✓ No ____

BOVAR-CONCORD Environmental

1 of 2

SYSTEM CALIBRATION AND DRIFT CALCULATIONS

CLIENT	RIGO+RIGO	DATE	NOV21/95
PROJECT NUMBER	5416265	TIME START	09:00
SAMPLE LOCATION	STACK	TIME FINISH	13:27
	TEST NUMBER	T8CEMA	

INSTRUMENT SPAN VALUES

OXYGEN	25	%	CARBON DIOXIDE	20	%
SULPHUR DIOXIDE	1000	PPM	CARBON MONOXIDE	1000	PPM
NITROGEN OXIDES	1000	PPM	TOTAL HYDROCARBO	100	PPM

			INITIAL VALUES		FINAL VALUES		
ITEM	CAL.GAS VALUE	ANAL. CAL.	SYSTEM CAL.	SYSTEM CAL. BIAS (% SPAN)	SYSTEM CAL.	SYSTEM CAL. BIAS (% SPAN)	DRIFT (% SPAN)
O2 ZERO	0	0.03	0.03	0.0	0.17	0.6	0.6
O2 CAL	9.91	9.91	9.83	-0.3	10.5	2.4	2.7
SO2 ZERO	0	-0.3	5.3	0.6	0.5	0.1	-0.5
SO2 SPAN	149	149	137	-1.2	134	-1.5	-0.3
NOX ZERO	0	0.95	2.4	0.1	1.4	0.0	-0.1
NOX SPAN	302	302	301	-0.1	303	0.1	0.2
CO2 ZERO	0	0.07	0.07	0.0	0.12	0.3	0.3
CO2 SPAN	7.01	7.02	6.98	-0.2	7.03	0.1	0.3
CO ZERO	0	1.2	1.1	-0.0	-0.04	-0.1	-0.1
CO SPAN	100	102	102	0.0	99	-0.3	-0.3
THC ZERO	0	0.8	0.9	0.1	3	2.2	2.1
THC SPAN	20.1	21.8	21.5	-0.3	19.95	-1.8	-1.5

DRIFT CRITERIA <5% SPAN
BIAS CRITERIA <5% SPAN

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-21-95
RUN : T8-OC-A
LOC. : B STACK

RUN TIME : 8:45 TO 11:30

ORGANICS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
ORGANICS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	1.6065 DSm3	56.727 DScf
AVERAGE ISOKINETICITY	106.0 %	

FLUE GAS CHARACTERISTICS

MOISTURE	16.42 %	
TEMPERATURE	170.3 deg C	338.5 deg F
FLOW	40961 DSm3/hr	24109 DScfm
	85960 Am3/hr	50594 Acfm
VELOCITY	16.78 m/s	3302.3 fpm

GAS ANALYSIS	O2	10.18 %
	CO2	10.00 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.12 g/gmole D.B.
	MOL. WT.	28.13 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-21-95
RUN : T8-OC-A
LOC. : B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.0 kPa	25.40 in.Hg
STATIC PRESSURE	-129.5 Pa	-0.52 in.H2O
NOZZLE DIAMETER	5.79 mm	0.2280 in.
PITOT COEFFICIENT	0.796	
METER CORRECTION FACTOR	0.983	

CONDENSATE COLLECTION

RESIN TRAP CONDENSATE	3.4 g
CONDENSATION IN IMPINGER 1	208.3 g
CONDENSATION IN IMPINGER 2	6.6 g
CONDENSATION IN IMPINGER 3	1.4 g
CONDENSATION IN IMPINGER 4	1.5 g
SILICA GEL WEIGHT GAIN	10.9 g
TOTAL MOISTURE GAIN	232.1 g

ORGANICS COLLECTION

FILTER ORGANICS	0.0000 mg
WASHINGS ORGANICS	0.0000 mg
RESIN ORGANICS	0.0000 mg
IMPINGER ORGANICS	0.0000 mg
TOTAL ORGANICS	0.0000 mg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-21-95
RUN : T8-OC-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1													
1	0.0	340	0.570	0.90	89.78	59	241	252	42	38	4.0	1.0	111.1
1	3.0	339	0.470	0.85	91.47	61	240	249	48	38	4.5	1.0	110.1
2	6.0	336	0.400	0.70	93.00	61	240	243	47	38	4.5	2.0	112.9
2	9.0	335	0.450	0.72	94.45	62	242	246	50	39	4.5	2.0	109.9
3	12.0	336	0.450	0.69	95.95	62	242	242	49	39	4.5	3.0	104.1
3	15.0	340	0.570	0.90	97.37	62	241	242	50	39	5.0	3.0	100.6
4	18.0	336	0.550	0.92	98.91	62	241	237	51	40	5.5	4.0	116.7
4	21.0	338	0.600	0.97	100.67	63	242	237	52	40	5.5	4.0	108.5
5	24.0	338	0.600	0.94	102.38	63	243	242	53	41	5.5	5.0	112.3
5	27.0	336	0.450	0.63	104.15	65	243	240	55	42	4.5	5.0	102.8
6	30.0	343	0.700	1.10	105.56	65	243	232	50	42	5.5	6.0	105.8
6	33.0	341	0.700	1.10	107.36	65	242	233	48	42	5.0	6.0	105.1
7	36.0	338	0.600	0.93	109.15	68	243	233	48	43	5.5	7.0	104.3
7	39.0	338	0.680	1.05	110.81	68	243	236	49	43	5.5	7.0	106.3
8	42.0	338	0.700	1.10	112.61	68	242	237	51	43	5.5	8.0	105.9
8	45.0	333	0.650	1.00	114.43	68	242	238	50	42	5.5	8.0	104.1
9	48.0	325	0.550	0.90	116.16	68	242	237	52	43	5.5	9.0	104.8
9	51.0	316	0.450	0.60	117.77	68	242	237	51	44	5.5	9.0	98.7
10	54.0	315	0.350	0.50	119.15	69	242	232	50	43	4.0	10.0	98.7
10	57.0	296	0.350	0.52	120.37	68	241	235	52	43	4.0	10.0	101.6
	60.0				121.64								
TRAVERSE NO. 2													
1	0.0	353	0.630	0.98	122.10	67	242	240	50	49	5.5	1.0	109.3
1	3.0	347	0.450	0.59	123.86	69	242	240	55	42	4.5	1.0	100.5
2	6.0	346	0.550	0.88	125.24	69	242	241	58	42	6.0	2.0	112.0
2	9.0	345	0.610	0.95	126.94	70	243	242	54	42	5.0	2.0	109.2
3	12.0	346	0.700	1.10	128.69	70	245	242	49	42	6.0	3.0	107.2
3	15.0	343	0.550	0.89	130.53	71	245	245	48	42	5.5	3.0	112.0
4	18.0	344	0.720	1.10	132.24	72	244	241	48	42	6.0	4.0	105.3
4	21.0	345	0.750	1.20	134.08	72	245	243	49	43	6.0	4.0	105.5
5	24.0	344	0.760	1.20	135.96	72	244	243	49	43	6.0	5.0	104.7
5	27.0	344	0.760	1.20	137.84	72	246	244	50	44	6.0	5.0	104.7
6	30.0	345	0.750	1.15	139.72	73	246	243	50	45	6.0	6.0	102.4
6	33.0	344	0.630	0.96	141.55	73	245	243	51	45	5.5	6.0	104.9
7	36.0	344	0.690	1.05	143.27	74	245	244	51	45	6.0	7.0	106.6

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-21-95
RUN : T8-OC-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	345	0.740	1.10	145.10	74	246	243	50	46	6.0	7.0	106.4
8	42.0	346	0.650	0.95	146.99	74	246	245	52	46	5.5	8.0	103.8
8	45.0	347	0.720	1.00	148.72	75	245	244	52	46	5.5	8.0	103.2
9	48.0	333	0.450	0.55	150.53	75	247	245	52	46	4.5	9.0	99.9
9	51.0	337	0.550	0.85	151.93	75	246	244	53	47	5.0	9.0	106.2
10	54.0	338	0.550	0.83	153.57	75	247	245	53	46	5.0	10.0	105.0
10	57.0	345	0.650	0.93	155.19	76	245	244	53	46	5.5	10.0	104.6
	60.0				156.94								
		338	0.586	0.91		68	243	241	51	43	5.3		106.0

ISOKINETIC TEST DATA FORM

Sample Type: Organics Reference Method: EPA M23 Page 1 of 5

Client:	Rigo + Rigo	City, Province:	Layton, UTAH
Project Number:	5416265	Test Number:	T8-OCA
Sample Location:	B Stack	Date:	Nov 21/95
Start Time:	8:45	Finish Time:	11:30
Barometric Press. (in Hg):	25.4	Stack Press(in H_2O): + or -:	-0.52
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes (No)

Sample Box Number:	T1	Gas Meter Factor:	0.983	Calibration Date:	Sept 19/95
Nozzle I.D.:	T1-2	Nozzle Diameter (in.):	0.228	Calibration Date:	Nov 16/95
Probe I.D.:	T2-7	Pitot Coefficient:	0.796	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): _____ 0_2 (%): _____ CO (ppm): _____ Other: _____

Impinger 1 (g)	208.3	Assumed H_2O (%):	
Impinger 2 (g)	6.6	Filter I.D. #:	—
Impinger 3 (g)	1.4	Net Filter Wt. (g):	—
Impinger 4 (g)	1.5	Net Probe Wash Wt. (g):	—
Impinger 5 (g) 5.6	10.9	Imp. Residue Wt. (g):	—
~~Impinger 6 (g)~~ Condenser	0.0		
XAD-2 Trap (g)	3.4		
Total H_2O Condensed (g)	232.1		

Sampling Comments: Train 03
Trap #3

Process Rate: _____

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: NOV. 21/95

MOISTURE ANALYSIS DATA SHEET

Project #:	5716265	Client:	Rigo + Rigo
Date:	Nov 21/95	Test:	T4-OCA
Sample Location:	B Stack	Filter I.D.:	
Pre Weights by:	HVB	Post Weights by:	JM

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	MT	661.9	453.6	208.3
2	RODI	609.8	603.2	6.6
3	RODI	613.3	611.9	1.4
4	MT	474.1	472.6	1.5
5	S.G.	747.0	736.1	10.9
6				
7				
8 Condenser		232.0	232.0	0.0
XAD Trap		248.2	244.8	3.4
			Total (g)	232.1

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: Train 03
Train 3 Trap

Signature:

Nov. 21/95
Date:

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BOVAR-CONCORD Environmental

DATE: 2/11/95 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: JM/JM

Run #: T9-CA Traverse #: 1 Traverse Direction: NORTH Start Time: 8:45 Finish Time: /

Pt. (FOR WIPE)	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.57	0.90	/	89.78	340	241	252	38	42	59	58	4.0
	3		0.47	0.85	91.39	91.47	339	240	249	38	48	62	60	4.5
2	6		0.40	0.70	92.89	93.00	336	240	243	38	47	62	60	4.5
	9		0.45	0.72	94.26	94.45	335	242	246	39	50	63	60	4.5
3	12		0.45	0.69	95.88	95.95	336	242	242	39	49	63	60	4.5
	15		0.57	0.90	97.38	97.37	340	241	242	39	50	63	60	5.0
4	18		0.55	0.92	98.98	98.91	336	241	237	40	51	64	60	5.5
	21		0.60	0.97	100.49	100.67	338	242	237	40	52	65	61	5.5
5	24		0.60	0.94	102.32	102.38	338	243	242	41	53	65	61	5.5
	27		0.45	0.63	104.04	104.15	336	243	240	42	55	67	62	4.5
6	30		0.70	1.10	105.58	105.56	343	243	232	42	50	67	62	5.5
	33		0.70	1.10	107.35	107.36	341	242	233	42	48	67	62	5.5

89.45 / ~~84.15~~ / ~~87.64~~

Pre test leak check: Rate (cfm) ~~0.02~~ at 15 inches Hg (Vacuum) Leak Volume Start: ~~84.15~~ / ~~87.64~~ Leak Volume End: 89.78

Post test leak check: Rate (cfm) / at / inches Hg (Vacuum) Leak Volume Start: / Leak Volume End: /

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 2/11/95 SAMPLING TRAINS DATA SHEET PAGE 3 OF 5

Client: Rigo & Rigo Project #: 5416265 Sample Location: B Stack Operators: JM/JM

Run #: T8-QA Traverse #: 1 Traverse Direction: North Start Time: — Finish Time: 9:45

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	36		0.60	0.93	109.15	109.15	338	243	233	43	48	68	63	5.5
	39		0.68	1.05	110.80	110.81	338	243	236	43	49	68	62	5.5
8	42		0.70	1.10	112.57	112.61	338	242	237	43	51	68	62	5.5
	45		0.65	1.00	114.40	114.43	333	242	238	42	50	68	63	5.5
9	48		0.55	0.90	116.15	116.16	325	242	237	43	52	68	63	5.5
	51		0.45	0.60	117.74	117.77	316	242	237	44	51	69	63	4.5
10	54		0.35	0.50	119.20	119.15	315	242	232	43	50	68	63	4.0
	57		0.35	0.52	120.41	120.37	296	241	235	43	52	68	64	4.0
	60				121.63	121.64								

Pre test leak check: Rate (cfm) — at — inches Hg (Vacuum) Leak Volume Start: — Leak Volume End: —

Post test leak check: Rate (cfm) 0.015 at 20 inches Hg (Vacuum) Leak Volume Start: 121.64 Leak Volume End: 121.85

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 2L / 11 / 95

SAMPLING TRAINS DATA SHEET

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: JM/JM

Run #: TO-OCA Traverse #: 2 Traverse Direction: EAST Start Time: 10:30 Finish Time: —

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.63	0.98	—	122.10	353	242	240	49	50	67	66	5.5
	3		0.45	0.59	123 80	123.86	347	242	240	42	55	70	67	4.5
2	6		0.55	0.88	125.29	125.24	346	242	241	42	58	70	67	6.0
	9		0.61	0.96	126.82	126.94	345	243	242	42	54	71	68	5.0
3	12		0.70	1.10	128.61	128.69	346	245	242	42	49	72	68	6.0
	15		0.55	0.89	130.48	130.53	343	245	245	42	48	73	68	5.5
4	18		0.72	1.10	132.11	132.24	344	244	241	42	48	74	69	6.0
	21		0.75	1.20	134.05	134.08	345	245	243	43	49	74	69	6.0
5	24		0.76	1.20	135.93	135.96	344	244	243	43	49	75	69	6.0
	27		0.76	1.20	137.82	137.84	344	246	244	44	50	75	69	6.0
6	30		0.75	1.15	139.70	139.72	345	246	243	45	50	76	70	6.0
	33		0.63	0.96	141.57	141.55	344	245	243	45	51	76	70	5.5

Pre test leak check: Rate (cfm) 0.008 at 15 inches Hg (Vacuum) Leak Volume Start: 121.55 Leak Volume End: 122.10

Post test leak check: Rate (cfm) — at — inches Hg (Vacuum) Leak Volume Start: — Leak Volume End: —

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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DATE: 21 / 11 / 95 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rigo & Rigo Project #: 5416265 Sample Location: B Stack Operators: JM/JM

Run #: T8-OCA Traverse #: 2 Traverse Direction: EAST Start Time: — Finish Time: 11:30

Pt. FOR WATER	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	36		0.69	1.05	143.25	143.27	344	245	244	45	51	76	71	6.0
	39		0.74	1.10	145.04	145.10	345	246	243	46	50	76	71	6.0
8	42		0.65	0.95	146.94	146.99	346	246	245	46	52	77	71	5.5
	45		0.72	1.00	148.71	148.72	347	245	244	46	52	77	72	5.5
9	48		0.45	0.55	150.53	150.53	333	247	245	46	52	77	72	4.5
	51		0.55	0.85	151.96	151.93	337	246	244	47	53	77	72	5.0
10	54		0.55	0.83	153.51	153.57	338	247	245	46	53	77	72	5.0
	57		0.65	0.93	155.15	155.19	345	245	244	46	53	78	73	5.5
	60				156.91	156.94								

Pre test leak check: Rate (cfm) — at — inches Hg (Vacuum) Leak Volume Start: — Leak Volume End: —

Post test leak check: Rate (cfm) 0.011 at 15 inches Hg (Vacuum) Leak Volume Start: 156.94 Leak Volume End: 157.12

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: Nov 21 '95 TEST T8-0CA

Client: Rigg & Rigg Layton, UTAH Location: B Stack Operator: JM / JM

Sample Type: Organics Reference Method: EPA MZ3

Modifications: Recovery following Environment Canada procedures with train rinse with acetone/DCM + proving rinse with toluene

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	0.86 " H_2O
Static positive or negative	⟷	-ve
Average Temperature	⟷	360-400 °F
Estimate % H_2O	⟷	
How estimated?	⟷	T2 - Moisture
Estimate Gas Composition	⟷	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	⟷	T1 - T7 - CEM
Proper nozzle selected?	✓	
K factor	⟷	
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other	✓	watch
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	Proving rinse after T7-0CB
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5416265 DATE: Nov 21/95 TEST T6-OCA

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	→	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type	K	
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 5416265 DATE: Nov 21/95 TEST TO-0CA

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	Empty
#2	⟷	RODI water
#3	⟷	RODI water
#4	⟷	Empty
#5	⟷	Silica Gel
~~#6~~	⟷	
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	⟷	
Grease used on joints	X	
Silica gel type	⟷	
New?		
Used?	✓	
Pre Test Leak Check		
Performed	✓	
Rate	⟷	0.017 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	25% spent
Leak checks at port changes Before	⟷	0.015 cfm@ 20 "Hg
After	⟷	0.011 cfm@ 15 "Hg
Final leak race acceptable	⟷	0.008 cfm@ 15 "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	RB / JA
Clean-up area - General Environment	⟷	Clean
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 5416265 DATE: Nov 21/95 TEST Tg-OCA

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	⟷	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass		filter in cleaned foil in plastic
plastic		bag
Balance Type	⟷	Top Loader
Calibrated or QC checked	⟷	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		Good
Colour of Filter	✓	
Foil Wrapped?	✓	
Probe Rinses		
Acetone / DCM	✓	
~~Other~~ Toluene.	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

#9

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN RECOVERY DATA FORM

LOCATION: B-Stack **TEST #:** T8-OCA **DATE:** Nov 21/95 **PROJECT NO.:** 541-6265

Nozzle, Probe Liner Front Half Filter Holder All equipment	Filter	Back Half Filter Holder and Condenser Coil All Equipment	XAD Resin	Impingers & ~~HPLC Rinse~~ ECDI	~~Back Half Rinse~~
Wash and brush 3x each with ~~hexane~~ DCM and acetone. Rinse 3x with with ~~hexane~~ DCM and and acetone.	Remove and place on pre-cleaned foil fold in half and place in ~~petri dish~~ Zip Loc bag	**Weigh Coil & Record Weight** ~~Soak 5 minutes each with hexane and acetone. Rinse 3x with hexane and acetone.~~ Toluene Proof	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 #4 into container. ~~Rinse 3x with HPLC water.~~	~~Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone.~~

Container ~~TS1~~ TS2 Front Half Acetone ~~Hexane~~ DCM Rinse	
Final Wt.:	533.0
Initial Wt.:	264.2
Gain:	268.8

Container ~~TS2~~ TS1 Filter	
Filter ID:	T8-OCA
Colour:	White

few black specks.

Container TS3 Back Half Filter and Condenser Coil	
Final Wt.:	499.9
Initial Wt.:	266.4
Gain:	233.5
Colour:	Clear

Container TS4 XAD Resin

Wrap in Foil	
XAD:	CX454-30
Colour:	White

Trap Train #3

Container TS5 Impinger Contents	
Final Wt.:	717.1
Initial Wt.:	266.6
Gain:	450.5
Colour:	

~~Container TS6 Back Half Rinse~~	
Final Wt.:	
Initial Wt.:	
Gain:	
Colour:	

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	03
~~HPLC~~ ECDI Batch No.:	Zenon 95/10/26
Acetone Batch No.:	Caledon 14123
~~Hexane~~ DCM Batch No.:	Caledon 16700
Filter Batch No.: Zenon 95/10/26	XAD No.: Train #3
Train Assembled By:	HVO
Train Recovered By:	RB

Reagent Blanks Collected?	Yes
Combined Acetone/~~Hexane~~ DCM	Yes.
~~Combined Glycol~~/Water	Yes
Blank Train Collected?	Yes.
Comments:	

EPSRECDRW-May 95

BOVAR-CONCORD Environmental

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-21-95
RUN : T8-MP-A
LOC. : B STACK

RUN TIME : 10:54 TO 13:22

METALS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
METALS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	2.0337 DSm3	71.810 DScf
AVERAGE ISOKINETICITY	106.2 %	

FLUE GAS CHARACTERISTICS

MOISTURE	14.56 %	
TEMPERATURE	174.5 deg C	346.1 deg F
FLOW	45165 DSm3/hr	26584 DScfm
	93611 Am3/hr	55098 Acfm
VELOCITY	18.27 m/s	3596.3 fpm

GAS ANALYSIS	O2	10.18 %
	CO2	10.00 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.12 g/gmole D.B.
	MOL. WT.	28.36 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO	DATE : 11-21-95
JOBSITE : LAYTON UTAH	RUN : T8-MP-A
REF.No. : 5416265	LOC. : B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.0 kPa	25.40 in.Hg
STATIC PRESSURE	-129.5 Pa	-0.52 in.H2O
NOZZLE DIAMETER	6.20 mm	0.2440 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	177.8 g
CONDENSATION IN IMPINGER 2	47.7 g
CONDENSATION IN IMPINGER 3	12.8 g
CONDENSATION IN IMPINGER 4	1.7 g
CONDENSATION IN IMPINGER 5	-0.2 g
CONDENSATION IN IMPINGER 6	-0.5 g
SILICA GEL WEIGHT GAIN	15.7 g
TOTAL MOISTURE GAIN	255.0 g

METALS COLLECTION

FILTER METALS	0.0000 mg
WASHINGS METALS	0.0000 mg
IMPINGER METALS	0.0000 mg
TOTAL METALS	0.0000 mg

TOTAL SAMPLING TIME	120.0 min.

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-21-95
RUN : T8-MP-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	321	0.510	1.20	492.15	69	227	251	44	1.0	1.0	110.4
1	3.0	321	0.510	1.15	494.02	70	228	261	44	1.0	1.0	107.8
2	6.0	318	0.520	1.15	495.85	71	229	256	44	1.0	2.0	106.3
2	9.0	319	0.540	1.20	497.68	72	230	255	45	1.0	2.0	104.1
3	12.0	334	0.700	1.60	499.51	73	229	256	46	1.0	3.0	106.0
3	15.0	339	0.760	1.70	501.61	74	229	254	46	1.0	3.0	103.8
4	18.0	345	0.760	1.50	503.75	74	230	255	48	1.0	4.0	108.4
4	21.0	349	0.880	1.90	505.98	75	230	257	48	1.0	4.0	105.5
5	24.0	348	0.850	1.90	508.31	75	231	257	50	1.0	5.0	107.3
5	27.0	349	0.860	1.95	510.64	76	231	257	51	1.0	5.0	108.0
6	30.0	349	0.530	1.10	513.00	76	231	257	51	1.0	6.0	109.9
6	33.0	350	0.570	1.15	514.89	77	231	256	51	1.0	6.0	103.6
7	36.0	349	0.520	1.00	516.74	77	230	255	50	1.0	7.0	103.1
7	39.0	348	0.510	1.05	518.50	77	231	257	50	1.0	7.0	100.4
8	42.0	345	0.480	0.97	520.20	78	230	258	50	1.0	8.0	103.8
8	45.0	347	0.570	1.15	521.91	78	230	258	51	1.0	8.0	105.4
9	48.0	347	0.520	1.05	523.80	78	231	257	51	1.0	9.0	103.9
9	51.0	339	0.510	1.05	525.58	79	231	259	52	1.0	9.0	103.7
10	54.0	342	0.510	1.10	527.35	79	232	260	52	1.0	10.0	102.7
10	57.0	341	0.480	1.00	529.10	79	232	258	53	1.0	10.0	105.2
	60.0				530.84							
TRAVERSE NO. 2												
1	0.0	348	0.670	1.55	531.57	78	233	261	56	1.0	1.0	109.8
1	3.0	349	0.740	1.75	533.70	79	234	259	57	1.0	1.0	108.7
2	6.0	352	0.870	2.00	535.92	80	235	257	55	1.0	2.0	108.0
2	9.0	352	0.740	1.70	538.31	81	235	260	54	1.0	2.0	107.5
3	12.0	350	0.700	1.55	540.51	82	235	258	54	1.0	3.0	107.8
3	15.0	357	0.800	1.80	542.66	82	234	259	54	1.0	3.0	106.0
4	18.0	351	0.800	1.80	544.91	82	234	258	54	1.0	4.0	106.5
4	21.0	350	0.780	1.75	547.18	82	234	260	54	1.0	4.0	106.3
5	24.0	352	0.900	2.10	549.42	83	235	256	55	1.0	5.0	107.9
5	27.0	354	0.940	2.20	551.86	83	234	257	56	1.0	5.0	109.2
6	30.0	354	0.800	1.80	554.38	84	234	260	56	1.0	6.0	108.6
6	33.0	354	0.850	1.90	556.70	84	235	259	57	1.0	6.0	105.5
7	36.0	355	0.840	1.85	559.02	84	235	256	56	1.0	7.0	106.5

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-21-95
RUN : T8-MP-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	354	0.800	1.75	561.35	84	234	259	56	1.0	7.0	105.8
8	42.0	355	0.830	1.80	563.61	85	234	259	57	1.0	8.0	105.2
8	45.0	352	0.790	1.75	565.90	85	234	261	58	1.0	8.0	104.4
9	48.0	352	0.700	1.50	568.12	85	234	260	58	1.0	9.0	107.3
9	51.0	351	0.780	1.75	570.27	86	234	257	58	1.0	9.0	105.2
10	54.0	348	0.770	1.70	572.50	86	233	261	57	1.0	10.0	107.1
10	57.0	352	0.750	1.55	574.76	86	233	260	57	1.0	10.0	102.5
	60.0				576.89							
		346	0.691	1.54		79	232	258	52	1.0		106.2

ISOKINETIC TEST DATA FORM

Sample Type: MS Reference Method: EPA M29 Page 1 of 5

Client:	Rigo + Rigo	City, Province:	Layton, Utah
Project Number:	5916265	Test Number:	TB-MP-A
Sample Location:	B Stack	Date:	95/11/21
Start Time:	10:54	Finish Time:	13:22
Barometric Press. (in Hg):	85-9mb = 25.4" Hg	Stack Press(in H_2O): + or -:	-.52
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes No

Sample Box Number:	T3	Gas Meter Factor:	1.006	Calibration Date:	Sept/95
Nozzle I.D.:	QL	Nozzle Diameter (in.):	.244	Calibration Date:	Nov/95
Probe I.D.:	T1-7'	Pitot Coefficient:	0.798 MB	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): _____ 0_2 (%): _____ CO (ppm): _____ Other: _____

Impinger 1 (g)	172.8	Assumed H_2O (%):	14
Impinger 2 (g)	42.7	Filter I.D. #:	5114A 102504
Impinger 3 (g)	12.9	Net Filter Wt. (g):	
Impinger 4 (g)	1.7	Net Probe Wash Wt. (g):	
Impinger 5 (g)	-0.2	Imp. Residue Wt. (g):	
Impinger 6 (g)	-0.5		
~~XAD-2~~ Trap (g)	15.7		
Total H_2O Condensed (g)	255		

Sampling Comments: _____

Process Rate: _____

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: _____

MOISTURE ANALYSIS DATA SHEET

Project #:	5916265	Client:	Browkrigg
Date:	95-11-20	Test:	Te-MP-A
Sample Location:	stack	Filter I.D.:	2504
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	876.9	499.1	177.8
2	5% HNO3 10% H2O2	611.6	565.9	47.7
3	5% HNO3; 10% H2O2	628.9	616.1	12.8
4	Blank	492.3	490.6	1.7
5	KMnO4	593.9	594.1	-.2
6	KMnO4	603.7	604.2	-.5
7	SG.	825.6	809.9	15.7
8				
XAD Trap				
			Total (g)	255

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	147.5	147.7	✓	JA
Post weights	295.0	295.2	–	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: ______________________

Signature: [signature]

Date: 95-11-21

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BOVAR-CONCORD Environmental

DATE: 5/11/21 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Resolute Project #: 5414265 Sample Location: B Stack Operators: JW/JM

Run #: ~~TB-MP-A~~ TB-MP-A Traverse #: 1 Traverse Direction: UN Start Time: 10:59 Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		.51	1.7		492.148	321	227	251	44	NA	69	68	1.0
1	3		.51	1.15	493.473	494.02	321	228	261	44		71	68	1.0
2	6		052	1.15	*495.845	495.85	318	229	256	44		73	68	1.0
2	9		0.54	1.2	497.693	497.68	319	230	255	45		75	69	1.0
3	12		0.70	1.6	*499.558	499.51	334	229	256	46		75	70	1.0
3	15		0.76	1.7	501.648	501.61	339	229	254	46		77	70	1.0
4	18		0.74	1.85	*503.838	503.75	345	230	255	48		77	71	1.0
4	21		0.88	1.9	505.978	505.98	349	230	257	48		78	72	1.0
5	24		0.85	1.9	*508.378	508.31	348	231	257	50		78	72	1.0
5	27		0.86	1.95	510.63	510.64	349	231	257	51		78	73	1.0
6	30		0.53	1.1	*512.973	513.00	349	231	257	51		78	73	1.0
6	33		0.57	1.15	514.832	514.89	350	231	256	51		79	74	1.0
7	36		0.52	1.0	*516.79	516.74	349	230	255	50		79	74	1.0

Pre test leak check: Rate (cfm) .007 at 16 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .007 at 18 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

MB

DATE: 5/11/21 SAMPLING TRAINS DATA SHEET PAGE 3 OF 5

Client: RGO+RGO Project #: 5416265 Sample Location: B Stack Operators: JW/JM

Run #: T8-MP-A Traverse #: 1 Traverse Direction: IN Start Time: 10:54 Finish Time: 11:54

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	39		0.51	1.05	518.555	518.50	348	231	257	50		79	74	1.0
8	42		.48	0.97	*520.297	520.20	345	230	258	50		80	75	1.0
8	45		.57	1.15	521.944	521.91	347	230	258	51		80	75	1.0
9	48		0.52	1.05	*523.81	523.80	342	231	257	51		81	75	1.0
9	51		0.51	1.05	525.615	525.58	339	231	259	52		81	76	1.0
10	54		0.51	1.1	*527.377	527.35	342	232	260	52		81	76	1.0
10	57		0.48	1.0	529.147	529.10	341	232	258	53		81	76	1.0
10	60				530.844	530.841								

NA

Pre test leak check: Rate (cfm) .007 at 16 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .007 at 18 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

NHS

DATE: 05/11/21 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: RgotRijo Project #: 5416265 Sample Location: B Stack Operators: JLD/JM

Run #: T8-mp-A Traverse #: 2 Traverse Direction: OUT Start Time: 12:22 Finish Time: 13:22

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		.67	1.55		531.569	348	233	261	56	NA	78	77	1.0
1	3		0.74	1.75	533.678	533.70	349	234	259	57		81	77	1.0
2	6		0.87	2.0	*535.864	535.92	352	235	257	55		83	77	1.0
2	9		0.74	1.7	538.267	539.31	352	235	260	54		84	78	1.0
3	12		0.70	1.55	*540.474	540.51	350	235	258	54		85	79	1.0
3	15		0.90	1.8	542.645	542.66	351	234	259	54		84	79	1.0
4	18		0.80	1.8	*544.91	544.91	351	234	258	54		85	79	1.0
4	21		0780	1.75	547.16	547.18	350	234	260	54		85	79	1.0
5	24		0.90	2.1	*549.402	549.42	352	235	256	55		86	80	1.0
5	27		0.94	2.2	551.807	551.86	354	234	257	56		86	80	1.0
6	30		0.80	1.8	*554.299	554.38	354	234	260	56		87	81	1.0
6	33		0.95	1.9	556.63	556.70	354	235	259	57		86	81	1.0
7	30		0.84	1.85	*557.95	559.02	355	235	256	56		87	81	1.0

Pre test leak check: Rate (cfm) .008 at 16 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .006 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 05/11/21 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rio Tinto Project #: 5416265 Sample Location: B Stack Operators: SW/JM

Run #: TB MP-A Traverse #: 2 Traverse Direction: OUT Start Time: 12:22 Finish Time: 13:22

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	39		0.80	1.75	561.326	561.35	354	234	259	56	NA	87	81	1.0
8	42		0.83	1.8	*563.160	563.161	355	234	259	57		87	82	1.0
8	45		0.79	1.75	565.902	565.90	352	234	261	58		87	82	1.0
9	48		0.70	1.5	*568.136	568.12	352	234	260	58		87	82	1.0
9	51		0.78	1.75	570.225	570.27	351	234	257	58		88	83	1.0
10	54		0.77	1.7	*572.492	572.50	348	233	261	57		88	83	1.0
10	57		0.75	1.55	574.708	574.76	352	233	260	57		88	83	1.0
10	60				576.887	576.888								

Pre test leak check: Rate (cfm) .008 at 16 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .006 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: 5/1/21 TEST T8-MP-A

Client: R50 thigh Location: B Stack. Operator: JW

Sample Type: MS Reference Method: EPA M29

Modifications: _____

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	
Static positive or negative	⟷	NS.
Average Temperature	⟷	
Estimate % H_2O	⟷	14
How estimated?	⟷	MB
Estimate Gas Composition	⟷	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	⟷	previous tests
Proper nozzle selected?	✓	
K factor	⟷	
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other		Watch barometer.
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or		
Quartz	✓	
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or		
Quartz or	✓	
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5416265 DATE: 951121 TEST T8-mp-A

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	----	
Connected to:	✓	
inclined manometer		
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor		
Thermocouple	✓	
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre		
Quartz	✓	
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	✓	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol	NA	
Thermocouple attached to trap		
XAD-2 Trap covered with foil at all times		

PROJECT # 54116265 DATE: 951121 TEST TB-MP-A

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	7	
Contents #1		MT
#2		Nitric
#3		Nitric
#4		MT
#5		Permanganate
#6		Permanganate
Impinger weights recorded	✓	S.G.
Impingers properly assembled	✓	
Recirculating pump set up properly		
Modifications		
Grease used on joints		
Silica gel type		
New?	✓	
Used?		
Pre Test Leak Check		
Performed		
Rate		.007 cfm@ 16 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	NA	
Probe temperature 250 ± 25°F		
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel		
Leak checks at port changes Before		.007 cfm@ 18 "Hg
After		.008 cfm@ 15 "Hg
Final leak race acceptable		.006 cfm@ 15 "Hg
General comments on sampling technique		
Sample recovery performed on-site?	✓	
Sample recovery performed by		JA
Clean-up area - General Environment		Clean
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

QA/QC CHECKLIST

PROJECT # 541625 DATE: 9/9/21 TEST T8-MP-A

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	✓	teflon
Leak free		
Petri Dishes: borosilicate glass		
plastic	✓	
Balance Type	✓	digital toploader.
Calibrated or QC checked	✓	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		Blue
Weighed	✓	
Filter Handling	✓	
Tweezers used?	✓	
Condition?	✓	
Colour of Filter		Barely noticable
Foil Wrapped?		petri dish
Probe Rinses		
Acetone	✓	
Other	✓	HNO_3 0.1 N
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	NA	
Blank Train	✓	Reagent
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: ~~95-#22~~ Stack B TEST #: T8-MP-A DATE: 95.11.27 PROJECT NO.: 54-16265

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	**Container TS3 Front Half 0.1 N HNO3 Rinse** Final Wt.: 528.1 Initial Wt.: 262.8 Gain: 265.3 Comments:	Brush loose particulate onto filter	**Container TS4-1 Impinger 4 Contents** Final Wt.: 712.3 Initial Wt.: 266.4 Gain: 445.9	**Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse** Final Wt.: 509.9 Initial Wt.: 266.3 Gain: 243.6 Colour: CLEAR	Rinse with 100 mL 0.1 N HNO3	Rinse 3x with 100 mL Acidified KMnO4	Place rinsing in Container 5C which contains 200 mL of water	
Container TS2 Front Half Acetone Rinse Final Wt.: 347.0 Initial Wt.: 262.2 Gain: 84.8 Comments:		**Filter TS2** Seal petri dish with tape Colour: GREY-BROWN Filter #: 5114A			**Container TSA Impinger 4 Contents** Final Wt.: 395.3 Initial Wt.: 266.7 Gain: 128.6	Rinse with 100 mL water	**Container 5C HCL Rinse** Final Wt.: 503.9 Initial Wt.: 266.7 Gain: 237.2 Colour: CLEAR	
						Container 5B Impinger 5 & 6 KMnO4 Content and Rinses Final Wt.: 721.9 Initial Wt.: 266.2 Gain: 455.7 Colour: PURPLE		

102504
probe wash may contain part of filter

Train Identification	Blanks	
Train No.:		
HNO3 / H2O2 Batch No.:	Container 9	200 mLs
DI Water Batch No.:	Container 8B	100 mLs
Acetone Batch No.:	Container 7	100 mLs
0.1 N HNO3 Batch No.:	Container 8A	300 mLs
Acidified KMnO4 Batch No.:	Container 10	100 mLs
8 N HCl / Batch No.: DI Water	Container 11	25 mL / 200 mL
Filter Number:	Container 12	* _____

Mark Liquid Level on Containers
Seal and Label Containers
Reagent Blanks Submitted? Yes ✓ No ____
Prepare Fresh Acidified KMnO4 Daily ✓

M29REC.DRW-May 95

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Time on 12:30

METHOD 26
HCl SAMPLING DATA FORM

Bp = 25.29 in Hg

Company Name	Davis County	Plant Location	Layton, Utah	Source Name	Stack B
Test Date	Nov 21 /95	Test Number	T10-HCl-B	Job Number	5416265
Sampling for	HCl	Meter Box	V1 γ=1.001	B.P. mm/inHg	854 mbar

ABSORBING SOL'N	15 ml 0.1 N H_2SO_4	15 ml 0.1 N H_2SO_4	15 ml 0.1 N NaOH	15 ml 0.1 N NaOH	Silica Gel	GAS	1	2	3	4
WEIGHTS	IMP 1	IMP 2	IMP 3	IMP 4	IMP 5	READINGS				
EMPTY						O2				
FILLED FINAL						C02				
FILLED INITIAL						CO				
DIFFERENCE						TIME				

OPERATOR	LM	Sample Rate (Lpm)	~2	H20 Condensed		
Lk.Chk, (Init.)	0 cc/min	Lk. Chk. (Final)	0 cc/min	Probe Purged	(Yes) (circled)	No)

Sample Time	Clock Time	Volume ~~m³~~ L Desired	Actual	Vacuum in.Hg	Meter Temp. °C/°F	Probe Temp. °C/°F	Box Temp. °C/°F	Impinger Temp. °C/°F
0	0		1023.8	1	62.5	279	215	
10	5		1034.3	1	62	268	220	
20	10		1044.65	1	63	290	228	
30	15		1054.75	1	64	295	232	
40	20		1065.0	1	66	290	290	
50	25		1075.25	1	66.5	248	281	
60	30		1085.45	1	67.5	325	272	
70	35		1095.75	1	68	250	268	
80	40		1105.45	1	69.5	271	265	
90	45		1116.1	1	70.5	309	264	
100	50		1126.3	1	71	250	263	
110	55		1136.5	1	72	302	261	
120	60		1146.7	1	71.5	255	261	
		AVG/TOT	122.9	1	67.2	275	255	

4.340 ft³

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Time off 13:30

BOVAR-CONCORD Environmental

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	R&R
Date:	95.11.21	Test:	T10-HCl-B
Sample Location:	STACK A	Filter I.D.:	—
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	93.1	86.0	7.1
2	0.1N H_2SO_4	101.7	95.7	6.0
3	0.1N H_2SO_4	106.6	106.4	0.2
4	Blank	71.0	71.0	0
5	0.1N NaOH	100.0	99.9	0.1
6	0.1N NaOH	97.0	96.9	0.1
7	S.G.	122.5	121.4	1.0
8				
XAD Trap				
			Total (g)	14.5

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	147.5	147.6	✓	JA
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.21

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BOVAR-CONCORD Environmental

HCl METHOD 26 SAMPLING TRAIN
RECOVERY DATA FORM

PROJECT NO.: 5416265

LOCATION: STACK B TEST #: T10-HCl-B DATE: 95.11.21

Impingers 1 and 2	Impingers 3 and 4
Weigh impingers Empty contents into container and rinse with DI water	Weigh impingers Empty contents into container and rinse with DI water

Container TS1 Impingers 1 and 2 0.1 N H2SO4 Contents and DI Water Rinses	
Final Wt.:	124.2
Initial Wt.:	24.2
Gain:	100.0

Container TS2 Impingers 3 and 4 0.1 N NaOH Contents and DI Water Rinses	
Final Wt.:	124.7
Initial Wt.:	24.7
Gain:	100.0

Mark Liquid Level	Seal and Label

Train Identification
Train No.:
0.1 N H2SO4 Batch No.:
DI Water Batch No.:
0.1 N NaOH Batch No.:
Train Loaded By: JA
Recovered By: JA
Reagent Blank Submitted: Yes ✓ No ____

BOVAR-CONCORD Environmental

1 of 3

SYSTEM CALIBRATION AND DRIFT CALCULATIONS

CLIENT	RIGO+RIGO	DATE	NOV21/95
PROJECT NUMBER	5416265	TIME START	14:45
SAMPLE LOCATION	STACK	TIME FINISH	18:02
	TEST NUMBER	T9CEMB	

INSTRUMENT SPAN VALUES

OXYGEN	25	%	CARBON DIOXIDE	20	%
SULPHUR DIOXIDE	1000	PPM	CARBON MONOXIDE	1000	PPM
NITROGEN OXIDES	1000	PPM	TOTAL HYDROCARBO	100	PPM

			INITIAL VALUES		FINAL VALUES		
ITEM	CAL.GAS VALUE	ANAL. CAL.	SYSTEM CAL.	SYSTEM CAL. BIAS (% SPAN)	SYSTEM CAL.	SYSTEM CAL. BIAS (% SPAN)	DRIFT (% SPAN)
O2 ZERO	0	0.03	0.03	0.0	0.07	0.2	0.2
O2 CAL	9.91	9.91	9.89	-0.1	9.93	0.1	0.2
SO2 ZERO	0	0.7	0.9	0.0	1.5	0.1	0.1
SO2 SPAN	149	149	144	-0.5	146	-0.3	0.2
NOX ZERO	0	0.64	0.65	0.0	0.5	-0.0	-0.0
NOX SPAN	302	304	302	-0.2	304	0.0	0.2
CO2 ZERO	0	0.1	0.1	0.0	0.13	0.1	0.1
CO2 SPAN	7.01	7.04	7.04	0.0	7.04	0.0	0.0
CO ZERO	0	-0.1	-0.14	-0.0	-0.07	0.0	0.0
CO SPAN	100	98	99	0.1	99	0.1	0.0
THC ZERO	0	0.9	1	0.1	1.3	0.4	0.3
THC SPAN	20.1	20.2	20.5	0.3	19.5	-0.7	-1.0

DRIFT CRITERIA <5% SPAN
BIAS CRITERIA <5% SPAN

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO	DATE : 11.21.95
JOBSITE : LAYTON UTAH	RUN : T9-OC-B
REF.No. : 5416265	LOC. : STACK B

RUN TIME : 14:10 TO 16:30

ORGANICS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
ORGANICS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	1.6657 DSm3	58.818 DScf
AVERAGE ISOKINETICITY	100.2 %	

FLUE GAS CHARACTERISTICS

MOISTURE	14.30 %	
TEMPERATURE	178.2 deg C	352.8 deg F
FLOW	44904 DSm3/hr	26430 DScfm
	93564 Am3/hr	55070 Acfm
VELOCITY	18.26 m/s	3594.5 fpm

GAS ANALYSIS	O2	10.53 %
	CO2	9.54 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.06 g/gmole D.B.
	MOL. WT.	28.34 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.21.95
RUN : T9-OC-B
LOC. : STACK B

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.0 kPa	25.40 in.Hg
STATIC PRESSURE	-129.5 Pa	-0.52 in.H2O
NOZZLE DIAMETER	5.79 mm	0.2280 in.
PITOT COEFFICIENT	0.796	
METER CORRECTION FACTOR	0.983	

CONDENSATE COLLECTION

RESIN TRAP CONDENSATE	2.3 g
CONDENSATION IN IMPINGER 1	184.7 g
CONDENSATION IN IMPINGER 2	1.9 g
CONDENSATION IN IMPINGER 3	1.0 g
CONDENSATION IN IMPINGER 4	0.8 g
SILICA GEL WEIGHT GAIN	13.8 g
TOTAL MOISTURE GAIN	204.5 g

ORGANICS COLLECTION

FILTER ORGANICS	0.0000 mg
WASHINGS ORGANICS	0.0000 mg
RESIN ORGANICS	0.0000 mg
IMPINGER ORGANICS	0.0000 mg
TOTAL ORGANICS	0.0000 mg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.21.95
RUN : T9-OC-B
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1													
1	0.0	336	0.400	0.49	358.02	78	246	245	55	55	4.0	1.0	99.6
1	3.0	336	0.340	0.40	359.37	79	246	244	54	52	4.0	1.0	80.7
2	6.0	343	0.500	0.70	360.38	78	247	244	49	51	7.0	2.0	101.4
2	9.0	344	0.500	0.68	361.91	79	245	245	47	51	7.0	2.0	101.3
3	12.0	349	0.500	0.68	363.44	79	247	244	45	51	7.0	3.0	103.0
3	15.0	350	0.520	0.69	364.99	79	246	246	46	52	7.0	3.0	101.1
4	18.0	355	0.600	0.78	366.54	79	248	247	46	51	7.5	4.0	99.9
4	21.0	354	0.530	0.69	368.18	79	248	248	46	52	6.5	4.0	97.8
5	24.0	350	0.430	0.55	369.69	79	247	247	46	51	6.0	5.0	99.7
5	27.0	351	0.520	0.68	371.08	79	247	247	46	51	7.0	5.0	101.2
6	30.0	355	0.900	1.40	372.63	79	246	246	46	51	10.0	6.0	99.7
6	33.0	355	0.750	1.15	374.63	79	248	246	46	52	9.0	6.0	102.6
7	36.0	351	0.660	0.66	376.51	79	247	247	46	52	8.0	7.0	103.1
7	39.0	353	0.850	0.85	378.29	78	246	246	47	52	9.0	7.0	99.9
8	42.0	353	0.830	0.83	380.24	78	247	247	48	53	9.0	8.0	99.5
8	45.0	352	0.800	0.80	382.16	78	246	245	48	54	9.0	8.0	101.3
9	48.0	336	0.500	0.50	384.08	77	248	245	49	54	6.5	9.0	99.9
9	51.0	333	0.450	0.45	385.59	77	247	246	50	54	6.0	9.0	99.5
10	54.0	327	0.500	0.50	387.02	76	247	246	50	54	7.0	10.0	101.4
10	57.0	320	0.400	0.40	388.56	76	245	246	50	53	6.0	10.0	99.6
	60.0				389.92								
TRAVERSE NO. 2													
1	0.0	357	0.780	1.15	390.27	74	246	246	53	52	9.5	1.0	102.2
1	3.0	355	0.650	0.97	392.16	74	245	246	55	48	8.0	1.0	103.4
2	6.0	354	0.750	1.15	393.91	74	244	245	53	48	9.0	2.0	102.8
2	9.0	355	0.730	1.05	395.78	75	246	244	49	49	9.0	2.0	103.5
3	12.0	356	0.850	1.25	397.64	76	245	242	47	50	10.0	3.0	101.6
3	15.0	356	0.800	1.15	399.61	76	246	247	46	51	9.0	3.0	100.5
4	18.0	357	0.900	1.40	401.50	76	246	247	45	51	10.0	4.0	99.8
4	21.0	358	0.840	1.20	403.49	77	247	247	46	53	10.0	4.0	99.5
5	24.0	358	0.900	1.40	405.41	77	247	246	46	53	10.0	5.0	101.7
5	27.0	363	1.100	1.60	407.44	77	247	246	46	55	11.0	5.0	100.4
6	30.0	366	1.100	1.60	409.65	78	249	247	47	55	12.0	6.0	102.4
6	33.0	371	1.200	1.80	411.90	78	247	246	47	55	13.0	6.0	101.4
7	36.0	368	0.840	1.20	414.22	78	247	248	48	54	9.0	7.0	100.0

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.21.95
RUN : T9-OC-B
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	366	0.820	1.15	416.14	78	248	246	48	51	9.0	7.0	103.0
8	42.0	366	0.820	1.15	418.10	78	248	243	49	49	8.5	8.0	90.9
8	45.0	365	0.820	1.15	419.83	79	246	246	49	48	8.5	8.0	98.2
9	48.0	364	0.720	1.05	421.70	79	247	245	50	47	8.5	9.0	100.6
9	51.0	362	0.720	1.05	423.50	80	247	247	51	47	8.5	9.0	101.5
10	54.0	353	0.600	0.78	425.32	80	245	244	51	47	7.0	10.0	97.2
10	57.0	359	0.670	0.99	426.92	80	247	249	52	47	8.5	10.0	103.3
	60.0				428.71								
		353	0.687	0.95		77	247	246	48	51	8.3		100.2

ISOKINETIC TEST DATA FORM

Sample Type: Organics Reference Method: EPA M23 Page 1 of 5

Client:	Rigo + Rigo	City, Province:	Layton, UTAH
Project Number:	5416265	Test Number:	T9-OCB
Sample Location:	B Stack	Date:	Nov. 21/95
Start Time:	14:10	Finish Time:	16:30
Barometric Press. (in Hg):	25.4	Stack Press(in H_2O): + or -:	-0.52
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes (No)

Sample Box Number:	T1	Gas Meter Factor:	0.993	Calibration Date:	Sept 19/95
Nozzle I.D.:	T1-2	Nozzle Diameter (in.):	0.228	Calibration Date:	Nov 16/95
Probe I.D.:	T2-7	Pitot Coefficient:	0.796	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): 9.54 O_2 (%): 10.53 CO (ppm): _____ Other: _____

Impinger 1 (g)	184.7	Assumed H_2O (%):	14
Impinger 2 (g)	1.9	Filter I.D. #:	—
Impinger 3 (g)	1.0	Net Filter Wt. (g):	—
Impinger 4 (g)	~~13.8~~ 0.8	Net Probe Wash Wt. (g):	—
Impinger ~~5~~ (g) 5.6	~~0.8~~ 13.8	Imp. Residue Wt. (g):	—
~~Impinger 6 (g)~~ Condenser	0.8		
XAD-2 Trap (g)	1.5		
Total H_2O Condensed (g)	~~198.7~~ 204.5 AHB		

Sampling Comments: Train 04
Train 2 Trap

Process Rate: _____

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: Nov. 21 '95

BOVAR-CONCORD Environmental
AHB

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	Riso & Riso
Date:	Nov 21/95	Test:	T9-OCB
Sample Location:	B Stack	Filter I.D.:	—
Pre Weights by:	HW	Post Weights by:	JMc

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Empty	610.5	425.8	184.7
2	ROOI	615.5	613.6	1.9
3	ROOI	574.7	573.7	1.0
4	Empty	478.7	477.9	0.8
5	Silica Gel	760.8	747.0	13.8
6				
7				
~~8~~ Condenser		245.2	244.4	0.8
XAD Trap		315.2	313.7	1.5
			Total (g)	~~190.7~~ 204.5

HW

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights	147.5	147.6	✓	JMc

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: TRAIN # 04.
TRAIN 2 TRAP

Signature: JMc

Date: Nov. 21/95

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BOVAR-CONCORD Environmental

HW

DATE: 21/11/95

SAMPLING TRAINS DATA SHEET

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: JM/JM

Run #: TG-OCB Traverse #: 1 Traverse Direction: NORTH Start Time: 14:10 Finish Time: /

Pt. (Tare with)	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.40	0.49	/	358.02	336	246	245	55	55	78	78	4.0
	3		0.34	0.40	359.37	359.37	336	246	244	52	54	79	78	4.0
2	6		0.50	0.70	360.62	360.38	343	247	244	51	49	79	77	7.0
	9		0.50	0.68	361.89	361.91	344	245	245	51	47	80	78	7.0
3	12		0.50	0.68	363.42	363.44	349	247	244	51	45	80	77	7.0
	15		0.52	0.69	364.95	364.99	350	246	246	52	46	80	77	7.0
4	18		0.60	0.78	366.53	366.54	355	248	247	51	46	80	77	7.5
	21		0.53	0.69	368.20	368.18	354	248	248	52	46	80	77	6.5
5	24		0.43	0.55	369.74	369.69	350	247	247	51	46	80	77	6.0
	27		0.52	0.68	371.09	371.08	351	247	247	51	46	80	77	7.0
6	30		0.90	1.40	372.62	372.63	355	246	246	51	46	80	77	10.0
	33		0.75	1.15	374.64	374.63	355	248	246	52	46	80	77	9.0

Pre test leak check: Rate (cfm) 0.007 at 15 inches Hg (Vacuum) Leak Volume Start: 357.61 Leak Volume End: 358.02

Post test leak check: Rate (cfm) / at / inches Hg (Vacuum) Leak Volume Start: / Leak Volume End: /

K value calculated by: _____ Checked by: _____ Operator Signature: _____

Client: Riga + Riga Project #: 5416265 Sample Location: B Stack Operators: JM/JM

Run #: T9-OCB Traverse #: 1 Traverse Direction: NORTH Start Time: — Finish Time: 15:10

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	36		0.66	1.00	376.48	376.51	351	247	~~52~~ 247	~~46~~ 52	~~38~~ 46	~~80~~	77	8.0
	39		0.85	1.25	378.25	378.29	353	246	246	52	47	79	76	9.0
8	42		0.83	1.25	380.26	380.24	353	247	247	53	48	79	76	9.0
	45		0.80	1.15	382.19	382.16	352	246	245	54	48	79	76	9.0
9	48		0.50	0.67	384.07	384.08	336	248	245	54	49	78	75	6.5
	51		0.45	0.59	385.59	385.59	333	247	246	54	50	78	75	6.0
10	54		0.50	0.67	387.02	387.02	327	247	246	54	50	77	74	7.0
	57		0.40	0.49	388.53	388.56	320	245	246	53	50	77	75	6.0
	60				389.91	389.92								

Pre test leak check: Rate (cfm) — at — inches Hg (Vacuum) Leak Volume Start: — Leak Volume End: —

Post test leak check: Rate (cfm) 0.005 at 16 inches Hg (Vacuum) Leak Volume Start: 389.92 Leak Volume End: 390.11

K value calculated by: _____ Checked by: _____ Operator Signature: _____

BOVAR-CONCORD Environmental

HHB

DATE: 2/11/95 **SAMPLING TRAINS DATA SHEET** PAGE 4 OF 5

Client: Rego + Rego Project #: 5416265 Sample Location: B Stack Operators: JM/JM

Run #: TA-OCB Traverse #: 2 Traverse Direction: EAST Start Time: 15:30 Finish Time: ✓

Pt. FNR wash	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.78	1.15	✓	390.27	357	246	246	52	53	74	73	9.5
	3		0.65	0.97	392.16	392.16	355	245	246	48	55	75	73	8.0
2	6		0.75	1.15	393.88	393.91	354	244	245	48	53	75	73	9.0
	9		0.73	1.05	395.76	395.78	355	246	244	49	49	76	74	9.0
3	12		0.85	1.25	397.60	397.64	356	245	242	50	47	77	74	10.0
	15		0.80	1.15	399.61	399.61	356	246	247	51	46	77	74	9.0
4	18		0.90	1.40	401.52	401.50	357	246	247	51	45	78	74	10.0
	21		0.84	1.20	403.53	403.49	358	247	247	53	46	79	74	10.0
5	24		0.90	1.40	405.45	405.41	358	247	246	53	46	79	74	10.0
	27		1.10	1.60	407.44	407.44	363	247	246	55	46	79	75	11.0
6	30		1.10	1.60	409.68	409.65	366	249	247	55	47	80	75	12.0
	33		1.20	1.80	411.89	411.90	371	247	246	55	47	80	75	13.0

Pre test leak check: Rate (cfm) 0.001 at 16 inches Hg (Vacuum) Leak Volume Start: 390.11 Leak Volume End: 390.27

Post test leak check: Rate (cfm) ✓ at ✓ inches Hg (Vacuum) Leak Volume Start: ✓ Leak Volume End: ✓

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

VWB

DATE: 21/11/95 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rigo & Rigo Project #: 5416265 Sample Location: B Stack Operators: JM/JM

Run #: T9-OCB Traverse #: 2 Traverse Direction: EAST Start Time: / Finish Time: 16:30

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	36		0.84	1.20	414.24	414.22	368	247	248	54	48	80	75	9.0
	39		0.82	1.15	416.18	416.14	366	248	246	51	48	80	76	9.0
8	42		0.82	1.15	418.07	418.10	366	248	243	49	49	80	76	8.5
	45		0.82	1.15	420.03	419.83	365	246	246	48	49	81	76	8.5
9	48		0.72	1.05	421.76	421.70	364	247	245	47	50	81	77	8.5
	51		0.72	1.05	423.51	423.50	362	247	247	47	51	82	77	8.5
10	54		0.60	0.78	425.31	425.32	353	245	244	47	51	82	77	7.0
	57		0.67	0.99	426.98	426.92	359	247	249	47	52	82	77	8.5
	60				428.67	428.71								

Pre test leak check: Rate (cfm) / at / inches Hg (Vacuum) Leak Volume Start: / Leak Volume End: /

Post test leak check: Rate (cfm) 0.005 at 15 inches Hg (Vacuum) Leak Volume Start: 428.71 Leak Volume End: 428.89

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

QA/QC CHECKLIST

PROJECT # 5416265 DATE: NOV 21/95 TEST T9-OCB

Client: RIGG + RIGG LIMITED, UTAH Location: B STACK Operator: JM / JM

Sample Type: CERAMICS Reference Method: EPA M23

Modifications: RECOVERY FOLLOWING ENVIRONMENT CANADA PROCEDURES WITH TRAIN RINSE WITH ACETONE/DCM & PROOFING RINSE WITH TOLUENE.

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	0.6" H_2O
Static positive or negative	⟷	-0.52
Average Temperature	⟷	345°F
Estimate % H_2O	⟷	EPA M4 before T9-OCA
How estimated?	⟷	~~Effect~~
Estimate Gas Composition	⟷	O_2% 12 CO_2(%) 12 CO(ppm) ___
How Estimated?	⟷	CEM
Proper nozzle selected?	✓	
K factor	⟷	
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other	✓	WATCH
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	PROOFING RINSE AFTER T8-OCA
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	Proofing rinse after T8-OCA
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5416265 DATE: Nov 21/95 TEST T9-OCB

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	↔	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type	K	
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 5416265 DATE: Nov. 21/95 TEST T9-OCB

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	EMPTY
#2	⟷	RODI H_2O
#3	⟷	RODI H_2O
#4	⟷	EMPTY
#5	⟷	SILICA GEL
#6	⟷	
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	⟷	
Grease used on joints	X	
Silica gel type	⟷	
New?		
Used?	✓	~ 50%
Pre Test Leak Check		
Performed	✓	
Rate	⟷	0.007 cfm@ 15 "Hg-
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack		
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times		
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	75% spent
Leak checks at port changes Before	⟷	0.005 cfm@ 16 "Hg
After	⟷	0.007 cfm@ 16 "Hg
Final leak race acceptable	⟷	0.005 cfm@ 15 "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	RB/JA
Clean-up area - General Environment	⟷	CLEAN
Brushes: Nylon bristle		
Other		
Wash Bottles: Glass		

PROJECT # 5416265 DATE: NOV 21/95 TEST T9-OCB

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	⟷	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass		filter in clean foil in plastic bag
plastic		
Balance Type	⟷	top loader
Calibrated or QC checked	⟷	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		¼ BLUE / ¾ PINK
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?	✓	
Colour of Filter	✓	
Foil Wrapped?	✓	
Probe Rinses		
Acetone / DCM	✓	
~~Other~~ Toluene	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

#10

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: B- Stack TEST #: T9-OCB DATE: Nov 21/95 PROJECT NO.: 541-6265

Nozzle, Probe Liner Front Half Filter Holder. All Equipment	Filter	Back Half Filter Holder and Condenser Coil All equipment	XAD Resin	Impingers & ~~HPLC~~ Rinse RCDS	Back Half Rinse
DCM Wash and brush 3x each with ~~hexane~~ and acetone. DCM Rinse 3x with with ~~hexane~~ and and acetone.	Remove and place on pre-cleaned foil fold in half and place in ~~petri dish~~. Zip Loc bag	**Weigh Coil & Record Weight** ~~Soak 5 minutes each with hexane and acetone. Rinse 3x with hexane and acetone.~~ Toluene Prep	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into container. ~~Rinse 3x with HPLC water.~~ RB	Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone.

DCM **Container ~~TS1~~ TS2 Front Half Acetone ~~Hexane~~ Rinse**		**Container ~~TS2~~ TS1 Filter**		**Container TS3 Back Half Filter and Condenser Coil**		**Container TS4 XAD Resin**		**Container TS5 Impinger Contents**		**Container TS6 Back Half Rinse**	
Final Wt:	520.4	Filter ID:	T9-OCB	Final Wt:	522.0	**Wrap in Foil**		Final Wt:	657.4	Final Wt:	
Initial Wt:	265.6	Colour:	Slight grey	Initial Wt:	262.9	XAD:	045429	Initial Wt:	265.8	Initial Wt:	
Gain:	254.8			Gain:	259.1	Colour:	White	Gain:	391.6	Gain:	
				Colour:	Clear			Colour:	Clear	Colour:	

Train #02

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	04
~~HPLC~~ Batch No.:	Zenon 95/10/26
Acetone Batch No.:	Caledon 14123
~~Hexane~~ Batch No.:	Caledon 6700
Filter Batch No.:	Zenon 95/10/26 XAD No.: 045429
Train Assembled By:	HVB / JMB
Train Recovered By:	RB

Reagent Blanks Collected?	Yes
Combined Acetone/~~Hexane~~ DCM	Yes
~~Combined Glycol~~/Water	Yes
Blank Train Collected?	Yes
Comments:	

EPSREC.DRW-May 95

BOVAR-CONCORD Environmental

JMB

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-21-95
RUN : T9-MP-B
LOC. : B STACK

RUN TIME : 15:39 TO 17:57

METALS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
METALS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	2.1182 DSm3	74.794 DScf
AVERAGE ISOKINETICITY	103.7 %	

FLUE GAS CHARACTERISTICS

MOISTURE	14.92 %	
TEMPERATURE	181.5 deg C	358.8 deg F
FLOW	48184 DSm3/hr	28360 DScfm
	101864 Am3/hr	59955 Acfm
VELOCITY	19.88 m/s	3913.3 fpm

GAS ANALYSIS	O2	10.53 %
	CO2	9.54 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.06 g/gmole D.B.
	MOL. WT.	28.26 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-21-95
RUN : T9-MP-B
LOC. : B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.0 kPa	25.40 in.Hg
STATIC PRESSURE	-129.5 Pa	-0.52 in.H2O
NOZZLE DIAMETER	6.20 mm	0.2440 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	190.7 g
CONDENSATION IN IMPINGER 2	53.7 g
CONDENSATION IN IMPINGER 3	13.5 g
CONDENSATION IN IMPINGER 4	2.6 g
CONDENSATION IN IMPINGER 5	0.4 g
CONDENSATION IN IMPINGER 6	1.7 g
SILICA GEL WEIGHT GAIN	10.6 g
TOTAL MOISTURE GAIN	273.2 g

METALS COLLECTION

FILTER METALS	0.0000 mg
WASHINGS METALS	0.0000 mg
IMPINGER METALS	0.0000 mg
TOTAL METALS	0.0000 mg

TOTAL SAMPLING TIME 120.0 min.

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-21-95
RUN : T9-MP-B
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	330	0.530	1.05	577.78	76	233	265	52	1.0	1.0	101.9
1	3.0	331	0.530	1.05	579.55	77	232	261	50	1.0	1.0	100.6
2	6.0	334	0.620	1.40	581.30	78	231	258	50	1.0	2.0	105.3
2	9.0	338	0.640	1.40	583.28	79	232	262	48	1.0	2.0	102.7
3	12.0	357	0.880	1.80	585.24	79	232	258	48	1.0	3.0	105.9
3	15.0	357	1.000	2.10	587.58	80	231	256	47	1.0	3.0	106.4
4	18.0	361	1.100	2.15	590.09	81	231	263	46	1.0	4.0	102.1
4	21.0	369	1.300	2.30	592.61	81	230	259	46	1.0	4.0	104.0
5	24.0	371	1.000	2.10	595.39	82	231	259	46	1.0	5.0	104.9
5	27.0	367	0.900	1.80	597.85	82	231	260	46	1.0	5.0	99.8
6	30.0	367	0.930	2.00	600.08	82	232	260	48	1.0	6.0	106.6
6	33.0	367	0.690	1.50	602.50	83	232	261	48	1.0	6.0	107.2
7	36.0	367	0.670	1.40	604.60	83	233	262	48	1.0	7.0	103.6
7	39.0	366	0.680	1.35	606.60	83	233	258	48	1.0	7.0	108.4
8	42.0	366	0.740	1.40	608.71	83	231	258	47	1.0	8.0	102.8
8	45.0	366	0.780	1.40	610.80	83	230	258	48	1.0	8.0	108.8
9	48.0	366	0.750	1.40	613.07	84	230	261	49	1.0	9.0	104.5
9	51.0	361	0.650	1.30	615.21	84	229	262	49	1.0	9.0	102.4
10	54.0	360	0.650	1.30	617.17	84	229	261	49	1.0	10.0	98.7
10	57.0	357	0.600	1.20	619.06	84	229	259	49	1.0	10.0	104.2
	60.0				620.98							
TRAVERSE NO. 2												
1	0.0	350	0.620	1.40	623.06	82	232	261	49	1.0	1.0	108.3
1	3.0	351	0.700	1.55	625.09	82	233	260	46	1.0	1.0	106.1
2	6.0	352	0.770	1.70	627.20	84	234	262	46	1.0	2.0	105.7
2	9.0	352	0.780	1.65	629.41	84	235	260	47	1.0	2.0	106.3
3	12.0	354	0.840	1.70	631.65	85	234	261	47	1.0	3.0	102.0
3	15.0	356	0.890	1.75	633.88	85	235	259	49	1.0	3.0	104.2
4	18.0	359	1.000	2.20	636.22	85	235	260	49	1.0	4.0	103.9
4	21.0	362	1.000	2.20	638.69	86	236	261	49	1.0	4.0	104.9
5	24.0	364	1.000	2.20	641.18	86	235	260	50	1.0	5.0	102.5
5	27.0	365	1.100	2.20	643.61	86	235	259	50	1.0	5.0	103.8
6	30.0	370	1.200	2.20	646.19	86	235	261	51	1.0	6.0	103.2
6	33.0	371	1.100	2.15	648.86	87	234	258	51	1.0	6.0	102.4
7	36.0	366	0.850	1.70	651.40	87	234	257	52	1.0	7.0	100.9

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-21-95
RUN : T9-MP-B
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	365	0.780	1.60	653.61	87	233	257	53	1.0	7.0	100.0
8	42.0	363	0.750	1.50	655.71	87	233	259	53	1.0	8.0	100.8
8	45.0	361	0.710	1.45	657.79	87	234	258	53	1.0	8.0	100.0
9	48.0	359	0.710	1.50	659.80	87	234	255	54	1.0	9.0	103.4
9	51.0	359	0.730	1.55	661.88	86	233	258	54	1.0	9.0	104.0
10	54.0	357	0.670	1.40	664.00	86	233	258	54	1.0	10.0	102.3
10	57.0	356	0.670	1.40	666.00	86	232	257	54	1.0	10.0	103.2
	60.0				668.02							
		359	0.803	1.66		83	233	260	49	1.0		103.7

ISOKINETIC TEST DATA FORM

Sample Type: MS Reference Method: EPA M29 Page 1 of 5

Client:	Rio + Rio	City, Province:	Layton Utah
Project Number:	54162165	Test Number:	T9-MP-B
Sample Location:	B Stack	Date:	95 11 21
Start Time:	15:39	Finish Time:	17:57
Barometric Press. (in Hg):	25.4" Hg	Stack Press(in H_2O): + or -:	-.52
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes No

Sample Box Number:	T3	Gas Meter Factor:	1.006	Calibration Date:	Sept/95
Nozzle I.D.:	Q2	Nozzle Diameter (in.):	0.244	Calibration Date:	Nov/95
Probe I.D.:	T1-7	Pitot Coefficient:	0.788 HB	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): _____ 0_2 (%): _____ CO (ppm): _____ Other: _____

Impinger 1 (g)	190.7	Assumed H_2O (%):	14
Impinger 2 (g)	53.7	Filter I.D. #:	5123A
Impinger 3 (g)	13.5	Net Filter Wt. (g):	
Impinger 4 (g)	2.6	Net Probe Wash Wt. (g):	
Impinger 5 (g)	0.4	Imp. Residue Wt. (g):	
Impinger 6 (g)	1.7		
XAD-2 Trap (g)	10.6		
Total H_2O Condensed (g)	273.2		

Sampling Comments: _____

Process Rate: _____

Control Equipment Operation: ESP

Process Comments: AG Reagent + Hi-L AC - intermediate temp (350)

Signature: _____ Date: 95 11 21

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	R & R
Date:	95-11-21	Test:	TO-MP-B
Sample Location:	Stack B	Filter I.D.:	2102505 - 1723A
Pre Weights by:	KP	Post Weights by:	JH

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	660.1	469.4	190.7
2	5% HNO_3 10% H_2O_2	637.8	584.1	53.7
3	5% HNO_3 10% H_2O_2	626.2	612.7	13.5
4	Blank	495.5	492.9	2.6
5	$KMnO_4$	580.8	580.4	0.4
6	$KMnO_4$	601.7	600.0	1.7
7	SG	793.8	783.2	10.6
8				
XAD Trap				
			Total (g)	273.2

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights	295.	295.1	✓	JH

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.22

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BOVAR-CONCORD Environmental

DATE: 95 / 11 / 21 SAMPLING TRAINS DATA SHEET (entered)

Client: [illegible] Project #: 541065 Sample Location: B Stack Operators: JW/JM

Run #: T9-MP-B Traverse #: 1 Traverse Direction: IN Start Time: 15:39 Finish Time: 16:39

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.53	1.05		577.777	330	233	265	52	NA	76	75	1.0
1	3		0.53	1.05	579.609	579.55	331	232	261	50		79	75	1.0
2	6		0.62	1.4	*581.382	581.30	334	231	258	50		80	76	1.0
2	9		0.64	1.4	583.281	583.28	338	232	262	48		82	76	1.0
3	12		.88	1.8	*585.292	585.24	351	232	258	48		82	76	1.0
3	15		1.0	2.1	587.60	587.58	357	231	256	47		83	77	1.0
4	18		1.1	2.15	*590.090	590.09	361	231	263	46		84	77	1.0
4	21		1.3	2.3	592.730	592.61	369	230	259	46		84	78	1.0
5	24		1.0	2.1	*595.480	595.39	371	231	259	46		85	78	1.0
5	27		0.90	1.8	597.906	597.85	367	231	260	46		85	79	1.0
6	30		0.93	2.0	*600.201	600.08	367	232	260	48		85	79	1.0
6	33		0.69	1.5	602.47	602.5	367	232	261	48		86	79	1.0
7	36		0.67	1.4	*604.558	604.60	367	233	262	48		85	80	1.0

Pre test leak check: Rate (cfm) .000 at 17 inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

Post test leak check: Rate (cfm) .007 at 15 inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

K value calculated by: ______ Checked by: ______ Operator Signature: [signature]

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BOVAR-CONCORD Environmental

DATE: 05/11/21 SAMPLING TRAINS DATA SHEET PAGE 3 OF 5

Client: Rio Tinto Project #: 54162605 Sample Location: B Stack Operators: JW/SM

Run #: T9-MP-B Traverse #: 1 Traverse Direction: ON Start Time: 15:39 Finish Time: 16:39

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	39		0.68	1.35	606.628	606.60	366	233	258	48	NA	85	80	1.0
8	42		0.74	1.4	+608.643	608.71	366	231	258	47		86	80	1.0
8	45		.78	1.4	610.842	610.80	366	230	258	48		86	80	1.0
9	48		0.75	1.4	+612.989	613.07	366	230	261	49		86	81	1.0
9	51		0.65	1.3	615.216	615.21	361	229	262	49		86	81	1.0
10	54		0.65	1.3	+617.208	617.17	360	229	261	49		86	81	1.0
10	57		0.60	1.2	619.089	619.06	357	229	259	49		86	81	1.0
10	60				620.479									

Pre test leak check: Rate (cfm) .006 at 17 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .002 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: JW

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BOVAR-CONCORD Environmental

AHB

DATE: 95/11/21 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: RioTRico Project #: 5416265 Sample Location: B Stack Operators: JW/JM

Run #: T9-MP-B Traverse #: 2 Traverse Direction: OUT Start Time: 16:57 Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.62	1.40		623.063	350	232	261	49	NA	82	81	1.0
1	3		0.70	1.55	625.044	625.09	351	233	260	46		82	81	1.0
2	6		0.77	1.7	*627.195	627.20	352	234	262	46		86	81	1.0
2	9		0.78	1.65	629.408	629.41	352	235	260	47		87	81	1.0
3	12		0.89	1.7	*631.632	631.65	354	234	261	47		87	82	1.0
3	15		0.89	1.75	633.956	633.88	356	235	259	49		87	82	1.0
4	18		1.0	2.2	*636.254	636.22	359	235	260	49		88	82	1.0
4	21		1.0	2.2	638.736	638.69	362	236	261	49		88	83	1.0
5	24		1.0	2.2	*641.206	641.18	364	235	260	50		88	83	1.0
5	27		1.1	2.2	643.696	643.61	365	235	259	50		88	83	1.0
6	30		1.2	2.2	*646.25	646.19	370	235	261	51		88	83	1.0
6	33		1.1	2.15	648.947	648.86	371	234	258	51		84	84	1.0
7	36		0.85	1.7	*651.459	651.40	366	234	257	52		89	84	1.0

Pre test leak check: Rate (cfm) .008 at 19 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .007 at 17 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 95 / 11 / 21

SAMPLING TRAINS DATA SHEET

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: SW/JR

Run #: T9-mP-B Traverse #: 2 Traverse Direction: OUT Start Time: 16:57 Finish Time: 17:57

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	39		0.78	1.6	653.685	653.61	365	233	257	53	NA	89	84	1.0
8	42		0.75	1.5	*655.799	655.71	343	233	259	53		89	84	1.0
8	45		0.71	1.45	657.856	657.79	361	234	258	53		89	84	1.0
9	48		0.71	1.5	*659.878	659.80	359	234	255	54		89	84	1.0
9	51		0.73	1.55	661.92	661.88	359	233	258	54		88	84	1.0
10	54		0.67	1.4	*664.03	664.00	357	233	258	54		88	84	1.0
10	57		0.67	1.4	666.059	666.00	356	232	257	54		88	84	1.0
10	60				668.059	668.024								

Pre test leak check: Rate (cfm) .008 at 19 inches Hg (Vacuum) Leak Volume Start: ________ Leak Volume End: ________

Post test leak check: Rate (cfm) .008 at 17 inches Hg (Vacuum) Leak Volume Start: ________ Leak Volume End: ________

K value calculated by: ________ Checked by: ________ Operator Signature: [signature]

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BOVAR-CONCORD Environmental

QA/QC CHECKLIST

PROJECT # 5416265 DATE: 951121 TEST T9-MP-B

Client: Rio Rijo Location: B Stack Operator: JW

Sample Type: M5 Reference Method: EPA M29

Modifications:

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	----	
Static positive or negative	----	Neg.
Average Temperature	----	
Estimate % H_2O	----	14
How estimated?	----	M4
Estimate Gas Composition	----	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	----	Cem
Proper nozzle selected?	✓	(used .244 nozzle, ~~[illegible]~~
K factor	----	150 sheets for .250 nozzle used)
Number of sampling points per traverse	----	10
Probe markings correct?	✓	
Time per point	----	6
Number of readings per point	----	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other		watch
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or		
Quartz	✓	
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or		
Quartz or	✓	
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5411C265 DATE: 951121 TEST BTS-MP-B

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	---	
Connected to:	✓	
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre		
Quartz	✓	
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	✓	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol		
Thermocouple attached to trap		
XAD-2 Trap covered with foil at all times		

QA/QC CHECKLIST

PROJECT # 5416265 DATE: 95121 TEST TG-MP-8

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	7	
Contents #1		MT
#2		Nitric
#3		Nitric
#4		MT
#5		Perm.
#6		Perm.
Impinger weights recorded	✓	S.G
Impingers properly assembled	✓	
Recirculating pump set up properly		
Modifications		
Grease used on joints	✓	
Silica gel type		
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate		.000 cfm@ 17 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	NA	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel		great
Leak checks at port changes Before		.007 cfm@ 15 "Hg
After		.008 cfm@ 19 "Hg
Final leak race acceptable		.007 cfm@ 17 "Hg
General comments on sampling technique		
Sample recovery performed on-site?		
Sample recovery performed by		JA
Clean-up area - General Environment		
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 541626.5 DATE: 55121 TEST TS-MP-B

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	⟷	teflon
Leak free	✓	
Petri Dishes: borosilicate glass		
plastic	✓	
Balance Type	⟷	
Calibrated or QC checked	⟷	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		good pink/blue.
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		
Colour of Filter		
Foil Wrapped?		
Probe Rinses		
Acetone	✓	
Other		
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents		
Solvents		
Resin		
Blank Train		
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: STACK B TEST #: T9-MP-B DATE: 95-11-21 PROJECT NO.: 5416265

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	Container TS3 Front Half 0.1 N HNO3 Rinse Final Wt.: 401.6 Initial Wt.: 263.5 Gain: 138.1 Comments:	Brush loose particulate onto filter	Container TS4-1 Impinger 4 Contents Final Wt.: 635.5 Initial Wt.: 263.2 Gain: 372.3	Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse Final Wt.: ~~508~~ 503.8 Initial Wt.: 263.1 Gain: 240.7 Colour: CLEAR	Rinse with 100 mL 0.1 N HNO3	Rinse 3x with 100 mL Acidified KMnO4	Place rinsing in Container 5C which contains 200 mL of water	
Container TS2 Front Half Acetone Rinse Final Wt.: 322.5 Initial Wt.: 263.2 Gain: 59.3 Comments:		Filter TS2 Seal petri dish with tape Colour: LIGHT GREY-GREEN Filter #: 5123A ZENON # 102505 probe wash may contain part (tiny) of filter			Container TSA Impinger 4 Contents Final Wt.: 359.7 Initial Wt.: 263.0 Gain: 96.7	Rinse with 100 mL water	Container 5C HCL Rinse Final Wt.: 475.4 Initial Wt.: 262.9 Gain: 213 Colour: CLEAR - PURPLE	
						Container 5B Impinger 5 & 6 KMnO4 Content and Rinses Final Wt.: 730.9 Initial Wt.: 263.1 Gain: 467.8 Colour: PURPLE		

Train Identification		Blanks
Train No.:		
HNO3 / H2O2 Batch No.:	Container 9	200 mLs
DI Water Batch No.:	Container 8B	100 mLs
Acetone Batch No.:	Container 7	100 mLs
0.1 N HNO3 Batch No.:	Container 8A	300 mLs
Acidified KMnO4 Batch No.:	Container 10	100 mLs
8 N HCl / Batch No.: DI Water	Container 11	25 mL / 200 mL
Filter Number:	Container 12	* _____

Mark Liquid Level on Containers
Seal and Label Containers
Reagent Blanks Submitted? Yes ✓ No ____
Prepare Fresh Acidified KMnO4 Daily _____

NOVEMBER 22, 1995

Bar 29.49 in Hg

METHOD 26
HCl SAMPLING DATA FORM

TIME ON 12:17

Company Name	IRON COUNTY	Plant Location	LANSON UTAH	Source Name	STACK 6
Test Date	NOV 22/95	Test Number	TM-HCl-A	Job Number	5416285
Sampling for	HCl	Meter Box	Y/1.001	B.P. mm/inHg	803 mbar

ABSORBING SOL'N	15 ml 0.1 N H_2SO_4	15 ml 0.1 N H_2SO_4	15 ml 0.1 N NaOH	15 ml 0.1 N NaOH	Silica Gel	GAS	1	2	3	4
WEIGHTS	IMP 1	IMP 2	IMP 3	IMP 4	IMP 5	READINGS				
EMPTY						O2				
FILLED FINAL						CO2				
FILLED INITIAL						CO				
DIFFERENCE						TIME				

OPERATOR	HCl	Sample Rate (Lpm)	~2	H20 Condensed	
Lk.Chk, (Init.)	0 cc/min	Lk. Chk. (Final)	.08 cc/min	Probe Purged	(Yes) No)

Sample Time	Clock Time	Volume m^3/L Desired	Volume m^3/L Actual	Vacuum in.Hg	Meter Temp. °C/°F	Probe Temp. °C/°F	Box Temp. °C/°F	Impinger Temp. °C/°F
0	0		1163.3	1	77	294	234	
10	5		1173.65	1	77.5	263	245	
20	10		1184.15	1	79	309	250	
30	15		1194.3	1	79	257	258	
40	20		1204.5	1	83	295	263	
50	25		1214.6	1	83.5	275	267	
60	30		1224.65	1	84	296	268	
70	35		12348	1	81.5	273	268	
80	40		1245.0	1	80.5	302	266	
90	45		1255.1	1	79.5	252	264	
100	50		1265.3	1	80	268	264	
110	55		1275.5	1	83	345	263	
120	60		1285.75	1	81	297	262	
			122.45	1	80.65	286	259	

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4.323 cubic

TIME OFF 13:17

BOVAR-CONCORD Environmental

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	BER
Date:	95-11-22	Test:	TH-HCl-A
Sample Location:	Stack B	Filter I.D.:	~~NA~~
Pre Weights by:	JA	Post Weights by:	N.L.

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	93.2	86.0	7.2 ✓
2	0.1N H_2SO_4	104.4	96.2	8.2 ✓
3	0.1N H_2SO_4	107.2	106.6	.6 ✓
4	Blank	71.2	71	.2 ✓
5	0.1N NaOH	99.6	99.2	.4 ✓
6	0.1N NaOH	97.5	97.2	.3 ✓
7	S.G.	123.4	122.5	.9 ✓
8				
XAD Trap				
			Total (g)	17.9 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights	295.	295.1	—	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.22

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BOVAR-CONCORD Environmental

HCl METHOD 26 SAMPLING TRAIN
RECOVERY DATA FORM

PROJECT NO.: 5716265

LOCATION: Stack 5 TEST #: TIL-HCL-A DATE: 11-22/95

Impingers 1 and 2
Weigh impingers Empty contents into container and rinse with DI water

Impingers 3 and 4
Weigh impingers Empty contents into container and rinse with DI water

Container TS1 Impingers 1 and 2 0.1 N H2SO4 Contents and DI Water Rinses	
Final Wt.:	124.4
Initial Wt.:	24.4
Gain:	100.0

Container TS2 Impingers 3 and 4 0.1 N NaOH Contents and DI Water Rinses	
Final Wt.:	122.0
Initial Wt.:	22.0
Gain:	100.0

Mark Liquid Level ✓

Seal and Label ✓

Train Identification	
Train No.:	
0.1 N H2SO4 Batch No.:	Zenon
DI Water Batch No.:	Zenon
0.1 N NaOH Batch No.:	
Train Loaded By:	JA
Recovered By:	NL
Reagent Blank Submitted: Yes ✓	No ____

SYSTEM CALIBRATION AND DRIFT CALCULATIONS

CLIENT	RIGO+RIGO	DATE	NOV22/95
PROJECT NUMBER	5416265	TIME START	09:02
SAMPLE LOCATION	STACK	TIME FINISH	11:53
	TEST NUMBER	T10CEMA	

INSTRUMENT SPAN VALUES

OXYGEN	25	%	CARBON DIOXIDE	20	%
SULPHUR DIOXIDE	1000	PPM	CARBON MONOXIDE	1000	PPM
NITROGEN OXIDES	1000	PPM	TOTAL HYDROCARBO	100	PPM

			INITIAL VALUES		FINAL VALUES		
ITEM	CAL.GAS VALUE	ANAL. CAL.	SYSTEM CAL.	SYSTEM CAL. BIAS (% SPAN)	SYSTEM CAL.	SYSTEM CAL. BIAS (% SPAN)	DRIFT (% SPAN)
O2 ZERO	0	0	0	0.0	0.03	0.1	0.1
O2 CAL	9.91	9.94	9.87	-0.3	9.88	-0.2	0.0
SO2 ZERO	0	0.9	0.2	-0.1	2.3	0.1	0.2
SO2 SPAN	149	151	147	-0.4	146	-0.5	-0.1
NOX ZERO	0	1.01	1.2	0.0	1.2	0.0	0.0
NOX SPAN	302	304	3.05	-30.1	307	0.3	30.4
CO2 ZERO	0	0.05	0.06	0.1	0.08	0.2	0.1
CO2 SPAN	7.01	7.04	7.02	-0.1	6.97	-0.4	-0.3
CO ZERO	0	1.1	1.1	0.0	1.1	0.0	0.0
CO SPAN	100	101	101	0.0	100.4	-0.1	-0.1
THC ZERO	0	0.4	0.6	0.2	1.7	1.3	1.1
THC SPAN	20.1	21.7	21.6	-0.1	23.5	1.8	1.9

DRIFT CRITERIA <5% SPAN
BIAS CRITERIA <5% SPAN

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.22.95
RUN : T10-OC-A
LOC. : STACK B

RUN TIME : 9:14 TO 11:42

ORGANICS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
ORGANICS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	1.6930 DSm3	59.783 DScf
AVERAGE ISOKINETICITY	100.9 %	

FLUE GAS CHARACTERISTICS

MOISTURE		16.89 %	
TEMPERATURE		146.4 deg C	295.6 deg F
FLOW		45350 DSm3/hr	26692 DScfm
		90206 Am3/hr	53094 Acfm
VELOCITY		17.60 m/s	3465.5 fpm
GAS ANALYSIS	O2	11.00 %	
	CO2	9.30 %	
	CO	0.00 %	
	SO2	0.00 %	
	MOL. WT.	30.04 g/gmole D.B.	
	MOL. WT.	28.01 g/gmole W.B.	

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.22.95
RUN : T10-OC-A
LOC. : STACK B

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.4 kPa	25.50 in.Hg
STATIC PRESSURE	-117.0 Pa	-0.47 in.H2O
NOZZLE DIAMETER	5.79 mm	0.2280 in.
PITOT COEFFICIENT	0.796	
METER CORRECTION FACTOR	0.983	

CONDENSATE COLLECTION

RESIN TRAP CONDENSATE	2.1 g
CONDENSATION IN IMPINGER 1	233.5 g
CONDENSATION IN IMPINGER 2	0.9 g
CONDENSATION IN IMPINGER 3	1.0 g
CONDENSATION IN IMPINGER 4	0.9 g
SILICA GEL WEIGHT GAIN	14.7 g
TOTAL MOISTURE GAIN	253.1 g

ORGANICS COLLECTION

FILTER ORGANICS	0.0000 mg
WASHINGS ORGANICS	0.0000 mg
RESIN ORGANICS	0.0000 mg
IMPINGER ORGANICS	0.0000 mg
TOTAL ORGANICS	0.0000 mg

TOTAL SAMPLING TIME	120.0 min.

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.22.95
RUN : T10-OC-A
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1													
1	0.0	309	0.400	0.49	30.05	75	0	260	43	55	3.0	1.0	95.8
1	3.0	308	0.400	0.50	31.33	76	0	248	43	49	5.0	1.0	96.3
2	6.0	310	0.550	0.75	32.62	77	0	247	44	48	5.5	2.0	101.4
2	9.0	303	0.450	0.69	34.21	78	0	248	44	46	5.0	2.0	135.8
3	12.0	307	0.600	0.82	36.15	78	248	248	45	46	6.0	3.0	80.2
3	15.0	308	0.630	0.88	37.47	79	247	247	45	46	6.0	3.0	96.1
4	18.0	305	0.500	0.70	39.09	80	247	247	46	46	6.0	4.0	97.4
4	21.0	303	0.500	0.72	40.56	80	248	247	46	46	6.0	4.0	99.9
5	24.0	308	0.500	0.72	42.07	80	247	246	46	46	6.0	5.0	103.6
5	27.0	300	0.590	0.79	43.63	80	248	246	47	47	6.0	5.0	102.2
6	30.0	298	0.580	0.77	45.31	81	246	247	48	48	6.0	6.0	102.1
6	33.0	298	0.850	1.35	46.98	81	247	247	48	48	8.0	6.0	95.6
7	36.0	296	0.750	1.20	48.87	82	248	246	49	50	7.5	7.0	99.3
7	39.0	295	0.850	1.40	50.72	82	248	246	50	50	8.0	7.0	100.8
8	42.0	296	0.830	1.35	52.72	82	248	248	52	50	8.0	8.0	101.0
8	45.0	293	0.830	1.35	54.70	83	248	249	54	51	8.0	8.0	101.7
9	48.0	295	0.920	1.50	56.70	83	248	247	54	49	9.0	9.0	101.6
9	51.0	285	0.600	0.92	58.80	83	247	248	55	48	6.5	9.0	103.4
10	54.0	283	0.650	0.93	60.54	83	248	248	56	48	7.0	10.0	100.3
10	57.0	282	0.460	0.69	62.30	83	248	249	56	49	6.0	10.0	104.9
	60.0				63.85								
TRAVERSE NO. 2													
1	0.0	292	0.720	1.15	64.24	82	246	247	47	53	8.0	1.0	103.2
1	3.0	292	0.690	1.00	66.13	82	245	248	47	49	7.0	1.0	99.7
2	6.0	291	0.690	1.00	67.92	83	245	247	47	48	7.0	2.0	98.9
2	9.0	290	0.690	1.00	69.70	84	246	247	48	48	7.0	2.0	99.9
3	12.0	290	0.800	1.30	71.50	84	246	247	48	48	8.0	3.0	99.6
3	15.0	290	0.740	1.20	73.43	85	246	247	49	49	8.0	3.0	102.8
4	18.0	290	0.760	1.20	75.35	85	248	249	48	50	8.0	4.0	100.9
4	21.0	290	0.810	1.30	77.26	85	247	248	47	50	8.0	4.0	100.8
5	24.0	288	0.720	1.15	79.23	85	247	247	48	51	8.0	5.0	102.4
5	27.0	289	0.800	1.30	81.12	85	248	247	49	52	8.0	5.0	101.4
6	30.0	290	0.800	1.30	83.09	85	248	248	49	53	8.0	6.0	100.4
6	33.0	291	0.850	1.40	85.04	84	246	247	49	53	8.5	6.0	103.1
7	36.0	294	0.920	1.45	87.10	84	247	247	50	54	9.0	7.0	103.7

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.22.95
RUN : T10-OC-A
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	295	0.850	1.30	89.25	84	247	248	50	54	8.0	7.0	99.4
8	42.0	295	0.820	1.25	91.23	84	248	247	51	54	8.0	8.0	98.6
8	45.0	298	0.900	1.40	93.16	84	248	248	49	53	8.0	8.0	98.2
9	48.0	297	0.770	1.25	95.17	84	247	248	50	52	8.0	9.0	101.3
9	51.0	296	0.700	1.00	97.09	84	247	249	52	52	8.0	9.0	101.1
10	54.0	292	0.550	0.75	98.92	84	247	247	53	52	6.0	10.0	99.4
10	57.0	291	0.600	0.84	100.52	83	247	249	54	53	7.0	10.0	101.3
	60.0				102.22								
		296	0.682	1.05		82	222	248	49	50	7.1		100.9

ISOKINETIC TEST DATA FORM

Sample Type: ORGANICS Reference Method: EPA M23 Page 1 of 5

Client:	RIGO & RIGO	City, Province:	LAYTON, UTAH
Project Number:	5416265	Test Number:	TIO-OCA
Sample Location:	B STACK	Date:	NOV. 22/95
Start Time:	9:14	Finish Time:	11:42
Barometric Press. (in Hg):	25.5	Stack Press(in H_2O): + or -:	-0.47
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes (No)

Sample Box Number:	T1	Gas Meter Factor:	0.983	Calibration Date:	SEPT. 19/95
Nozzle I.D.:	T1-2	Nozzle Diameter (in.):	0.228	Calibration Date:	NOV. 16/95
Probe I.D.:	T2-7	Pitot Coefficient:	0.796	Calibration Date:	SEPT/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%):	9.3	O_2 (%):	~~10.7~~ 11 HRS
CO (ppm):	—	Other:	—

Impinger 1 (g)	233.5	Assumed H_2O (%):	14
Impinger 2 (g)	0.9	Filter I.D. #:	—
Impinger 3 (g)	1.0	Net Filter Wt. (g):	—
Impinger 4 (g)	0.9	Net Probe Wash Wt. (g):	—
Impinger 5 (g)	14.7	Imp. Residue Wt. (g):	—
~~Impinger 6 (g)~~ CONDENSER	1.0		
XAD-2 Trap (g)	1.1		
Total H_2O Condensed (g)	253.1		

Sampling Comments: Train OS
Trap #5

Process Rate: _____

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: NOV. 22/95

MOISTURE ANALYSIS DATA SHEET

Project #:	5411625	Client:	RIGGS RIGG
Date:	NOV. 21/95	Test:	TIO - CCA
Sample Location:	B STACK	Filter I.D.:	—
Pre Weights by:	JMH	Post Weights by:	JMH

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g) 487.3	Net Condensate (g)
1 *	MT	720.8	~~487.9~~	233.5 ✓
2	RODI H_2O	613.3	612.4	0.9 ✓
3	RODI H_2O	621.1	620.1	1.0 ✓
4	MT	421.9	421.0	0.9 ✓
5	SILICA GEL	762.8	748.1	14.7 ✓
6				
7				
8 CONDENSER		250.3	249.3	1.0 ✓
XAD Trap		254.8	253.7	1.1 ✓
			Total (g)	253.1 ✓

* WEIGHED WITH PLASTIC ~~BAG~~ ON BOTTOM.

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	149.5	147.6	✓	JMH
Post weights	147.5	147.6	✓	JMH

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: TRAIN 05
TRAIN 05 TRAP

JMH

Signature:

Nov. 21/95

Date:

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BOVAR-CONCORD Environmental

DATE: 2/11/95 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: RIGOL RIGO Project #: 5416265 Sample Location: B STACK Operators: JM/JM

Run #: T10-OCA Traverse #: 1 Traverse Direction: NORTH Start Time: 9:14 Finish Time: —

Pt. (Tail Water)	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.40	0.49	—	~~424.45~~ 430.05	309	245	260	55	43	75	75	3.0
	3		0.40	0.50	431.42	431.33	308	246	248	49	43	77	75	5.0
2	6		0.55	0.75	432.70	432.62	310	246	247	48	44	78	75	5.5
	9		0.45	0.69	434.22	434.21	303	246	248	46	44	79	76	5.0
3	12		0.60	0.82	436.22	436.15	307	246	248	46	45	80	76	6.0
	15		0.63	0.88	437.83	437.47	308	248	247	46	45	81	76	6.0
4	18		0.50	~~0.70~~ 0.71	439.20	439.09	305	247	247	46	46	82	77	6.0
	21		0.50	0.72	~~440.66~~ 440.62	440.56	303	247	247	46	46	82	77	6.0
5	24		0.50	0.72	442.09	442.07	308	248	246	46	46	82	77	6.0
	27		0.59	0.79	443.60	443.63	300	247	246	47	47	82	77	6.0
6	30		0.58	0.77	445.29	445.31	298	248	247	48	48	83	78	6.0
	33		0.85	1.35	446.96	446.98	298	246	247	48	48	83	78	8.0

Pre test leak check: Rate (cfm) ~~0.000~~ 0.008 at 15 inches Hg (Vacuum) Leak Volume Start: 429.20 Leak Volume End: ~~424.45~~ 430.05

Post test leak check: Rate (cfm) — at — inches Hg (Vacuum) Leak Volume Start: — Leak Volume End: —

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 22 / 11 / 95 | SAMPLING TRAINS DATA SHEET | PAGE 3 OF 5

Client: R160 ; R160 | Project #: 5416265 | Sample Location: B STACK | Operators: TM/FM

Run #: T10 OCA | Traverse #: 1 | Traverse Direction: NORTH | Start Time: / | Finish Time: 10:14

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.75	1.20	448.97	448.87	296	247	246	50	49	84	79	7.5
	39		0.85	1.40	450.74	450.72	295	248	246	50	50	84	79	8.0
8	42		0.83	1.35	452.71	452.72	296	248	248	50	52	85	79	8.0
	45		0.83	1.35	454.69	454.70	293	248	249	51	54	85	80	8.0
9	48		0.92	1.50	456.67	456.70	295	248	247	49	54	85	80	9.0
	51		0.60	0.92	458.78	458.80	285	248	248	48	55	85	80	6.5
10	54		0.65	0.93	460.48	460.54	283	247	248	48	56	85	80	7.0
	57		0.46	0.69	462.28	462.30	282	248	249	49	56	85	80	6.0
	60				463.77	463.85								

Pre test leak check: Rate (cfm) / at / inches Hg (Vacuum) | Leak Volume Start: / | Leak Volume End: /

Post test leak check: Rate (cfm) 0.010 at 15 inches Hg (Vacuum) | Leak Volume Start: 463.85 | Leak Volume End: 464.04

K value calculated by: _____ | Checked by: _____ | Operator Signature: _____

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DATE: 2/11/95 SAMPLING TRAINS DATA SHEET

Client: RIGO 5 RIGO Project #: 5416265 Sample Location: B STACK Operators: JM/JM

Run #: T10-OLA Traverse #: 2 Traverse Direction: EAST Start Time: 10:42 Finish Time: /

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		0.72	1.15	/	464.24	292	246	247	53	47	82	81	8.0
	3		0.69	1.00	466.08	466.13	292	245	248	49	47	83	81	7.0
2	6		0.69	1.00	467.93	467.92	291	245	247	48	47	85	81	7.0
	9		0.69	1.00	469.73	469.70	290	246	247	48	48	85	82	7.0
3	12		0.80	1.30	471.50	471.50	290	246	245	48	48	86	81	8.0
	15		0.74	1.20	473.44	473.43	290	246	249	49	49	87	82	8.0
4	18		0.76	1.20	475.29	475.34	290	248	248	50	48	87	82	8.0
	21		0.81	1.30	477.23	477.26	290	247	247	50	47	87	82	8.0
5	24		0.72	1.15	479.21	479.23	288	247	247	51	48	87	82	8.0
	27		0.80	1.30	481.07	481.12	289	248	248	52	49	87	82	8.0
6	30		0.80	1.30	483.06	483.09	290	248	247	53	49	87	82	8.0
	33		0.85	1.40	485.02	485.04	291	246	247	53	49	86	82	8.5

Pre test leak check: Rate (cfm) 0.011 at 15 inches Hg (Vacuum) Leak Volume Start: 464.04 Leak Volume End: 464.24

Post test leak check: Rate (cfm) / at / inches Hg (Vacuum) Leak Volume Start: / Leak Volume End: /

K value calculated by: _____ Checked by: _____ Operator Signature: _____

E:\FORMS\STDS.FRM

DATE: 12/11/95 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: RIGO - RIGO Project #: 541626.5 Sample Location: B STACK Operators: JM/JM

Run #: T10 - OC A Traverse #: 2 Traverse Direction: EAST Start Time: — Finish Time: 11:42

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.92	1.45	487.03	487.10	294	247	248	54	50	86	81	9.0
	39		0.85	1.30	489.18	489.25	295	247	247	54	50	86	81	8.0
8	42		0.82	1.25	491.24	491.23	295	248	248	54	51	86	82	8.0
	45		0.90	1.40	493.19	493.16	298	248	248	53	49	86	82	8.0
9	48		0.77	1.25	495.21	495.17	297	247	249	52	50	86	82	8.0
	51		0.70	1.00	497.07	497.09	296	247	247	52	52	86	82	8.0
10	54		0.55	0.75	498.90	498.92	292	247	249	52	53	86	82	6.0
	57		0.60	0.84	500.52	500.52	291	247	249	53	54	85	81	7.0
	60				502.20	502.22								

Pre test leak check: Rate (cfm) — at — inches Hg (Vacuum) Leak Volume Start: — Leak Volume End: —

Post test leak check: Rate (cfm) 0.010 at 15 inches Hg (Vacuum) Leak Volume Start: 502.22 Leak Volume End: 502.40

K value calculated by: _____ Checked by: _____ Operator Signature: _____

1.42

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BOVAR-CONCORD Environmental

PROJECT # 5116265 DATE: NOV. 22/95 TEST TO - OCA

Client: RIGG: RIGG Location: B STACK Operator: JM/JM

Sample Type: ORGANICS Reference Method: EPA M23

Modifications: RECOVER FOLLOWING ENVIRONMENT CANADA PROTOCOL WITH TRAIN RINSE WITH ACETONE/DCM ; PROBE RINSE WITH TOLUENE.

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?		
Avg. ΔP	⟷	
Static positive or negative	⟷	-0.47
Average Temperature	⟷	300 °F
Estimate % H_2O	⟷	
How estimated?	⟷	
Estimate Gas Composition	⟷	O_2% ___ CO_2(%) ___ CO(ppm) ___
How Estimated?	⟷	
Proper nozzle selected?	✓	
K factor	⟷	
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?	✓	
Mercury		
Aneroid		
Other	✓	WATCH
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	PROBE RINSE
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5416.2.5 DATE: NOV. 22/95 TEST TIC - CX_A

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	⟷	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type	K	
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 5416265 DATE: NOV 22/95 TEST TIO OCA

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	EMPTY
#2	⟷	REDI H2O
#3	⟷	REDI H2O
#4	⟷	EMPTY
#5	⟷	SILICA GEL
#6	⟷	—
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	⟷	
Grease used on joints	X	
Silica gel type	⟷	
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate	⟷	0.007 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run		
Any particulate lost during filter change		
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	
Leak checks at port changes Before	⟷	0.010 cfm@ 15 "Hg
After	⟷	0.011 cfm@ 15 "Hg
Final leak race acceptable	⟷	cfm@ "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	RBJA
Clean-up area - General Environment	⟷	CLEAN HMB
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 5416265 DATE: Nov. 22/95 TEST T10 - CCA

ITEM	✓	COMMENTS
Teflon		
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass		
Polyethylene		
Cap Material	⟷	
Leak free		
Petri Dishes: borosilicate glass		
plastic		
Balance Type	⟷	
Calibrated or QC checked	⟷	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently		
Probe and sample train openings covered		
Silica Gel		
Condition/Colour		
Weighed		
Filter Handling		
Tweezers used?	✓	
Condition?		Good
Colour of Filter		White.
Foil Wrapped?		Yes.
Probe Rinses		
Acetone / DCM	✓	
~~Other~~ Toluene	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: B- Stack TEST #: T10-OCA DATE: Nov 22/95 PROJECT NO.: 541-626

Nozzle, Probe Liner Front Half Filter Holder	Filter	Back Half Filter Holder and Condenser Coil	XAD Resin	Impingers & ~~HPLC~~ Rinse	Back Half Rinse
All Equipment		All equipment		RODL	
DCM Wash and brush 3x each with ~~hexane~~ and acetone. Rinse 3x with with ~~hexane~~ and and acetone.	Remove and place on pre-cleaned foil fold in half and place in ~~petri dish~~. Ziploc bag	**Weigh Coil & Record Weight** ~~Soak 5 minutes each with hexane and acetone. Rinse 3x with hexane and acetone.~~ Toluene Rinse	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into container. ~~Rinse 3x with HPLC water.~~	Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone

DCM **Container ~~TS1~~ TS2 Front Half Acetone ~~Hexane~~ Rinse**		**Container ~~TS2~~ TS1 Filter**		**Container TS3 Back Half Filter and Condenser Coil**		**Container TS4 XAD Resin**		**Container TS5 Impinger Contents**		**Container TS6 Back Half Rinse**	
Final Wt.:	455.9	Filter ID:	T10-OCA	Final Wt.:	458.2	**Wrap in Foil**		Final Wt.:	958.9	Final Wt.:	
Initial Wt.:	265.7	Colour:	White	Initial Wt.:	266.8	XAD:	046621	Initial Wt.:	265.1	Initial Wt.:	
Gain:	220.2			Gain:	191.4	Colour:	White	Gain:	493.8	Gain:	
				Colour:	Clear	Train 5		Colour:	Clear	Colour:	

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	05
RODL ~~HPLC~~ Batch No.:	Zenon 95/10/26
Acetone Batch No.:	Caledon 14123
DCM ~~Hexane~~ Batch No.:	Caledon 16700
Filter Batch No.:	Zenon 95/10/24 XAD No.: 046621
Train Assembled By:	JD
Train Recovered By:	PB

Reagent Blanks Collected?	Yes
Combined Acetone/~~Hexane~~ DCM	Yes
~~Combined Glycol~~/Water	Yes
Blank Train Collected?	Yes
Comments:	One of the 'U' tubes had silicone grease.

EPSREC.DRW-May 95

BOVAR-CONCORD Environmental

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 22
RUN : T10-MP-A
LOC. : B STACK

RUN TIME : 9:14 TO 11:45

METALS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
METALS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	2.0021 DSm3	70.697 DScf
AVERAGE ISOKINETICITY	98.7 %	

FLUE GAS CHARACTERISTICS

MOISTURE	16.77 %	
TEMPERATURE	146.8 deg C	296.3 deg F
FLOW	47840 DSm3/hr	28158 DScfm
	95115 Am3/hr	55983 Acfm
VELOCITY	18.56 m/s	3654.0 fpm

GAS ANALYSIS	O2	11.00 %
	CO2	9.30 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.04 g/gmole D.B.
	MOL. WT.	28.02 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 22
RUN : T10-MP-A
LOC. : B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.4 kPa	25.50 in.Hg
STATIC PRESSURE	-127.0 Pa	-0.51 in.H2O
NOZZLE DIAMETER	6.20 mm	0.2440 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	208.5 g
CONDENSATION IN IMPINGER 2	65.1 g
CONDENSATION IN IMPINGER 3	8.0 g
CONDENSATION IN IMPINGER 4	0.9 g
CONDENSATION IN IMPINGER 5	0.2 g
CONDENSATION IN IMPINGER 6	0.0 g
SILICA GEL WEIGHT GAIN	14.0 g
TOTAL MOISTURE GAIN	296.7 g

METALS COLLECTION

FILTER METALS	0.0000 mg
WASHINGS METALS	0.0000 mg
IMPINGER METALS	0.0000 mg
TOTAL METALS	0.0000 mg

TOTAL SAMPLING TIME 120.0 min.

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 22
RUN : T10-MP-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	316	0.860	1.75	669.31	73	232	257	50	1.0	1.0	104.5
1	3.0	316	0.820	1.65	671.58	74	233	257	42	1.0	1.0	104.0
2	6.0	314	0.910	1.75	673.79	75	235	257	42	1.0	2.0	99.8
2	9.0	308	0.630	1.30	676.03	76	235	255	41	1.0	2.0	103.0
3	12.0	307	0.850	1.65	677.97	77	235	259	42	1.0	3.0	97.7
3	15.0	308	0.950	1.75	680.11	78	234	256	43	1.0	3.0	98.8
4	18.0	304	0.780	1.55	682.40	79	234	256	43	1.0	4.0	101.0
4	21.0	302	0.840	1.65	684.53	80	235	257	43	1.0	4.0	98.4
5	24.0	300	0.750	1.50	686.69	80	235	257	44	1.0	5.0	101.1
5	27.0	300	0.850	1.65	688.79	80	235	258	44	1.0	5.0	58.7
6	30.0	298	0.850	1.65	690.09	81	235	255	43	1.0	6.0	131.2
6	33.0	299	0.880	1.65	693.00	81	234	255	43	1.0	6.0	101.9
7	36.0	296	0.780	1.50	695.30	82	234	255	44	1.0	7.0	100.3
7	39.0	296	0.880	1.65	697.44	82	235	258	45	1.0	7.0	95.3
8	42.0	297	0.830	1.60	699.60	82	235	257	45	1.0	8.0	96.8
8	45.0	296	0.880	1.70	701.73	82	235	259	45	1.0	8.0	99.3
9	48.0	299	0.950	1.75	703.98	83	236	258	45	1.0	9.0	96.5
9	51.0	299	0.830	1.60	706.25	83	236	258	44	1.0	9.0	97.7
10	54.0	299	0.950	1.75	708.40	84	236	257	45	1.0	10.0	99.3
10	57.0	301	0.750	1.50	710.74	84	236	256	45	1.0	10.0	98.9
	60.0				712.81							
TRAVERSE NO. 2												
1	0.0	295	0.520	1.00	713.55	82	232	255	47	1.0	1.0	100.9
1	3.0	290	0.510	1.00	715.31	83	232	254	44	1.0	1.0	99.5
2	6.0	272	0.600	1.10	717.04	84	232	0	43	1.0	2.0	93.2
2	9.0	276	0.680	1.20	718.82	84	232	255	42	1.0	2.0	93.2
3	12.0	280	0.780	1.40	720.71	85	233	255	42	1.0	3.0	97.3
3	15.0	283	0.780	1.40	722.82	85	233	254	42	1.0	3.0	97.9
4	18.0	286	0.860	1.60	724.94	86	233	256	42	1.0	4.0	97.8
4	21.0	287	0.750	1.40	727.16	86	233	253	42	1.0	4.0	97.6
5	24.0	288	0.880	1.70	729.23	87	234	253	42	1.0	5.0	97.1
5	27.0	289	0.870	1.75	731.46	87	234	254	43	1.0	5.0	93.8
6	30.0	291	0.920	1.95	733.60	87	234	255	43	1.0	6.0	99.5
6	33.0	294	0.980	2.00	735.93	87	234	256	42	1.0	6.0	110.7
7	36.0	296	0.650	1.25	738.60	87	234	254	43	1.0	7.0	95.6

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 22
RUN : T10-MP-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	296	0.600	1.10	740.48	87	235	257	44	1.0	7.0	88.9
8	42.0	299	0.620	1.20	742.16	86	235	256	45	1.0	8.0	97.1
8	45.0	299	0.590	1.20	744.02	86	235	256	45	1.0	8.0	100.7
9	48.0	296	0.550	1.10	745.90	87	235	257	45	1.0	9.0	102.3
9	51.0	294	0.550	1.10	747.75	87	234	256	44	1.0	9.0	100.5
10	54.0	292	0.480	0.95	749.57	87	231	256	44	1.0	10.0	100.8
10	57.0	292	0.480	0.95	751.28	87	231	256	44	1.0	10.0	101.9
	60.0				753.01							
		296	0.754	1.47		83	234	250	44	1.0		98.7

ISOKINETIC TEST DATA FORM

Sample Type: MS Reference Method: EPA M29 Page 1 of 5

Client:	Rio+Rio	City, Province:	Layton, Utah
Project Number:	5416765	Test Number:	TIO-MP-A
Sample Location:	B Stack	Date:	951122
Start Time:	9:14	Finish Time:	11:45
Barometric Press. (in Hg):	25.5 "Hg	Stack Press(in H_2O): + or -:	-.51
Stack Diameter (in.):	53	Length x Width:	____ x ____
Stack Height (ft):	116	Cyclonic Flow:	Yes ____ No ✓

Sample Box Number:	T3	Gas Meter Factor:	1.006	Calibration Date:	Sept/95
Nozzle I.D.:	Q2	Nozzle Diameter (in.):	0.244	Calibration Date:	Nov/95
Probe I.D.:	T1-7'	Pitot Coefficient:	~~.798~~	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): ____ 0_2 (%): ____ CO (ppm): ____ Other: ____

Impinger 1 (g)	208.5	Assumed H_2O (%):	16
Impinger 2 (g)	65.1	Filter I.D. #:	(5254)
Impinger 3 (g)	8.0	Net Filter Wt. (g):	____
Impinger 4 (g)	0.9	Net Probe Wash Wt. (g):	____
Impinger 5 (g)	0.2	Imp. Residue Wt. (g):	____
Impinger 6 (g)	0		
XAD-2 Trap (g) SG.	14.0 ✓		
Total H_2O Condensed (g)	~~281.6~~ 296.7		

Sampling Comments: _____

Process Rate: AG Reagent + High AC Minimum 300F

Control Equipment Operation: ESP.

Process Comments: _____

Signature: _____ Date: 95 11 22

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	R & R
Date:	95-11-22	Test:	T10-MP-A
Sample Location:	Stack 5	Filter I.D.:	5258 102506
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	708.6	500.1	208.5
2	5% HNO_3 10% Hydr	630.5	565.4	65.1
3	5% HNO_3 10% H_2O_2	624.2	616.2	8.0
4	Blank	491.3	490.4	0.9
5	$KMnO_4$	592.6	592.4	0.2
6	$KMnO_4$	604.7	604.7	0
7	SG	776.0	762.0	14.0
8				
XAD Trap				2016.7 g
			Total (g)	~~2816~~

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	295	295.2	✓	JA
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95-11-22

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BOVAR-CONCORD Environmental

DATE: 95/11/22 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Rizo + Rizo Project #: 54116265 Sample Location: B Stack Operators: SW/JM

Run #: TO-MP-A Traverse #: 1 Traverse Direction: IN Start Time: 9:14 Finish Time: 10:04

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		0.86	1.75		669.310	316	232	257	50	NA	73	72	1.0
1	3		0.82	1.65	671.500	671.58	316	233	257	42		75	72	1.0
2	6		0.91	1.75	673.718	673.79	314	235	257	42		77	72	1.0
2	9		0.63	1.3	676.042	676.03	308	235	255	41		79	73	1.0
3	12		0.85	1.65	677.904	677.97	307	235	259	42		80	74	1.0
3	15		0.95	1.75	680.147	680.11	308	234	256	43		82	74	1.0
4	18		0.78	1.55	682.449	682.40	304	234	256	43		82	75	1.0
4	21		0.84	1.65	684.579	684.53	302	235	257	43		83	76	1.0
5	24		0.75	1.5	686.729	686.69	300	235	257	44		83	76	1.0
5	27		0.85	1.65	688.768	688.79	300	235	258	44		83	77	1.0
6	30		0.85	1.65	691.002	690.09	298	235	255	43		84	77	1.0
6	33		0.88	1.65	692.302	693.00	299	234	255	43		84	78	1.0
7	36		0.78	1.5	695.251	695.30	296	234	255	44		85	79	1.0

Pre test leak check: Rate (cfm) .009 at 16 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .009 at 19 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 9/11/22 SAMPLING TRAINS DATA SHEET PAGE 3 OF 5

Client: Rio Tinto Project #: 541626S Sample Location: B Stack Operators: JW/JM

Run #: TIO-MP-A Traverse #: 1 Traverse Direction: ON Start Time: 9:14 Finish Time: 10:14

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F) NA	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	39		0.88	1.6	697.419	697.44	296	235	258	45		85	79	1.0
8	42		0.83	1.6	*699.691	699.60	297	235	257	45		85	79	1.0
8	45		0.88	1.7	701.786	701.73	296	235	259	45		85	79	1.0
9	48		0.95	1.75	*703.981	703.98	299	234	258	45		86	80	1.0
9	51		0.83	1.6	706.319	706.25	299	236	258	44		86	80	1.0
10	54		0.95	1.75	*708.436	708.40	299	236	257	45		86	81	1.0
10	57		0.75	1.5	710.739	710.74	301	236	256	45		87	81	1.0
10	60				712.819	712.811								

Pre test leak check: Rate (cfm) .009 at 16 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .009 at 19 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 9/11/22 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Rizo Rizo Project #: 5416265 Sample Location: B Stack Operators: JW/JM

Run #: TO-MP-A Traverse #: 2 Traverse Direction: IN Start Time: 10:45 Finish Time: 11:45

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		052	1.0		713.551	295	232	255	47	NA	82	81	1.0
1	3		0.51	1.0	715.282	715.31	290	232	254	44		85	81	1.0
2	6		0.60	1.1	*717.024	717.04	272	232	254	43		86	81	1.0
2	9		0.68	1.2	718.895	718.82	276	232	255	42		86	82	1.0
3	12		0.78	1.4	*720.799	720.71	280	233	255	42		87	82	1.0
3	15		0.78	1.4	722.849	722.82	283	233	254	42		88	82	1.0
4	18		0.86	1.6	*724.939	724.94	286	233	256	42		88	83	1.0
4	21		0.75	1.4	727.165	727.16	287	233	253	42		89	83	1.0
5	24		0.88	1.7	*729.28	729.23	288	234	253	42		89	84	1.0
5	27		0.87	1.75	731.481	731.46	286	234	254	43		89	84	1.0
6	30		0.92	1.95	*733.668	733.60	291	234	255	43		89	84	1.0
6	33		0.98	2.0	735.902	735.93	294	234	256	42		89	84	1.0
7	36		0.65	1.25	*738.306	738.6	296	234	259	43		89	84	1.0

Pre test leak check: Rate (cfm) .010 at 22 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .008 at 22 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 8/11/22 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rayo Frijo Project #: 5416265 Sample Location: B Stack Operators: JW/JM

Run #: 710-MP-A Traverse #: 2 Traverse Direction: IN Start Time: 10:45 Finish Time: 16:45

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
									257	44	NA	89	84	
7	39		0.60	1.1	740.535	740.48	296	235	257	44		89	84	1.0
8	42		0.62	1.2	*742.339	742.16	299	235	256	45		88	84	1.0
8	45		0.59	1.2	744.046	744.02	299	235	256	45		88	84	1.0
9	48		0.55	1.1	*745.863	745.90	296	235	257	45		89	84	1.0
9	51		0.55	1.00	747.680	747.75	294	234	256	44		89	84	1.0
10	54		0.48	0.95	*749.53	749.57	292	231	256	44		89	85	1.0
10	57		0.48	0.95	751.233	751.28	292	231	256	44		89	85	1.0
10	60				752.943	753.007								

Pre test leak check: Rate (cfm) .010 at 22 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .008 at 22 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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Static -.51

BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: 11 22 TEST T10-M1-A

Client: Riso+Lyon Location: B Stack Operator: JW/JM

Sample Type: MS Reference Method: EPA M29

Modifications: _____

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟿	
Static positive or negative	⟿	neg.
Average Temperature	⟿	
Estimate % H_2O	⟿	16
How estimated?	⟿	
Estimate Gas Composition	⟿	O_2% ___ CO_2(%) ___ CO(ppm) ___
How Estimated?	⟿	
Proper nozzle selected?		
K factor	⟿	
Number of sampling points per traverse	⟿ ✓	10
Probe markings correct?	✓	
Time per point	⟿	6
Number of readings per point	⟿	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other		watch
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or		
Quartz	✓	
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or		
Quartz or	✓	
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5416265 DATE: 951122 TEST T10MP-A

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	⟷	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple		
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol		
FILTER TYPE		
Glass Fibre		
Quartz	✓	
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	✓	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol	NA	
Thermocouple attached to trap		
XAD-2 Trap covered with foil at all times		

PROJECT # 5916265 DATE: 951122 TEST T10-MP-A

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	7	
Contents #1		
#2		
#3		
#4		
#5		
#6		
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly		
Modifications		
Grease used on joints	✓	
Silica gel type		
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate		.009 cfm@ 10 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	NA	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel		
Leak checks at port changes Before		.009 cfm@ 19 "Hg
After		.010 cfm@ 22 "Hg
Final leak race acceptable		.008 cfm@ 22 "Hg
General comments on sampling technique		
Sample recovery performed on-site?		
Sample recovery performed by		
Clean-up area - General Environment		
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 5416265 DATE: 5/11/22 TEST TO-MP-A

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	✓	teflon
Leak free		
Petri Dishes: borosilicate glass		
plastic	✓	
Balance Type	✓	digital toploader.
Calibrated or QC checked	✓	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		blue
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?	✓	
Colour of Filter	✓	
Foil Wrapped?		PETRI
Probe Rinses		
Acetone	✓	
Other	✓	0.1N HNO_3
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	—	
Blank Train	—	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: Stack B TEST #: T10-MP-A DATE: 95-11-22 PROJECT NO.: 5416265

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	**Container TS3 Front Half 0.1 N HNO3 Rinse** Final Wt.: 425.3 Initial Wt.: 188.0 Gain: 237.3 Comments:	Brush loose particulate onto filter	**Container TS4-1 Impinger 4 Contents** Final Wt.: 756.8 Initial Wt.: 263.0 Gain: 493.8	**Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse** Final Wt.: 459.5 Initial Wt.: 222.5 Gain: 237.0 Colour: CLEAR	Rinse with 100 mL 0.1 N HNO3	Rinse 3x with 100 mL Acidified KMnO4	Place rinsing in Container 5C which contains 200 mL of water	
Container TS2 Front Half Acetone Rinse Final Wt.: 275.5 Initial Wt.: 188.2 Gain: 187.3 Comments:		**Filter TS2** Seal petri dish with tape Colour: BARELY NOTICABLE Filter #: 5258			**Container TSA Impinger 4 Contents** Final Wt.: 320 Initial Wt.: 188.8 Gain: 132	Rinse with 100 mL water	**Container 5C HCL Rinse** Final Wt.: 792.9 Initial Wt.: 263.3 Gain: 529.1 Colour: CLEAR PURPLY	
						Container 5B Impinger 5 & 6 KMnO4 Content and Rinses Final Wt.: 735.7 Initial Wt.: 262.7 Gain: 473.0 Colour: PURPLE		

Train Identification	Blanks
Train No.:	
HNO3 / H2O2 Batch No.:	Container 9 200 mLs
DI Water Batch No.:	Container 8B 100 mLs
Acetone Batch No.:	Container 7 100 mLs
0.1 N HNO3 Batch No.:	Container 8A 300 mLs
Acidified KMnO4 Batch No.:	Container 10 100 mLs
8 N HCl / Batch No.: DI Water	Container 11 25 mL / 200 mL
Filter Number:	Container 12 * _____

Mark Liquid Level on Containers
Seal and Label Containers
Reagent Blanks Submitted? Yes ✓ No ____
Prepare Fresh Acidified KMnO4 Daily ✓

METHOD 26
HCl SAMPLING DATA FORM

Company Name	[illegible]	Plant Location	[illegible]	Source Name	Stack B
Test Date	9/4/22 M5	Test Number	T12-HCl-B	Job Number	5416265
Sampling for	HCl	Meter Box	[illegible]	B.P. mm/inHg	862 mbar

ABSORBING SOL'N	15 ml 0.1 N H_2SO_4	15 ml 0.1 N H_2SO_4	15 ml 0.1 N NaOH	15 ml 0.1 N NaOH	Silica Gel	GAS	1	2	3	4
WEIGHTS	IMP 1	IMP 2	IMP 3	IMP 4	IMP 5	READINGS				
EMPTY						O2				
FILLED FINAL						CO2				
FILLED INITIAL						CO				
DIFFERENCE						TIME				

OPERATOR		Sample Rate (Lpm)		H20 Condensed	
Lk.Chk, (Init.)	0 cc/min	Lk. Chk. (Final)	0 cc/min	Probe Purged	(Yes) No)

Sample Time	Clock Time	Volume m^3 Desired	Volume m^3 Actual	Vacuum in.Hg	Meter Temp. °C/°F	Probe Temp. °C/°F	Box Temp. °C/°F	Impinger Temp. °C/°F
0	0		1312.9	1	54.5	298	249	
10	5		1313.9	1	55	264	260	
20	10		1335.1	1	54.5	294	266	
30	15		1345.1	1	54	244	269	
40	20		1355.0	1	56.5	311	271	
50	25		1364.9	1	57	248	274	
60	30		1374.8	1	59	279	260	
70	35		1384.7	1	59	252	257	
80	40		1395.2	1	59.5	258	245	
90	45		1405.1	1	63	331	244	
100	50		1415.25	1	59.5	260	243	
110	55		1425.6	1	62	306	246	
120	60		1435.7	1	60.5	297	247	
		AVG/TOT	122.85	1	58	280	256	

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TIME ON : 17:22 TIME OFF : 18:22

4.323 ft³ P_{bar} 25.5 in Hg

HD

BOVAR-CONCORD Environmental

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	Rig of Rags
Date:	11-22-95	Test:	TB-HCL-B
Sample Location:	Stack	Filter I.D.:	NA
Pre Weights by:	N.L	Post Weights by:	JM

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	93.3	86.2	7.1 ✓
2	0.1N H_2SO_4	101.2	93.9	7.3 ✓
3	0.1N H_2SO_4	105.0	104.7	0.3 ✓
4	Blank	71.3	71.1	0.2 ✓
5	0.1N NaOH	99.7	99.6	0.1 ✓
6	0.1N NaOH	98.9	98.7	0.2 ✓
7	S.G.	124.2	123.3	0.9 ✓
8				
XAD Trap				
			Total (g)	160 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95·11·23

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BOVAR-CONCORD Environmental

HCl METHOD 26 SAMPLING TRAIN
RECOVERY DATA FORM

PROJECT NO.: 5416265

LOCATION: Stack B TEST #: T12HCl6 DATE: 95-11-22

Impingers 1 and 2	Impingers 3 and 4
Weigh impingers Empty contents into container and rinse with DI water	Weigh impingers Empty contents into container and rinse with DI water

Container TS1 Impingers 1 and 2 0.1 N H2SO4 Contents and DI Water Rinses	Container TS2 Impingers 3 and 4 0.1 N NaOH Contents and DI Water Rinses
Final Wt.: 129.2	Final Wt.:
Initial Wt.: 29.2	Initial Wt.: 29.0
Gain: 100.0	Gain:

with ferrule

Mark Liquid Level ✓	Seal and Label ✓

Train Identification	
Train No.:	
0.1 N H2SO4 Batch No.:	Teva
DI Water Batch No.:	Teva
0.1 N NaOH Batch No.:	Teva
Train Loaded By:	JNL
Recovered By:	JM
Reagent Blank Submitted: Yes ✓	No ____

SYSTEM CALIBRATION AND DRIFT CALCULATIONS

CLIENT	RIGO+RIGO	DATE	NOV22/95
PROJECT NUMBER	5416265	TIME START	12:50
SAMPLE LOCATION	STACK	TIME FINISH	17:22
	TEST NUMBER	T11CEMB	

INSTRUMENT SPAN VALUES

OXYGEN	25	%	CARBON DIOXIDE	20	%
SULPHUR DIOXIDE	1000	PPM	CARBON MONOXIDE	1000	PPM
NITROGEN OXIDES	1000	PPM	TOTAL HYDROCARBONS	100	PPM

			INITIAL VALUES		FINAL VALUES		
ITEM	CAL.GAS VALUE	ANAL. CAL.	SYSTEM CAL.	SYSTEM CAL. BIAS (% SPAN)	SYSTEM CAL.	SYSTEM CAL. BIAS (% SPAN)	DRIFT (% SPAN)
O2 ZERO	0	0.03	0.03	0.0	0.23	0.8	0.8
O2 CAL	9.91	9.91	9.88	-0.1	10.01	0.4	0.5
SO2 ZERO	0	0.5	2.3	0.2	2.7	0.2	0.0
SO2 SPAN	149	149	146	-0.3	145	-0.4	-0.1
NOX ZERO	0	0.6	1.2	0.1	0.4	-0.0	-0.1
NOX SPAN	302	306	307	0.1	304	-0.2	-0.3
CO2 ZERO	0	0.05	0.08	0.2	0.13	0.4	0.3
CO2 SPAN	7.01	6.98	6.97	-0.1	7.1	0.6	0.7
CO ZERO	0	0.5	1.1	0.1	1.1	0.1	0.0
CO SPAN	100	100.6	100.4	-0.0	99.5	-0.1	-0.1
THC ZERO	0	1.73	1.7	-0.0	0.75	-1.0	-1.0
THC SPAN	20.1	23.7	23.5	-0.2	22.1	-1.6	-1.4

DRIFT CRITERIA <5% SPAN
BIAS CRITERIA <5% SPAN

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.22.95
RUN : T11-OC-B
LOC. : STACK B

RUN TIME : 14:08 TO 16:39

ORGANICS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
ORGANICS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	1.7072 DSm3	60.282 DScf
AVERAGE ISOKINETICITY	100.0 %	

FLUE GAS CHARACTERISTICS

MOISTURE	16.69 %	
TEMPERATURE	142.3 deg C	288.2 deg F
FLOW	46096 DSm3/hr	27131 DScfm
	90572 Am3/hr	53309 Acfm
VELOCITY	17.68 m/s	3479.5 fpm

GAS ANALYSIS	O2	10.68 %
	CO2	9.47 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.06 g/gmole D.B.
	MOL. WT.	28.04 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.22.95
RUN : T11-OC-B
LOC. : STACK B

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.4 kPa	25.50 in.Hg
STATIC PRESSURE	-117.0 Pa	-0.47 in.H2O
NOZZLE DIAMETER	5.79 mm	0.2280 in.
PITOT COEFFICIENT	0.796	
METER CORRECTION FACTOR	0.983	

CONDENSATE COLLECTION

RESIN TRAP CONDENSATE	2.2 g
CONDENSATION IN IMPINGER 1	231.1 g
CONDENSATION IN IMPINGER 2	1.2 g
CONDENSATION IN IMPINGER 3	0.1 g
CONDENSATION IN IMPINGER 4	1.3 g
SILICA GEL WEIGHT GAIN	15.7 g
TOTAL MOISTURE GAIN	251.6 g

ORGANICS COLLECTION

FILTER ORGANICS	0.0000 mg
WASHINGS ORGANICS	0.0000 mg
RESIN ORGANICS	0.0000 mg
IMPINGER ORGANICS	0.0000 mg
TOTAL ORGANICS	0.0000 mg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.22.95
RUN : T11-OC-B
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1													
1	0.0	263	0.460	0.69	502.81	76	245	245	52	54	6.0	1.0	100.7
1	3.0	262	0.400	0.49	504.30	77	245	245	44	42	5.5	1.0	98.1
2	6.0	265	0.500	0.72	505.66	78	246	245	44	42	7.5	2.0	97.5
2	9.0	265	0.500	0.72	507.17	79	246	245	44	41	7.5	2.0	100.7
3	12.0	265	0.460	0.69	508.73	79	248	246	45	41	7.0	3.0	102.2
3	15.0	263	0.410	0.50	510.25	80	246	246	46	41	5.5	3.0	90.9
4	18.0	267	0.550	0.78	511.53	79	247	246	45	41	8.0	4.0	99.1
4	21.0	271	0.600	0.93	513.14	80	247	247	45	42	9.0	4.0	103.3
5	24.0	274	0.590	0.86	514.89	80	247	247	46	42	8.0	5.0	99.0
5	27.0	286	0.620	0.92	516.55	81	247	245	47	43	9.0	5.0	101.4
6	30.0	280	0.600	0.89	518.28	81	248	245	47	43	8.5	6.0	100.8
6	33.0	273	0.720	1.05	519.98	81	248	247	48	44	10.0	6.0	99.2
7	36.0	299	0.700	1.00	521.82	81	246	245	48	44	9.5	7.0	100.6
7	39.0	273	0.770	1.10	523.63	81	247	245	48	45	10.0	7.0	97.0
8	42.0	296	0.800	1.30	525.49	81	248	245	49	45	10.5	8.0	100.9
8	45.0	274	0.780	1.20	527.43	81	247	245	49	46	10.5	8.0	100.5
9	48.0	276	0.620	0.89	529.37	81	246	246	50	46	8.5	9.0	98.3
9	51.0	265	0.620	0.89	531.06	81	247	246	51	46	8.5	9.0	98.1
10	54.0	265	0.490	0.72	532.76	81	247	248	53	47	7.5	10.0	99.3
10	57.0	262	0.470	0.69	534.29	81	246	247	53	46	7.5	10.0	99.2
	60.0				535.79								
TRAVERSE NO. 2													
1	0.0	290	0.620	0.89	536.24	79	246	246	49	53	9.0	1.0	101.4
1	3.0	304	0.780	1.20	537.96	80	246	247	44	47	10.0	1.0	100.1
2	6.0	310	0.900	1.40	539.85	81	248	247	44	47	11.0	2.0	101.9
2	9.0	307	0.770	1.15	541.91	81	246	247	43	46	10.0	2.0	101.9
3	12.0	305	0.740	1.10	543.82	81	247	247	43	47	10.0	3.0	103.2
3	15.0	308	0.950	1.50	545.72	81	246	247	44	48	11.0	3.0	99.5
4	18.0	309	0.950	1.50	547.79	80	247	247	44	50	12.0	4.0	102.2
4	21.0	309	0.890	1.40	549.91	81	247	247	43	50	11.5	4.0	102.3
5	24.0	311	1.000	1.65	551.97	81	247	245	43	51	12.5	5.0	103.3
5	27.0	313	1.050	1.65	554.17	81	247	247	43	52	12.5	5.0	102.3
6	30.0	298	0.850	1.30	556.40	81	246	247	43	53	11.0	6.0	99.9
6	33.0	285	0.780	1.20	558.38	80	247	247	43	51	11.0	6.0	98.8
7	36.0	278	0.820	1.25	560.27	80	246	246	43	49	10.0	7.0	97.0

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.22.95
RUN : T11-OC-B
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	312	0.980	1.55	562.18	81	246	247	44	47	12.0	7.0	100.6
8	42.0	314	0.900	1.40	564.30	81	247	247	44	45	11.5	8.0	101.6
8	45.0	310	0.720	1.05	566.35	81	248	248	44	44	9.5	8.0	99.9
9	48.0	307	0.710	1.05	568.16	81	248	247	44	43	9.0	9.0	100.4
9	51.0	307	0.840	1.30	569.97	82	247	248	45	43	10.0	9.0	98.9
10	54.0	304	0.690	1.00	571.91	81	247	247	46	42	9.0	10.0	99.4
10	57.0	301	0.650	0.97	573.68	81	248	247	47	42	9.0	10.0	100.5
	60.0				575.42								
		288	0.696	1.06		80	247	246	46	46	9.4		100.0

ISOKINETIC TEST DATA FORM

Sample Type: ORGANICS Reference Method: EPA M23 Page 1 of 5

Client:	RIGZ : RIGS	City, Province:	LAYTON, UTAH
Project Number:	5416265	Test Number:	TIL-OCB
Sample Location:	B STACK	Date:	NOV. 22/95
Start Time:	14:08	Finish Time:	16.39
Barometric Press. (in Hg):	25.5	Stack Press(in H_2O): + or -:	-0.47
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes (No)

Sample Box Number:	T1	Gas Meter Factor:	0.983	Calibration Date:	SEPT. 19/95
Nozzle I.D.:	T1-2	Nozzle Diameter (in.):	0.228	Calibration Date:	NOV. 16/95
Probe I.D.:	T2-7	Pitot Coefficient:	0.796	Calibration Date:	SEPT. 95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): 9.4 O_2 (%): 10.6 ✓ CO (ppm): _____ Other: _____

Impinger 1 (g)	231.1 ✓	Assumed H_2O (%):	—
Impinger 2 (g)	1.2 ✓	Filter I.D. #:	—
Impinger 3 (g)	0.1 ✓	Net Filter Wt. (g):	—
Impinger 4 (g)	1.3 ✓	Net Probe Wash Wt. (g):	—
~~Impinger 5 (g)~~ SILICA GEL	15.7 ✓	Imp. Residue Wt. (g):	—
~~Impinger 6 (g)~~ CONDENSER	0.9 ✓		
XAD-2 Trap (g)	1.3 ✓		
Total H_2O Condensed (g)	251.6 ✓		

Sampling Comments: Train 07
Trap 04662B

Process Rate: _____

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: NOV. 22/95

MOISTURE ANALYSIS DATA SHEET

Project #:	541626.5	Client:	RIGO & RIGO
Date:	NOV. 22/95	Test:	TI-OC-3
Sample Location:	PA STACK	Filter I.D.:	
Pre Weights by:	JMC	Post Weights by:	JMC

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	EMPTY	713.6	482.5	231.1 ✓
2	RoDi H_2O	609.8	608.6	1.2 ✓
3	RoDi H_2O	596.5	596.4	0.1 ✓
4	EMPTY	426.2	424.9	1.3 ✓
5	SILICA GEL	778.5	762.8	15.7 ✓
6				
7				
~~CONDENSER~~ 8		242.7	241.8	0.9 ✓
XAD Trap		249.5	248.2	1.3 ✓
			Total (g)	251.6 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	147.5	147.6	✓	
Post weights	147.5	147.6	✓	

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: TRAIN 07
TRAP TRAIN 07

Signature:

Date: NOV 22/95

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BOVAR-CONCORD Environmental

DATE: 22 / 11 / 95 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: RIGO i RIGO Project #: 5416265 Sample Location: B STACK Operators: JM/JM

Run #: 111-OC B Traverse #: 1 Traverse Direction: NORTH Start Time: 14:08 Finish Time: /

Pt. FNR WALL	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.46	0.69	/	502.81	263	245	245	54	52	76	75	6.0
	3		0.40	0.49	504.28	504.30	262	245	245	42	44	78	76	5.5
2	6		0.50	0.72	505.67	505.66	265	246	245	42	44	79	77	7.5
	9		0.50	0.72	507.19	507.17	265	246	245	41	44	80	77	7.5
3	12		0.46	0.69	508.70	508.73	265	248	246	41	45	80	77	7.0
	15		0.41	0.50	510.20	510.25	263	246	246	41	46	81	78	5.5
4	18		0.55	0.78	511.63	511.53	267	247	246	41	45	81	77	8.0
	21		0.60	0.93	513.13	513.14	271	247	247	42	45	82	78	9.0
5	24		0.59	0.86	514.82	514.89	274	247	247	42	46	82	78	8.0
	27		0.62	0.92	516.55	516.55	286	247	245	43	47	83	78	9.0
6	30		0.60	0.89	518.25	518.28	280	248	245	43	47	83	78	8.5
	33		0.72	1.05	519.96	519.98	273	248	247	44	48	83	78	10.0

Pre test leak check: Rate (cfm) 0.008 at 15 inches Hg (Vacuum) Leak Volume Start: 502.40 Leak Volume End: 502.81

Post test leak check: Rate (cfm) / at / inches Hg (Vacuum) Leak Volume Start: / Leak Volume End: /

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 22/11/95 SAMPLING TRAINS DATA SHEET PAGE 3 OF 5

Client: RIGO : RIGO Project #: 5416265 Sample Location: B STACK Operators: JM/JM

Run #: T11-OC-B Traverse #: 1 Traverse Direction: NORTH Start Time: / Finish Time: 15:08

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.70	1.00	521.82	521.82	299	246	245	44	48	83	79	9.5
	39		0.77	1.10	523.63	523.63	273	247	245	45	48	83	78	10.0
8	42		0.80	1.30	525.53	525.49	296	248	245	45	49	83	78	10.5
	45		0.78	1.20	527.42	527.43	274	247	245	46	49	83	79	10.5
9	48		0.62	0.89	529.34	529.37	276	246	246	46	50	83	79	8.5
	51		0.62	0.89	531.07	531.06	265	247	246	46	51	83	79	8.5
10	54		0.49	0.72	532.76	532.76	265	247	248	47	53	83	79	7.5
	57		0.47	0.69	534.27	534.29	262	246	247	46	53	83	79	7.5
	60				535.77	535.79								

Pre test leak check: Rate (cfm) / at / inches Hg (Vacuum) Leak Volume Start: / Leak Volume End: /

Post test leak check: Rate (cfm) 0.014 at 15 inches Hg (Vacuum) Leak Volume Start: 535.79 Leak Volume End: 535.99

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 12 / 11 / 95 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: RIGO 1 RIGO Project #: 5416265 Sample Location: B STACK Operators: JM/JM

Run #: T11-0CB Traverse #: 2 Traverse Direction: EAST Start Time: 15:39 Finish Time: /

Pt. FAR WALL	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.62	0.89	/	536.24	290	246	246	53	49	79	78	9.0
	3		0.78	1.20	537.94	537.96	304	246	247	47	44	81	79	10.0
2	6		0.90	1.40	539.87	539.85	310	248	247	47	44	82	79	11.0
	9		0.77	1.15	541.90	541.91	307	246	247	46	43	82	79	10.0
3	12		0.74	1.10	543.81	543.82	305	247	247	47	43	82	79	10.0
	15		0.95	1.50	545.68	545.72	308	246	247	48	44	83	79	11.0
4	18		0.95	1.50	547.83	547.79	309	247	247	50	44	82	78	12.0
	21		0.89	1.40	549.90	549.91	309	247	247	50	43	83	79	11.5
5	24		1.00	1.65	551.95	551.97	311	247	245	51	43	83	79	12.5
	27		1.05	1.65	554.13	554.17	313	247	247	52	43	83	79	12.5
6	30		0.85	1.30	556.39	556.40	298	246	247	53	43	83	79	11.0
	33		0.78	1.20	558.39	558.38	285	247	247	51	43	82	78	11.0

Pre test leak check: Rate (cfm) .011 at 15 inches Hg (Vacuum) Leak Volume Start: 536.991 Leak Volume End: 536.244

Post test leak check: Rate (cfm) / at / inches Hg (Vacuum) Leak Volume Start: / Leak Volume End: /

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 22/11/95 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: RIGO & RIGO Project #: 5416265 Sample Location: B STACK Operators: JM/JL

Run #: T11-OCB Traverse #: 2 Traverse Direction: EAST Start Time: / Finish Time: 16:39

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.82	1.25	560.29	560.27	278	246	246	49	43	82	78	10.0
	39		0.98	1.55	562.23	562.18	312	246	247	47	44	83	79	12.0
8	42		0.90	1.40	564.32	564.30	314	247	247	45	44	83	79	11.5
	45		0.72	1.05	566.35	566.35	310	248	248	44	44	83	79	9.5
9	48		0.71	1.05	568.19	568.16	307	248	247	43	44	83	79	9.0
	51		0.84	1.30	570.01	569.97	307	247	248	43	45	84	80	10.0
10	54		0.69	1.00	571.95	571.91	304	247	247	42	46	83	79	9.0
	57		0.65	0.97	573.71	573.68	301	248	247	42	47	83	79	9.0
	60				575.42	575.42								

Pre test leak check: Rate (cfm) / at / inches Hg (Vacuum) Leak Volume Start: / Leak Volume End: /

Post test leak check: Rate (cfm) 0.012 at 15 inches Hg (Vacuum) Leak Volume Start: 575.42 Leak Volume End: 575.59

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: Nov. 22/95 TEST TII-OCB

Client: RIGO. RIGO Location: B STACK Operator: STM / JM

Sample Type: ORGANICS Reference Method: EPA M23

Modifications: RECOVERY FOLLOWING ENVIRONMENT CANADA PROCEDURES WITH TRAIN RINSE WITH ACETONE/DCM & PROBING RINSE WITH TOLUENE.

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?		
Avg. ΔP	⟷	
Static positive or negative	⟷	-0.47
Average Temperature	⟷	295 F
Estimate % H_2O	⟷	
How estimated?	⟷	
Estimate Gas Composition	⟷	O_2% ___ CO_2(%) ___ CO(ppm) ___
How Estimated?	⟷	
Proper nozzle selected?	✓	
K factor	⟷	
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?	✓	
Mercury		
Aneroid		
Other	✓	WATCH
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5416665 DATE: Nov. 22/95 TEST ~~Test~~ TH-OCB

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	⟷	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type	K	
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol		
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 546665 DATE: Nov. 22/95 TEST TH-CCB

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	EMPTY
#2	⟷	RODI H_2O
#3	⟷	RODI H_2O
#4	⟷	EMPTY
#5	⟷	SILICA GEL
#6	⟷	—
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	⟷	
Grease used on joints	X	
Silica gel type	⟷	
New?		
Used?	✓	10% SPENT
Pre Test Leak Check		
Performed	✓	
Rate	⟷	0.002 cfm@ 15 "Hg
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	
Leak checks at port changes Before	⟷	0.014 cfm@ 15 "Hg
After	⟷	0.011 cfm@ 15 "Hg
Final leak race acceptable	⟷	0.012 cfm@ 15 "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?		
Sample recovery performed by	⟷	
Clean-up area - General Environment	⟷	CLEAN LAB
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 541626S DATE: Nov 24/95 TEST TI-COB

ITEM	✓	COMMENTS
Teflon		
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass		
Polyethylene		
Cap Material	←→	
Leak free		
Petri Dishes: borosilicate glass		
plastic		
Balance Type	←→	
Calibrated or QC checked	←→	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently		
Probe and sample train openings covered		
Silica Gel		
Condition/Colour		
Weighed		
Filter Handling		
Tweezers used?	✓	
Condition?		Good
Colour of Filter		off white
Foil Wrapped?		yes
Probe Rinses		
Acetone DCM	✓	
Other Toluene	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

#12

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: B-Static TEST #: T11-OC-B DATE: Nov 22/95 PROJECT NO.: 541-6215

Nozzle, Probe Liner Front Half Filter Holder All Equipment	Filter	Back Half Filter Holder and Condenser Coil All equipment	XAD Resin	Impingers & ~~HPLC~~ Rinse RODS	Back Half Rinse
Wash and brush 3x each with ~~hexane~~ and acetone. Rinse 3x with with ~~hexane~~ and and acetone. DCM DCM	Remove and place on pre-cleaned foil fold in half and place in petri dish.	**Weigh Coil & Record Weight** ~~Soak 5 minutes each with hexane and acetone. Rinse 3x with hexane and acetone.~~ Toluene Rinse	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into container. ~~Rinse 3x with HPLC water~~ #4	Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone.

Container ~~TS1~~ TS2 Front Half Acetone ~~Hexane~~ Rinse	
Final Wt:	460.1
Initial Wt:	263.0
Gain:	197.1

DCM

Container ~~TS2~~ TS1 Filter	
Filter ID:	T11-OC-B
Colour:	Off white

Container TS3 Back Half Filter and Condenser Coil	
Final Wt:	458.3
Initial Wt:	263.0
Gain:	195.3
Colour:	Clear

Container TS4 XAD Resin

Wrap in Foil	
XAD:	096623
Colour:	white

Train 7

Container TS5 Impinger Contents	
Final Wt:	744.4
Initial Wt:	266.0
Gain:	478.4
Colour:	Clear

Container TS6 Back Half Rinse	
Final Wt:	
Initial Wt:	
Gain:	
Colour:	

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	07
~~HPLC~~ Batch No.: RODS	Zenon 95/10/26
Acetone Batch No.:	Caledon 14123
~~Hexane~~ Batch No.: DCM	Caledon 16700
Filter Batch No.:	Zenon 95/10/26 XAD No.: Train 7
Train Assembled By:	JD
Train Recovered By:	BB

Reagent Blanks Collected?	Yes
Combined Acetone/~~Hexane~~ DCM	Yes
~~Combined Glycol~~/Water	Yes
Blank Train Collected?	Yes
Comments:	

EPSREC.DRW-May 95

BOVAR-CONCORD Environmental

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO	DATE : 11.22.95
JOBSITE : LAYTON UTAH	RUN : T11-MP-B
REF.No. : 5416265	LOC. : STACK B

RUN TIME : 14:08 TO 16:39

METALS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
METALS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	2.0208 DSm3	71.358 DScf
AVERAGE ISOKINETICITY	100.3 %	

FLUE GAS CHARACTERISTICS

MOISTURE	17.21 %	
TEMPERATURE	151.1 deg C	304.0 deg F
FLOW	47512 DSm3/hr	27964 DScfm
	95933 Am3/hr	56464 Acfm
VELOCITY	18.72 m/s	3685.5 fpm

GAS ANALYSIS	O2	10.68 %
	CO2	9.47 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.06 g/gmole D.B.
	MOL. WT.	27.98 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.22.95
RUN : T11-MP-B
LOC. : STACK B

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.4 kPa	25.50 in.Hg
STATIC PRESSURE	-117.0 Pa	-0.47 in.H2O
NOZZLE DIAMETER	6.20 mm	0.2440 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	202.0 g
CONDENSATION IN IMPINGER 2	66.1 g
CONDENSATION IN IMPINGER 3	12.6 g
CONDENSATION IN IMPINGER 4	1.8 g
CONDENSATION IN IMPINGER 5+6	0.3 g
SILICA GEL WEIGHT GAIN	26.3 g
TOTAL MOISTURE GAIN	309.1 g

METALS COLLECTION

FILTER METALS	0.0000 mg
WASHINGS METALS	0.0000 mg
IMPINGER METALS	0.0000 mg
TOTAL METALS	0.0000 mg

TOTAL SAMPLING TIME 120.0 min.

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.22.95
RUN : T11-MP-B
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	303	0.820	1.80	754.18	75	234	255	44	1.0	1.0	105.7
1	3.0	302	0.680	1.50	756.44	78	234	259	39	1.0	1.0	108.2
2	6.0	302	0.770	1.50	758.56	78	234	256	38	1.0	2.0	100.6
2	9.0	301	0.710	1.40	760.66	80	234	255	37	1.0	2.0	99.9
3	12.0	300	0.730	1.40	762.67	80	234	254	36	1.0	3.0	97.5
3	15.0	297	0.640	1.25	764.66	80	233	254	37	1.0	3.0	99.1
4	18.0	299	0.870	1.80	766.56	81	234	255	39	1.0	4.0	100.4
4	21.0	309	1.000	2.15	768.80	82	235	258	40	1.0	4.0	104.3
5	24.0	307	1.000	2.10	771.28	82	235	257	40	1.0	5.0	102.3
5	27.0	310	1.000	2.10	773.72	83	236	257	42	1.0	5.0	101.6
6	30.0	312	0.970	2.00	776.14	83	235	258	43	1.0	6.0	104.6
6	33.0	307	0.760	1.45	778.59	83	234	258	44	1.0	6.0	101.1
7	36.0	309	0.720	1.40	780.70	83	234	258	45	1.0	7.0	99.6
7	39.0	301	0.780	1.45	782.72	84	234	258	44	1.0	7.0	97.9
8	42.0	303	0.870	1.80	784.80	84	233	256	44	1.0	8.0	99.7
8	45.0	304	0.830	1.70	787.03	84	233	258	44	1.0	8.0	102.9
9	48.0	304	0.800	1.60	789.28	84	233	255	45	1.0	9.0	100.6
9	51.0	301	0.830	1.70	791.44	85	234	258	45	1.0	9.0	99.9
10	54.0	302	0.730	1.35	793.63	85	235	255	45	1.0	10.0	99.6
10	57.0	3Q1	0.730	1.35	795.68	85	234	253	45	1.0	10.0	99.6
	60.0				797.73							
TRAVERSE NO. 2												
1	0.0	284	0.550	1.15	798.39	81	234	258	47	1.0	1.0	100.7
1	3.0	288	0.600	1.15	800.20	82	234	256	43	1.0	1.0	99.2
2	6.0	294	0.740	1.30	802.06	83	235	256	42	1.0	2.0	99.2
2	9.0	292	0.650	1.25	804.12	83	235	255	42	1.0	2.0	99.0
3	12.0	297	0.750	1.30	806.05	84	234	256	42	1.0	3.0	99.1
3	15.0	304	0.950	2.00	808.12	84	234	255	42	1.0	3.0	98.9
4	18.0	309	0.980	2.05	810.43	85	235	254	43	1.0	4.0	100.1
4	21.0	309	0.950	2.00	812.80	85	235	251	44	1.5	4.0	99.9
5	24.0	311	1.000	2.10	815.13	85	235	257	44	1.5	5.0	100.5
5	27.0	313	1.100	2.10	817.53	85	235	257	45	1.5	5.0	100.3
6	30.0	312	0.750	1.30	820.04	85	235	257	45	1.5	6.0	98.9
6	33.0	311	0.680	1.30	822.09	85	235	259	46	1.5	6.0	99.3
7	36.0	308	0.600	1.15	824.05	85	235	260	46	1.5	7.0	98.4

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.22.95
RUN : T11-MP-B
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	312	0.660	1.25	825.88	85	235	263	46	1.5	7.0	99.8
8	42.0	313	0.650	1.25	827.82	85	234	261	45	1.5	8.0	99.0
8	45.0	312	0.520	1.05	829.73	85	234	260	46	1.5	8.0	99.5
9	48.0	306	0.550	1.05	831.45	85	234	260	45	1.5	9.0	99.2
9	51.0	304	0.620	1.20	833.22	85	234	263	45	1.5	9.0	96.5
10	54.0	303	0.550	1.05	835.05	85	234	263	45	1.5	10.0	99.6
10	57.0	304	0.550	1.05	836.83	85	234	264	45	1.5	10.0	99.6
	60.0				838.61							
		304	0.759	1.52		83	234	257	43	1.2		100.3

ISOKINETIC TEST DATA FORM

Sample Type: MS Reference Method: EPA M29 Page 1 of 5

Client:	Rigo + Rigo	City, Province:	Layton, Utah.
Project Number:	5416265	Test Number:	T11-MP-B
Sample Location:	B Stack	Date:	951122
Start Time:	14:08	Finish Time:	16:39
Barometric Press. (in Hg):	25.5	Stack Press(in H_2O):+ or -:	-.47
Stack Diameter (in.):	53	Length x Width:	____ x ____
Stack Height (ft):	116	Cyclonic Flow:	Yes No ✓

Sample Box Number:	T3	Gas Meter Factor:	1.006	Calibration Date:	Sept/95
Nozzle I.D.:	Q2	Nozzle Diameter (in.):	0.244	Calibration Date:	Nov/95
Probe I.D.:	T1-7'	Pitot Coefficient:	0.789	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): 9.47 0_2 (%): 10.68 CO (ppm): ____ Other: ____

Impinger 1 (g)	202.0	Assumed H_2O (%):	10
Impinger 2 (g)	66.1	Filter I.D. #:	102507 5254
Impinger 3 (g)	12.6	Net Filter Wt. (g):	—
Impinger 4 (g)	1.8	Net Probe Wash Wt. (g):	—
Impinger 5 (g)	0.1	Imp. Residue Wt. (g):	—
Impinger 6 (g)	0.2		
XAD-2 Trap (g)	24.3		
Total H_2O Condensed (g)	309.1		

Sampling Comments: _____

Process Rate: AG Reagent + High AC - min 300F

Control Equipment Operation: ESP

Process Comments: _____

Signature: _____ Date: 951122

MOISTURE ANALYSIS DATA SHEET

Project #:	5911265	Client:	R&R
Date:	95-11-22	Test:	TII-MP-B
Sample Location:	Stack B	Filter I.D.:	5259 2CNRN-10250
Pre Weights by:	JH	Post Weights by:	JH

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	671.0	669.0	202 ✓
2	5% HNO_3 10% H_2O_2	649.5	583.4	66.1 ✓
3	5% HNO_3 10% H_2O_2	621.9	609.3	12.6 ✓
4	Blank	499.7	492.9	1.8 ✓
5	$KMnO_4$	580.9	580.8	0.1 ✓
6	$KMnO_4$	606.5	606.3	0.2 ✓
7	S.O.	820.1	793.8	26.3 ✓
8				
XAD Trap				309.1 ✓
			Total (g)	~~299.1~~

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights	295.0	295.1	✓	JH

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.22

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BOVAR-CONCORD Environmental

DATE: 95/11/22 SAMPLING TRAINS DATA SHEET

Client: RigotRijo Project #: 5411265 Sample Location: B-Stack Operators: JW/JM

Run #: TII-MP-B Traverse #: 1 Traverse Direction: IN Start Time: 14:08 Finish Time: 15:08

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.82	1.80		754.182	303	234	255	44	NA	76	74	1.0
1	3		0.68	1.5	756.355	756.44	302	234	259	39		80	75	1.0
2	6		0.77	1.5	*758.419	758.56	302	234	256	38		81	75	1.0
2	9		0.71	1.4	760.666	760.66	301	234	255	37		83	76	1.0
3	12		0.73	1.4	*762.682	762.67	300	234	254	36		83	76	1.0
3	15		0.64	1.25	764.72	764.66	297	233	254	37		83	77	1.0
4	18		0.87	1.80	*766.580	766.56	299	234	255	39		84	77	1.0
4	21		1.0	2.15	768.798	768.80	304	235	258	40		85	78	1.0
5	24		1.0	2.10	*771.20	771.28	307	235	257	40		85	79	1.0
5	27		1.0	2.1	773.68	773.72	310	236	257	42		86	79	1.0
6	30		0.97	2.0	*776.12	776.14	312	235	258	43		86	79	1.0
6	33		0.76	1.45	778.503	778.59	307	234	258	44		86	80	1.0
7	36		0.72	1.4	*780.682	780.70	304	234	258	45		86	80	1.0

Pre test leak check: Rate (cfm) .006 at 15 inches Hg (Vacuum) Leak Volume Start: ____ Leak Volume End: ____

Post test leak check: Rate (cfm) .009 at 17 inches Hg (Vacuum) Leak Volume Start: ____ Leak Volume End: ____

K value calculated by: ____ Checked by: ____ Operator Signature: JW

DATE: 05/11/22 SAMPLING TRAINS DATA SHEET PAGE 3 OF 5

Client: Rizo+Rizo Project #: 5411626S Sample Location: B Stack Operators: JW/JM

Run #: TII-MP-B Traverse #: 1 Traverse Direction: IN Start Time: 14:08 Finish Time: 15:08

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
											N/A			
7	39		.78	1.45	782.736	782.72	301	234	258	44		86	81	1.0
8	42		0.87	1.80	784.839	784.80	303	233	256	44		86	81	1.0
8	45		0.83	1.7	787.038	787.03	304	233	258	44		87	81	1.0
9	48		0.80	1.6	789.216	789.28	304	233	255	45		87	81	1.0
9	51		0.89	1.7	791.426	791.44	301	234	258	45		87	82	1.0
10	54		0.73	1.35	793.626	793.63	302	235	255	45		87	82	1.0
10	57		0.73	1.35	795.680	795.68	301	234	253	45		87	82	1.0
10	60				797.730	797.731								

Pre test leak check: Rate (cfm) .006 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .009 at 17 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 5/11/22 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: Rio+Rio Project #: 5416265 Sample Location: B Stack Operators: JL/JM

Run #: TH-mP-B Traverse #: 2 Traverse Direction: IN Start Time: 15:39 Finish Time: 16:38

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.55	1.15		798.393	284	234	258	47	NA	81	81	1.0
1	3		0.60	1.15	800.173	800.20	288	234	256	43		83	81	1.0
2	6		0.74	1.3	802.059	802.06	294	235	256	42		85	81	1.0
2	9		0.65	1.25	804.174	804.12	292	235	255	42		85	81	1.0
3	12		0.75	1.3	806.055	806.05	297	234	256	42		86	81	1.0
3	15		0.95	2.0	808.173	808.12	304	234	255	42		86	81	1.0
4	18		0.98	2.05	810.459	810.43	309	235	254	43		87	82	1.0
4	21		0.95	2.0	812.806	812.80	309	235	251	44		87	82	1.5
5	24		1.0	2.1	815.139	815.13	311	235	257	44		87	82	1.5
5	27		1.1	2.10	817.530	817.53	313	235	257	45		87	82	1.5
6	30		0.75	1.3	820.047	820.04	312	235	257	45		87	82	1.5
6	33		0.68	1.3	822.118	822.09	311	235	259	46		87	82	1.5
7	36		0.60	1.15	824.069	824.05	308	235	260	46		87	82	1.5

Pre test leak check: Rate (cfm) .009 at 18 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .006 at 17 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 5/11/22 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rigetti Project #: 5416265 Sample Location: B Stack Operators: JW/JM

Run #: B11-mp-8 Traverse #: 2 Traverse Direction: IN Start Time: 15:39 Finish Time: 16:39

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
											NA			
7	39		0.66	1.25	B25.909	825.88	312	235	263	46		86	83	1.5
8	42		0.65	1.25	*827.879	827.82	313	234	261	45		87	83	1.5
8	45		0.52	1.05	829.755	829.73	312	234	260	46		87	83	1.5
9	48		0.55	1.05	*831.461	831.45	306	234	260	45		87	83	1.5
9	51		0.62	1.2	833.23	833.22	304	234	263	45		87	83	1.5
10	54		0.55	1.05	*835.109	835.05	303	234	263	45		87	83	1.5
10	57		.55	1.05	836.83	836.83	304	234	264	45		87	83	1.5
10	60				838.610	838.610								

Pre test leak check: Rate (cfm) .009 at 18 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .006 at 17 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: 951122 TEST T1/-MP-B

Client: Rizo+Rizo Location: B Stack Operator: JW

Sample Type: MS Reference Method: EPA M29

Modifications: ____

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	---	
Static positive or negative	---	neg.
Average Temperature	---	
Estimate % H_2O	---	16
How estimated?	---	
Estimate Gas Composition	---	O_2% ___ CO_2(%) ___ CO(ppm) ___
How Estimated?	---	
Proper nozzle selected?		
K factor	---	
Number of sampling points per traverse	---	10
Probe markings correct?	✓	
Time per point	---	6
Number of readings per point	---	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other		watch
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or		
Quartz	✓	
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or		
Quartz or	✓	
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5416265 DATE: 05 1122 TEST TII-MP-B

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	---	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor		
Thermocouple		
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre		
Quartz	✓	
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	✓	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol	NA	
Thermocouple attached to trap		
XAD-2 Trap covered with foil at all times		

QA/QC CHECKLIST

PROJECT # 5416265 DATE: 951122 TEST T11-MP-B

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	7	
Contents #1		
#2		
#3		
#4		
#5		
#6		
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly		
Modifications		
Grease used on joints	✓	
Silica gel type		
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate		0.006 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	N/A	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel		
Leak checks at port changes Before		.009 cfm@ 17 "Hg
After		.009 cfm@ 13 "Hg
Final leak race acceptable		.006 cfm@ 17 "Hg
General comments on sampling technique		
Sample recovery performed on-site?		
Sample recovery performed by		
Clean-up area - General Environment		
Brushes: Nylon bristle		
Other	✓	
Wash Bottles: Glass		

PROJECT # 541625 DATE: 971122 TEST TO-MP-B

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	---	teflon
Leak free	✓	
Petri Dishes: borosilicate glass		
plastic	✓	
Balance Type	---	digital toploader
Calibrated or QC checked	---	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		pink/blue.
Weighed	✓	
Filter Handling		
Tweezers used?		
Condition?		
Colour of Filter		
Foil Wrapped?		
Probe Rinses		
Acetone		
Other		
Particulate Recovered from		
probe/nozzle		
probe fitting		
probe liner		
front half filter holder		
Impingers		
Recovered according to protocol		
Weighted		
H_2O/Recovery data sheet completed		
Blanks Collected		
Reagents		
Solvents		
Resin		
Blank Train		
Samples labelled and stored properly		
Liquid levels marked		
Samples delivered to lab		

ISOKINETIC TEST DATA FORM

Sample Type: Organics Blank Reference Method: EPA M23 Page 1 of 2

Client:	Rige + Rige	City, Province:	Layton, UTAH
Project Number:	5416265	Test Number:	B2-OC
Sample Location:	B Stack	Date:	Nov 22/95
Start Time:	17:45	Finish Time:	17:48
Barometric Press. (in Hg):	25.5	Stack Press(in H_2O): + or -:	-0.47 (NA).
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes (No)

Sample Box Number: T1	Gas Meter Factor: .993	Calibration Date: Sept 19/95
Nozzle I.D.: T1-2	Nozzle Diameter (in.): .228	Calibration Date: Nov 16/95
Probe I.D.: T2-7	Pitot Coefficient: .796	Calibration Date: Sept/95

Equipment Comments: —

STACK GAS COMPOSITION

CO_2 (%): — 0_2 (%): — CO (ppm): — Other: —

Impinger 1 (g)	0.0	Assumed H_2O (%):	—
Impinger 2 (g)	0.0	Filter I.D. #:	—
Impinger 3 (g)	0.6	Net Filter Wt. (g):	—
Impinger 4 (g)	0.0	Net Probe Wash Wt. (g):	—
Impinger 5 (g)	2.1	Imp. Residue Wt. (g):	—
Impinger 6 (g)	—		
XAD-2 Trap (g)	0.0		
Total H_2O Condensed (g)	2.1		

Sampling Comments: Train 05 (reused after T10-OCA) Trap 14

Process Rate: —

Control Equipment Operation: —

Process Comments: —

Signature: [signature] Date: Nov. 22/95

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	Rigo & Rigo
Date:	Nov 22/95	Test:	B2 - OC
Sample Location:	B Stack	Filter I.D.:	—
Pre Weights by:	NVB	Post Weights by:	JM.

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Empty	421.6	421.6	0.0
2	ROOI	635.0	635.1	0.0
3	ROOI	596.1	596.4	0.0
4	Empty	493.6	493.6	0.0
5	Silica Gel	780.6	778.5	2.1
6				
7				
~~8~~ Condenser		350.0	350.7	0.0
XAD Trap		334.1*	336.6	0.0
			Total (g)	2.1

* LOST SOME SAND - NO GLASS WOOL PLUG.

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	147.5	147.6	✓	
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: Train 05 (recirc after TIO-OCA)
Trap 14

Signature:

Date: NOV. 22/95

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BOVAR-CONCORD Environmental

DATE: 11/22/95 SAMPLING TRAINS DATA SHEET PAGE 2 OF 2

Client: Rego LRego Project #: 5416265 Sample Location: B Stack Operators: HUB

Run #: B2-OC Traverse #: NA Traverse Direction: NA Start Time: 17:45 Finish Time: 17:48

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
	0			0.6		575.59					53	76	76	
	3				577.01	577.01								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

Z:\FORMS\STDS.FRM NEED TO PULL VOLUME OF 1.42.

BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: Nov 22/95 TEST B2-OC

Client: Rust + Rigo Location: B Stack Operator: [illegible]
Layton, UTAH #2
Sample Type: Organics Blank Reference Method: EPA M23
Modifications: Train recovered following Environment Canada method, train rinse with acetone/DCM followed by train rinsing with toluene.

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?		NA
Avg. ΔP	⟷	"
Static positive or negative	⟷	"
Average Temperature	⟷	"
Estimate % H_2O	⟷	"
How estimated?	⟷	"
Estimate Gas Composition	⟷	O_2% ___ CO_2(%) ___ CO(ppm) ___
How Estimated?	⟷	NA
Proper nozzle selected?		"
K factor	⟷	"
Number of sampling points per traverse	⟷	"
Probe markings correct?		"
Time per point	⟷	"
Number of readings per point	⟷	"
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other		
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	Acetone rinse after T11-OC-B
Round ? Undamaged?		
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	Acetone rinse after T11-OC-B
PROBE HEATING SYSTEM:		
Checked		NA
Temperature 250 ± 25°F		"
Stable		"

PROJECT # 5416265 DATE: Nov 22/95 TEST B2-OC

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	⟷	
Connected to:		NA
inclined manometer		"
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak		NA
Pitot pressure gauge zeroed		"
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor		NA
Thermocouple		"
Type		"
Temp. checked against ambient temp		"
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	Prior to Train 05 after TIO-OCA
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	X	NA
Temperature (250 ± 25°F)		"
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	Prior to Train 05 after TIO-OCA
Thermocouple attached to trap	X	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 5416265 DATE: Nov 22/95 TEST B2-OC

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	Proofed Train OS after T10-OCA
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	MT
#2	⟷	RODI
#3	⟷	RODI
#4	⟷	MT
#5	⟷	S.G.
~~#6~~	⟷	
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly		NA
Modifications	⟷	
Grease used on joints	X	
Silica gel type	⟷	
New?		
Used?	✓	
Pre Test Leak Check		
Performed	X	
Rate	⟷	cfm@ "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off		NA
Is care taken to avoid scraping nipple or stackwall		"
Effective seal around probe when in-stack		"
Probe moved to traverse point at right time		"
Nozzle and pitot tube kept parallel to stack at all times		"
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F		NA
Probe temperature 250 ± 25°F		"
Filter box temperature 250 ± 25°F		"
Data forms completed and data recorded properly	✓	
Ice level checked		NA
Condition of silica gel	⟷	
Leak checks at port changes Before	⟷	NA cfm@ "Hg
After	⟷	" cfm@ "Hg
Final leak race acceptable	⟷	" cfm@ "Hg
General comments on sampling technique	⟷	Ambient air equivalent to average
Sample recovery performed on-site?		leak check volume for the days
Sample recovery performed by RB	⟷	testing
Clean-up area - General Environment	⟷	Clean
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 5416265 DATE: Nov 22/95 TEST B2-OC

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	⟷	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass		filter in cleaned foil and in
plastic		in plastic bag
Balance Type	⟷	Top Loader
Calibrated or QC checked	⟷	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently		NA
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		
Weighed		
Filter Handling		
Tweezers used?	✓	
Condition?		Good
Colour of Filter		White
Foil Wrapped?	✓	
Probe Rinses		
Acetone DCM	✓	
Other Toluene	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

#13

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: B-STACK TEST #: B2-OC DATE: Nov 22/95 PROJECT NO.: 541-6265

Nozzle, Probe Liner Front Half Filter Holder All Equipment	Filter	Back Half Filter Holder and Condenser Coil All Equipment	XAD Resin	Impingers & ~~HPLC~~ Rinse RODI	Back Half Rinse
DCM Wash and brush 3x each with ~~hexane~~ and acetone. Rinse 3x with ~~hexane~~ and and acetone. DCM	Remove and place on pre-cleaned foil fold in half and place in ~~petri dish~~ Zip Loc bag	**Weigh Coil & Record Weight** ~~Soak 5 minutes each with hexane and acetone. Rinse 3x with hexane and acetone.~~ TOLUENE RINSE	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil. TRAP #14	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into container #4. ~~Rinse 3x with HPLC water.~~	Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone.

DCM **Container ~~TS1~~ TS2 Front Half Acetone ~~Hexane~~ Rinse**		**Container ~~TS2~~ TS1 Filter**		**Container TS3 Back Half Filter and Condenser Coil**		**Container TS4 XAD Resin**		**Container TS5 Impinger Contents**		**Container TS6 Back Half Rinse**	
Final Wt:	413.3	Filter ID:	B2-OC	Final Wt:	401.7	**Wrap in Foil**		Final Wt:	552.1	Final Wt:	
Initial Wt:	263.6	Colour:	White	Initial Wt:	264.9	XAD:	046630	Initial Wt:	266.0	Initial Wt:	
Gain:	149.7			Gain:	136.8	Colour:	White	Gain:	286.1	Gain:	
				Colour:	Clear	TRAP #14		Colour:	Clear	Colour:	

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	05
RODI ~~HPLC~~ Batch No.:	ZENON 95/10/26
Acetone Batch No.:	CALEDON 14123
DCM ~~Hexane~~ Batch No.:	CALEDON 16700
Filter Batch No.: ZENON 95/10/26	XAD No.:
Train Assembled By:	HVB
Train Recovered By:	RB

Reagent Blanks Collected?	Yes.
Combined Acetone/~~Hexane~~ DCM	Yes.
~~Combined Glycol~~/Water	Yes.
Blank Train Collected?	Yes.
Comments:	

EPSREC.DRW-May 95

BOVAR-CONCORD Environmental

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: Stack M TEST #: T11-MP-B DATE: 95.11.22 PROJECT NO.: 5416265

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	**Container TS3 Front Half 0.1 N HNO3 Rinse** Final Wt.: 340.8 Initial Wt.: 265.3 Gain: 75.5 Comments:	Brush loose particulate onto filter	**Container TS4-1 Impinger 4 Contents** Final Wt.: 736.7 Initial Wt.: 264.9 Gain: 471.8	**Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse** Final Wt.: 392.8 Initial Wt.: 264.8 Gain: 128.0 Colour: CLEAR	Rinse with 100 mL 0.1 N HNO3	Rinse 3x with 100 mL Acidified KMnO4	Place rinsing in Container 5C which contains 200 mL of water	
Container TS2 Front Half Acetone Rinse Final Wt.: 286.6 Initial Wt.: 188.0 Gain: 98.6 Comments: may contain some of filter		**Filter TS2** Seal petri dish with tape Colour: GREY-GREEN (LIGHT) Filter #: 5259 ZEON 102507			**Container T5A Impinger 4 Contents** Final Wt.: 260 Initial Wt.: 188.0 Gain: 72.0	Rinse with 100 mL water **Container 5B Impinger 5 & 6 KMnO4 Content and Rinses** Final Wt.: 730.7 Initial Wt.: 264.5 Gain: 466.2 Colour: PURPLE	**Container 5C HCL Rinse** Final Wt.: 502.7 Initial Wt.: 269.1 Gain: 238.6 Colour: CLEAR PURPLE	

Train Identification	Blanks
Train No.:	
HNO3 / H2O2 Batch No.:	Container 9 200 mLs
DI Water Batch No.:	Container 8B 100 mLs
Acetone Batch No.:	Container 7 100 mLs
0.1 N HNO3 Batch No.:	Container 8A 300 mLs
Acidified KMnO4 Batch No.:	Container 10 100 mLs
8 N HCl / Batch No.: DI Water	Container 11 25 mL / 200 mL
Filter Number:	Container 12 * _____

Mark Liquid Level on Containers
Seal and Label Containers
Reagent Blanks Submitted? Yes ✓ No ✓
Prepare Fresh Acidified KMnO4 Daily ✓

M29REC.DRW-May 95

BOVAR-CONCORD Environmental

NOVEMBER 23, 1995

METHOD 26
HCl SAMPLING DATA FORM

P_{bar} 25.6 in Hg

Company Name	DAVIS COUNTY	Plant Location	LAYTON UTAH	Source Name	STACK B
Test Date	NOV 23/95	Test Number	T13-HCl-A	Job Number	5416265
Sampling for	HCl	Meter Box	V1 1,001	B.P. mm/inHg	860 Barber

ABSORBING SOL'N	15 ml 0.1 N H_2SO_4	15 ml 0.1 N H_2SO_4	15 ml 0.1 N NaOH	15 ml 0.1 N NaOH	Silica Gel	GAS	1	2	3	4
WEIGHTS	IMP 1	IMP 2	IMP 3	IMP 4	IMP 5	READINGS				
EMPTY						O2				
FILLED FINAL						CO2				
FILLED INITIAL						CO				
DIFFERENCE						TIME				

OPERATOR	JMA	Sample Rate (Lpm)	N 2	H20 Condensed	
Lk.Chk, (Init.)	0 cc/min	Lk. Chk. (Final)	0 cc/min	Probe Purged	(Yes) No)

Sample Time	Clock Time	Volume m³ Desired	Volume m³ Actual	Vacuum in.Hg	Meter Temp. °C (°F)	Probe Temp. °C (°F)	Box Temp. °C (°F)	Impinger Temp. °C (°F)
0	0		1461.8	1	80.5	228	268	
10	5		1471.85	1	84.5	281	274	
20	10		1481.9	1	86	308	279	
30	15		1492.15	1	83.5	295	279	
40	20		1502.3	1	83	236	273	
50	25		1512.3	1	82.5	295	260	
60	30		1522.3	1	82	246	255	
70	35		1532.4	1	81.5	296	248	
80	40		1542.45	1	81.5	254	245	
90	45		1552.45	1	82.5	293	242	
100	50		1562.55	1	82.5	246	242	
110	55		1572.65	1	82	298	242	
120	60		1582.65	1	81	276	242	
		4.46/101	120.85	1	82.5	273	257	

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4.272 ft³

TIME ON 12:50

TIME OFF 13:50

BOVAR CONCORD Environmental

HCl METHOD 26 SAMPLING TRAIN
RECOVERY DATA FORM

PROJECT NO.: 5416267

LOCATION: Stack B TEST #: T13-HCLA DATE: 95.11.23

Impingers 1 and 2	Impingers 3 and 4
Weigh impingers Empty contents into container and rinse with DI water	Weigh impingers Empty contents into container and rinse with DI water

Container TS1 Impingers 1 and 2 0.1 N H2SO4 Contents and DI Water Rinses	
Final Wt.:	128.8
Initial Wt.:	28.8
Gain:	100.0

Container TS2 Impingers 3 and 4 0.1 N NaOH Contents and DI Water Rinses	
Final Wt.:	128.6
Initial Wt.:	28.6
Gain:	1000

Mark Liquid Level ✓	Seal and Label ✓

Train Identification	
Train No.:	
0.1 N H2SO4 Batch No.:	Zenon
DI Water Batch No.:	Zenon
0.1 N NaOH Batch No.:	Zenon
Train Loaded By:	JA
Recovered By:	JA
Reagent Blank Submitted: Yes ✓	No ____

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	R&R
Date:	95-11-23	Test:	9s T-13-HCl A
Sample Location:	Stack B	Filter I.D.:	NA
Pre Weights by:	JH	Post Weights by:	JH

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	104.4	86.6	17.8 ✓
2	0.1N H_2SO_4	104.8	96.1	8.7 ✓
3	0.1N H_2SO_4	93.8	105.7	-11.9 ✓
4	Blank	73.3	71.1	2.2 ✓
5	0.1N NaOH	85.8	98.9	-13.1 ✓
6	0.1N NaOH	106.5	96.8	9.7 ✓
7	SG.	119.2	117.0	2.2 ✓
8				
XAD Trap				
			Total (g)	15.6 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights	295.0	295.7	✓	JH

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95 11 23

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BOVAR-CONCORD Environmental

SYSTEM CALIBRATION AND DRIFT CALCULATIONS

CLIENT	RIGO+RIGO	DATE	NOV23/95
PROJECT NUMBER	5416265	TIME START	09:14
SAMPLE LOCATION	STACK	TIME FINISH	12:26
	TEST NUMBER	T12CEMA	

INSTRUMENT SPAN VALUES

OXYGEN	25	%	CARBON DIOXIDE	20	%
SULPHUR DIOXIDE	1000	PPM	CARBON MONOXIDE	1000	PPM
NITROGEN OXIDES	1000	PPM	TOTAL HYDROCARBONS	100	PPM

ITEM	CAL.GAS VALUE	ANAL. CAL.	INITIAL VALUES SYSTEM CAL.	INITIAL VALUES SYSTEM CAL. BIAS (% SPAN)	FINAL VALUES SYSTEM CAL.	FINAL VALUES SYSTEM CAL. BIAS (% SPAN)	DRIFT (% SPAN)
O2 ZERO	0	0	0.03	0.1	0.1	0.4	0.3
O2 CAL	9.91	9.9	9.83	-0.3	10.16	1.0	1.3
SO2 ZERO	0	1.5	6	0.5	1	-0.1	-0.5
SO2 SPAN	149	149	136	-1.3	143	-0.6	0.7
NOX ZERO	0	1.5	2.6	0.1	2.6	0.1	0.0
NOX SPAN	302	304	301	-0.3	304	0.0	0.3
CO2 ZERO	0	0.03	0.04	0.1	0.06	0.2	0.1
CO2 SPAN	7.01	7.05	7.03	-0.1	7.03	-0.1	0.0
CO ZERO	0	1	0.9	-0.0	1	0.0	0.0
CO SPAN	100	101.6	101.5	-0.0	101	-0.1	-0.1
THC ZERO	0	0.75	0.84	0.1	2.1	1.4	1.3
THC SPAN	20.1	22.2	22	-0.2	23.6	1.4	1.6

DRIFT CRITERIA <5% SPAN
BIAS CRITERIA <5% SPAN

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO	DATE : 11.23.95
JOBSITE : LAYTON UTAH	RUN : T12-OC-A
REF.No. : 5416265	LOC. : STACK B

RUN TIME : 9:39 TO 12:14

ORGANICS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
ORGANICS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	1.7329 DSm3	61.188 DScf
AVERAGE ISOKINETICITY	101.4 %	

FLUE GAS CHARACTERISTICS

MOISTURE		16.89 %	
TEMPERATURE		148.2 deg C	298.8 deg F
FLOW		46148 DSm3/hr	27162 DScfm
		91826 Am3/hr	54047 Acfm
VELOCITY		17.92 m/s	3527.7 fpm
GAS ANALYSIS	O2	10.60 %	
	CO2	9.60 %	
	CO	0.00 %	
	SO2	0.00 %	
	MOL. WT.	30.07 g/gmole D.B.	
	MOL. WT.	28.03 g/gmole W.B.	

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.23.95
RUN : T12-OC-A
LOC. : STACK B

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.7 kPa	25.60 in.Hg
STATIC PRESSURE	-124.5 Pa	-0.50 in.H2O
NOZZLE DIAMETER	5.79 mm	0.2280 in.
PITOT COEFFICIENT	0.796	
METER CORRECTION FACTOR	0.983	

CONDENSATE COLLECTION

RESIN TRAP CONDENSATE	3.0 g
CONDENSATION IN IMPINGER 1	237.6 g
CONDENSATION IN IMPINGER 2	1.6 g
CONDENSATION IN IMPINGER 3	2.1 g
CONDENSATION IN IMPINGER 4	0.2 g
SILICA GEL WEIGHT GAIN	14.5 g
TOTAL MOISTURE GAIN	259.0 g

ORGANICS COLLECTION

FILTER ORGANICS	0.0000 mg
WASHINGS ORGANICS	0.0000 mg
RESIN ORGANICS	0.0000 mg
IMPINGER ORGANICS	0.0000 mg
TOTAL ORGANICS	0.0000 mg

TOTAL SAMPLING TIME	120.0 min.

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.23.95
RUN : T12-OC-A
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1													
1	0.0	293	0.450	0.60	79.66	72	239	245	46	47	3.0	1.0	100.1
1	3.0	292	0.450	0.60	81.08	73	240	244	47	47	3.0	1.0	99.8
2	6.0	296	0.620	0.95	82.50	74	241	245	47	46	6.0	2.0	100.7
2	9.0	298	0.620	0.95	84.18	76	243	247	48	47	6.0	2.0	100.0
3	12.0	297	0.550	0.85	85.85	76	243	247	48	47	6.0	3.0	101.5
3	15.0	296	0.550	0.85	87.45	76	242	246	48	47	6.0	3.0	102.1
4	18.0	299	0.550	0.85	89.06	77	244	247	49	47	5.0	4.0	102.7
4	21.0	299	0.550	0.80	90.68	77	244	247	49	47	5.0	4.0	101.5
5	24.0	300	0.600	0.87	92.28	78	243	249	50	47	6.0	5.0	103.2
5	27.0	303	0.680	0.90	93.98	78	243	247	50	47	7.0	5.0	101.6
6	30.0	302	0.970	1.60	95.76	79	244	249	51	49	8.0	6.0	101.8
6	33.0	306	0.970	1.55	97.89	80	244	248	52	50	8.0	6.0	102.9
7	36.0	305	0.810	1.20	100.04	80	244	249	53	51	7.0	7.0	100.9
7	39.0	304	0.810	1.25	101.97	79	243	250	54	52	7.0	7.0	100.9
8	42.0	298	0.700	1.20	103.90	79	244	248	55	52	7.0	8.0	103.1
8	45.0	295	0.700	1.15	105.74	80	245	249	56	52	7.0	8.0	101.0
9	48.0	285	0.550	0.80	107.55	80	243	248	58	53	6.0	9.0	101.3
9	51.0	286	0.550	0.80	109.17	80	243	251	59	53	6.0	9.0	102.0
10	54.0	280	0.500	0.70	110.80	80	243	248	60	53	5.0	10.0	97.4
10	57.0	280	0.500	0.75	112.29	80	243	248	60	53	6.0	10.0	98.7
	60.0				113.80								
TRAVERSE NO. 2													
1	0.0	285	0.670	1.00	14.19	79	244	249	52	63	6.0	1.0	101.1
1	3.0	285	0.670	1.00	15.97	79	244	250	53	55	7.0	1.0	101.6
2	6.0	280	0.670	1.00	17.76	80	245	251	52	54	7.0	2.0	100.5
2	9.0	290	0.700	1.10	19.54	81	245	249	53	54	7.0	2.0	103.3
3	12.0	290	0.860	1.40	21.40	81	244	250	53	55	8.0	3.0	103.3
3	15.0	292	0.860	1.40	23.46	81	245	250	53	55	8.0	3.0	102.0
4	18.0	300	0.900	1.35	25.49	81	245	250	53	56	7.0	4.0	100.2
4	21.0	307	0.900	1.35	27.52	81	245	250	53	58	7.0	4.0	100.1
5	24.0	308	0.900	1.40	29.54	82	244	250	53	59	8.0	5.0	102.5
5	27.0	310	1.000	1.60	31.61	82	244	249	53	59	8.0	5.0	101.2
6	30.0	311	1.000	1.50	33.76	82	244	252	54	59	8.0	6.0	101.7
6	33.0	312	0.860	1.30	35.92	82	245	249	54	59	8.0	6.0	101.1
7	36.0	310	0.810	1.20	37.91	82	246	249	54	59	7.0	7.0	102.9

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.23.95
RUN : T12-OC-A
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	311	0.880	1.30	39.88	82	246	250	55	57	7.0	7.0	101.4
8	42.0	313	0.800	1.25	41.90	82	249	250	55	56	7.0	8.0	100.6
8	45.0	311	0.800	1.30	43.81	82	244	250	56	56	7.0	8.0	103.1
9	48.0	310	0.720	1.20	45.77	82	244	250	57	56	7.0	9.0	104.2
9	51.0	309	0.720	1.15	47.65	82	246	251	58	56	7.0	9.0	103.0
10	54.0	302	0.620	0.85	49.51	82	244	250	58	56	6.0	10.0	99.1
10	57.0	301	0.620	0.88	51.18	82	244	250	58	56	6.0	10.0	100.2
	60.0				52.87								
		299	0.707	1.09		79	244	249	53	53	6.6		101.4

ISOKINETIC TEST DATA FORM

Sample Type: ORGANICS Reference Method: EPA M23 Page 1 of 5

Client:	RIGGS RIGG	City, Province:	LAYTON, UTAH
Project Number:	5416265	Test Number:	T12-OCA
Sample Location:	B STACK	Date:	Nov 23/95
Start Time:	9:39	Finish Time:	12:14
Barometric Press. (in Hg):	25.6	Stack Press(in H_2O): + or (-)	-0.50
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes (No)

Sample Box Number:	T1	Gas Meter Factor:	0.983	Calibration Date:	SEPT. 19/95
Nozzle I.D.:	T1-2	Nozzle Diameter (in.):	0.228	Calibration Date:	NOV. 16/95
Probe I.D.:	T2-7	Pitot Coefficient:	0.796	Calibration Date:	SEPT. 95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): 9.63 O_2 (%): 10.64 CO (ppm): _____ Other: _____

Impinger 1 (g)	237.6	Assumed H_2O (%):	16
Impinger 2 (g)	1.6	Filter I.D. #:	—
Impinger 3 (g)	2.1	Net Filter Wt. (g):	—
Impinger 4 (g)	0.2	Net Probe Wash Wt. (g):	—
Impinger 5 (g)	14.5	Imp. Residue Wt. (g):	—
~~Impinger 6~~ CONDENSER (g)	0.0		
XAD-2 Trap (g)	3.0		
Total H_2O Condensed (g)	259.0		

Sampling Comments: TRAIN 07 (reused after T11-OCB) Trap 10

Process Rate: _____

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: Nov 23/95

MOISTURE ANALYSIS DATA SHEET

Project #:	5411265	Client:	RIEG & RIEG
Date:	NOV. 22/95	Test:	T12-OC-A
Sample Location:	B STACK	Filter I.D.:	
Pre Weights by:	JMC.	Post Weights by:	HVB

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	EMPTY	713.2	475.6	237.6
2	RODI H_2O	616.4	614.8	1.6
3	RODI H_2O	604.9	602.8	2.1
4	EMPTY	426.6	426.4	0.2
5	SILICA GEL.	795.1	780.6	14.5
6				
7				
~~8~~	CONDENSER	242.8	242.8	0.0
XAD Trap		341.4	338.4	3.0
			Total (g)	259.0

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: TRAIN 07 (reused after T11-OCB)
TRAP 18

Signature:

Date: Nov 23/95

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BOVAR-CONCORD Environmental

DATE: 11/23/95 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: RIGO ; RIGO Project #: 5416265 Sample Location: B STACK Operators: HUB/JM

Run #: T12-OCA Traverse #: 1 Traverse Direction: NORTH Start Time: 9:39 Finish Time: _____

Pt. For wall	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH) 1 min.	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.45	.60	.484	79.66	293	239	245	47	46	72	71	3
	3		0.45	.60	.484	81.08	292	240	244	47	47	74	72	3
2	6		.62	.95	.568	82.50	296	241	245	46	47	75	73	6
	9		.62	.95	.568	84.18	298	243	247	47	48	77	74	6
3	12		0.55	.85	.535	85.85	297	243	247	47	48	78	74	6
	15		0.55	.85	.535	87.45	296	242	246	47	48	78	74	6
4	18		0.55	.85	.535	89.06	299	244	247	47	49	80	74	5
	21		0.55	.80	.535	90.68	299	244	247	47	49	80	74	5
5	24		.60	.87	.559	92.28	300	243	249	47	50	80	75	6
	27		0.68	.90	.595	93.98	303	243	247	47	50	81	75	7
6	30		0.97	1.6	.710	95.76	302	244	249	49	51	82	76	8
	33		0.97	1.65	.710	97.89	306	244	248	50	52	83	76	8

Pre test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 77.50 Leak Volume End: 79.66

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 11/23/15

SAMPLING TRAINS DATA SHEET

Client: Rigo & Rigo | Project #: 5416265 | Sample Location: B Stack | Operators: HUB / JM

Run #: T12-OCA | Traverse #: 1 | Traverse Direction: North | Start Time: _____ | Finish Time: 10:37

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3) 1 min.	Actual (ft^3)								
7	36		0.81	1.2	.649	100.04	305	244	249	51	53	83	76	7
	39		0.81	1.25	.649	101.97	304	243	250	52	54	82	76	7
8	42		0.70	1.2	.603	103.90	298	244	248	52	55	82	76	7
	45		0.70	1.15	.603	105.74	295	245	249	52	56	83	77	7
9	48		0.55	0.8	.535	107.55	285	243	248	53	58	82	77	6
	51		0.55	0.8	.535	109.17	286	243	251	53	59	82	77	6
10	54		0.50	0.70	.510	110.80	280	243	248	53	60	82	77	5
	57		0.50	0.75	.510	112.29	280	243	248	53	60	82	77	6
	60					113.80								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: 113.80 Leak Volume End: _____

Post test leak check: Rate (cfm) 0.007 at 15 inches Hg (Vacuum) Leak Volume Start: 113.80 Leak Volume End: 113.96

K value calculated by: _____ Checked by: _____ Operator Signature: _____

DATE: 11/23/95 SAMPLING TRAINS DATA SHEET

Client: Rigo + Rigo Project #: 5416265 Sample Location: R Stack Operators: HUB/JM

Run #: T12-01A Traverse #: 2 Traverse Direction: East Start Time: 10:14 Finish Time: _____

Pt. For all	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F) 285	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.67	1.0	.600	614.19	285	244	249	63	52	79	78	6
	3		0.67	1.0	.600	615.97	285	244	250	55	53	80	78	7
2	6		0.67	1.0	.600	17.76	280	245	251	54	52	81	79	7
	9		0.70	1.1	.624	19.54	280	245	249	54	53	82	79	7
3	12		0.86	1.4	.692	21.40	280	244	250	55	53	82	79	8
	15		0.86	1.4	.692	23.46	282	245	250	55	53	83	78	8
4	18		0.90	1.35	.684	25.49	300	245	250	56	53	83	78	7
	21		0.90	1.35	.684	27.52	307	245	250	58	53	83	79	7
5	24		0.90	1.4	.684	29.54	308	244	250	59	53	84	79	8
	27		1.0	1.6	.721	31.61	310	244	249	59	53	84	79	8
6	30		1.0	1.5	.721	33.76	311	244	252	59	54	84	79	8
	33		0.86	1.3	.669	35.92	312	245	249	59	54	84	79	8

Pre test leak check: Rate (cfm) 0.009 at 15 inches Hg (Vacuum) Leak Volume Start: 613.96 Leak Volume End: 614.19

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 11/23/15 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rigo+Rigo Project #: 5416265 Sample Location: B Stack Operators: HUB / JM

Run #: T12-αCA Traverse #: 2 Traverse Direction: East Start Time: _____ Finish Time: 12:14

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.81	1.2	.649	37.91	310	246	249	59	54	84	79	7
	39		0.88	1.3	.676	39.88	311	246	250	57	55	84	79	7
8	42		0.80	1.25	.645	41.90	313	249	250	56	55	84	79	7
	45		0.80	1.3	.645	43.81	311	244	250	56	56	84	79	7
9	48		0.72	1.2	.612	45.77	310	244	250	56	57	84	79	7
	51		0.72	1.15	.612	47.65	309	246	251	56	58	84	79	7
10	54		0.62	0.85	.568	49.51	302	244	250	56	58	84	79	6
	57		0.62	0.88	.568	51.18	301	244	250	56	58	84	79	6
	60					52.87								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 52.87 Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

QA/QC CHECKLIST

PROJECT # 5416265 DATE: Nov 23/95 TEST T12-OCA

Client: Rigo + Rigo Location: B Stack Operator: HUB/JM

Sample Type: Organics Reference Method: EPA M23

Modifications: Recovery following Env. Can procedures, train rinse with acetone/DCM with pluving rinse with toluene

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	
Static positive or negative	⟷	-ve
Average Temperature	⟷	300 °F
Estimate % H_2O	⟷	16 %
How estimated?	⟷	Previous tests (T10 & T11)
Estimate Gas Composition	⟷	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	⟷	CEM
Proper nozzle selected?	✓	
K factor	⟷	.721 at 300 °F
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other	✓	watch
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	Pluving rinse after B2-OC
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	Pluving rinse after B2-OC
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5416265 DATE: Nov 23/95 TEST T12-OCA

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	⟷	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	Rinsing of train 07 after T11-OCB
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	Rinsing of train 07 after T11-OCB
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 54/6265 DATE: Nov 23/95 TEST T12-0CA

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	Placing of Train 07 after T11-0CB
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	MT
#2	⟷	RODI
#3	⟷	RODI
#4	⟷	MT
#5	⟷	S-G.
~~#6~~	⟷	
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	⟷	
Grease used on joints	X	
Silica gel type	⟷	
New?		
Used?	✓	
Pre Test Leak Check		
Performed	✓	
Rate	⟷	0.01 cfm@ 15 "Hg
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	
Leak checks at port changes Before	⟷	0.007 cfm@ 15 "Hg
After	⟷	0.009 cfm@ 15 "Hg
Final leak race acceptable	⟷	0-01 cfm@ 15 "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	RB / JA
Clean-up area - General Environment	⟷	Clean
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 5416265 DATE: Nov 23/95 TEST TIZ-OCA

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	✓	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass		filter in cleaned foil in plastic bag
plastic		
Balance Type	✓	top loader
Calibrated or QC checked	✓	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		75% spent
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		good
Colour of Filter		white
Foil Wrapped?	✓	
Probe Rinses		
Acetone / DCM	✓	
Other Teflon	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

1 | 17

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: G- STACK TEST #: T12 - OC - A DATE: NOV 23/95 PROJECT NO.: 541-62-65

Nozzle, Probe Liner Front Half Filter Holder All Equipment	Filter	Back Half Filter Holder and Condenser Coil All Equipment	XAD Resin	Impingers & ~~HPLC~~ Rinse RODS	Back Half Rinse
DCM Wash and brush 3x each with ~~hexane~~ and acetone. DCM Rinse 3x with with ~~hexane~~ and and acetone.	Remove and place on pre-cleaned foil fold in half and place in ~~petri dish~~. Ziploc bag	**Weigh Coil & Record Weight** ~~Soak 5 minutes each with hexane and acetone. Rinse 3x with hexane and acetone.~~ TOLUENE RINSE	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into container. ~~Rinse 3x with HPLC~~ water.	Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone.

DCM **Container ~~TS1~~ TS2 Front Half Acetone ~~Hexane~~ Rinse**		**Container ~~TS2~~ TS1 Filter**		**Container TS3 Back Half Filter and Condenser Coil**		**Container TS4 XAD Resin**		**Container TS5 Impinger Contents**		**Container TS6 Back Half Rinse**	
Final Wt:	453.7	Filter ID:	T12-OC	Final Wt:	415.9	**Wrap in Foil**		Final Wt:	757.6	Final Wt:	
Initial Wt:	262.7	Colour:	~~Clear~~	Initial Wt:	263.0	XAD:	046634	Initial Wt:	262.9	Initial Wt:	
Gain:	191.0			Gain:	152.9	Colour:	White	Gain:	494.7	Gain:	
				Colour:	Clear	Trap 18		Colour:	Clear	Colour:	

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	07
RODS ~~HPLC~~ Batch No.:	ZENON 95/10/26
Acetone Batch No.:	CALEDON 14123
DCM ~~Hexane~~ Batch No.:	CALEDON 16700
Filter Batch No.: ZENON 95/10/26	XAD No.: Trap 18
Train Assembled By:	JD
Train Recovered By:	[illegible]

Reagent Blanks Collected?	Yes
Combined Acetone/Hexane	Yes
Combined Glycol/Water	Yes
Blank Train Collected?	Yes
Comments:	

EPSREC.DRW-May 95

BOVAR-CONCORD Environmental

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.23.95
RUN : T12-MP-A
LOC. : STACK B

RUN TIME : 9:38 TO 12:14

METALS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
METALS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	2.0290 DSm3	71.646 DScf
AVERAGE ISOKINETICITY	100.8 %	

FLUE GAS CHARACTERISTICS

MOISTURE	16.94 %	
TEMPERATURE	149.7 deg C	301.4 deg F
FLOW	47463 DSm3/hr	27936 DScfm
	94838 Am3/hr	55820 Acfm
VELOCITY	18.51 m/s	3643.4 fpm

GAS ANALYSIS	O2	10.60 %
	CO2	9.60 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.07 g/gmole D.B.
	MOL. WT.	28.03 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.23.95
RUN : T12-MP-A
LOC. : STACK B

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.7 kPa	25.60 in.Hg
STATIC PRESSURE	-124.5 Pa	-0.50 in.H2O
NOZZLE DIAMETER	6.20 mm	0.2440 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	214.3 g
CONDENSATION IN IMPINGER 2	64.3 g
CONDENSATION IN IMPINGER 3	9.8 g
CONDENSATION IN IMPINGER 4	0.9 g
CONDENSATION IN IMPINGER 5	1.2 g
CONDENSATION IN IMPINGER 6	0.3 g
SILICA GEL WEIGHT GAIN	13.7 g
TOTAL MOISTURE GAIN	304.5 g

METALS COLLECTION

FILTER METALS	0.0000 mg
WASHINGS METALS	0.0000 mg
IMPINGER METALS	0.0000 mg
TOTAL METALS	0.0000 mg

TOTAL SAMPLING TIME 120.0 min.

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.23.95
RUN : T12-MP-A
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	295	0.790	1.70	39.94	72	232	261	56	1.0	1.0	101.1
1	3.0	296	0.780	1.70	42.06	74	231	258	48	1.5	1.0	101.3
2	6.0	300	0.850	1.85	44.18	76	232	257	43	1.5	2.0	103.9
2	9.0	301	0.800	1.70	46.45	76	233	260	43	1.5	2.0	104.8
3	12.0	298	0.730	1.60	48.67	77	234	261	42	1.5	3.0	104.3
3	15.0	297	0.680	1.40	50.79	77	235	262	43	1.5	3.0	357.2
4	18.0	299	0.780	1.70	57.81	77	235	262	44	1.5	4.0	%-131.9
4	21.0	299	0.850	1.80	55.04	78	236	260	44	1.5	4.0	103.8
5	24.0	300	0.940	1.85	57.32	78	236	261	44	1.5	5.0	100.5
5	27.0	303	1.000	1.90	59.64	79	236	259	44	1.5	5.0	99.2
6	30.0	306	1.100	2.00	62.00	79	235	260	45	1.5	6.0	98.0
6	33.0	306	0.990	1.90	64.44	80	239	259	45	1.5	6.0	97.6
7	36.0	305	0.820	1.75	66.75	80	235	262	46	1.5	7.0	103.9
7	39.0	305	0.820	1.75	68.99	81	236	260	47	1.5	7.0	102.4
8	42.0	304	0.780	1.70	71.20	81	236	260	47	1.5	8.0	103.9
8	45.0	301	0.750	1.65	73.39	81	236	258	47	1.5	8.0	103.3
9	48.0	301	0.740	1.50	75.53	81	236	261	48	1.5	9.0	101.1
9	51.0	302	0.770	1.50	77.61	81	237	260	49	1.5	9.0	100.0
10	54.0	302	0.680	1.40	79.71	82	237	259	49	1.5	10.0	100.2
10	57.0	302	0.750	1.50	81.69	82	237	262	49	1.5	10.0	100.3
	60.0				83.77							
TRAVERSE NO. 2												
1	0.0	279	0.480	0.95	84.84	79	235	262	55	1.0	1.0	99.5
1	3.0	280	0.500	0.95	86.51	80	234	261	43	1.0	1.0	99.0
2	6.0	281	0.550	1.05	88.21	81	235	260	43	1.5	2.0	96.6
2	9.0	285	0.580	1.10	89.95	81	234	260	42	1.5	2.0	96.5
3	12.0	295	0.890	1.90	91.73	84	235	261	42	1.5	3.0	98.8
3	15.0	302	0.900	1.90	93.98	83	235	260	43	1.5	3.0	101.6
4	18.0	303	0.930	1.90	96.29	83	234	261	43	1.5	4.0	101.3
4	21.0	307	0.910	1.90	98.63	83	235	260	44	1.5	4.0	103.5
5	24.0	308	0.960	1.90	100.99	84	235	259	44	1.5	5.0	101.1
5	27.0	311	1.100	2.00	103.36	84	234	259	46	1.5	5.0	97.1
6	30.0	312	0.850	1.80	105.79	84	234	260	47	1.5	6.0	100.0
6	33.0	311	0.780	1.70	107.99	84	234	260	48	1.5	6.0	104.3
7	36.0	310	0.550	1.05	110.19	84	235	258	49	1.5	7.0	100.2

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.23.95
RUN : T12-MP-A
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	310	0.610	1.10	111.97	83	235	260	50	1.5	7.0	96.9
8	42.0	314	0.620	1.15	113.78	83	235	260	50	1.5	8.0	97.4
8	45.0	310	0.590	1.10	115.61	84	235	260	48	1.5	8.0	125.6
9	48.0	307	0.590	1.15	117.92	84	234	261	49	1.5	9.0	71.0
9	51.0	304	0.570	1.15	119.23	84	234	260	50	1.5	9.0	100.2
10	54.0	304	0.450	0.95	121.05	84	233	260	50	1.5	10.0	103.4
10	57.0	302	0.490	1.00	122.72	84	234	260	50	1.5	10.0	101.4
	60.0				124.43							
		301	0.748	1.54		81	235	260	46	1.5		100.8

ISOKINETIC TEST DATA FORM

Sample Type: MS Reference Method: EPA M29 Page 1 of 5

Client:	Rio Tinto	City, Province:	Layton, Utah
Project Number:	5416265	Test Number:	T12-MP-A
Sample Location:	B Stack	Date:	951123
Start Time:	9:38	Finish Time:	12:14
Barometric Press. (in Hg):	25.6	Stack Press(in H_2O):+ or -:	-0.5
Stack Diameter (in.):	53	Length x Width:	____ x ____
Stack Height (ft):	112	Cyclonic Flow:	Yes ____ No ✓

Sample Box Number:	T3	Gas Meter Factor:	1.006	Calibration Date:	Sept/95
Nozzle I.D.:	Q2	Nozzle Diameter (in.):	0.244	Calibration Date:	Nov/95
Probe I.D.:	T1-7'	Pitot Coefficient:	~~.788~~ .799	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%):	9.63	O_2 (%):	10.64
CO (ppm):	____	Other:	____
Impinger 1 (g)	214.3	Assumed H_2O (%):	16
Impinger 2 (g)	64.3	Filter I.D. #:	5261-2 102509
Impinger 3 (g)	9.8	Net Filter Wt. (g):	—
Impinger 4 (g)	0.9	Net Probe Wash Wt. (g):	—
Impinger 5 (g)	1.2	Imp. Residue Wt. (g):	—
Impinger 6 (g)	0.3		
XAD-2 Trap (g)	13.7		
Total H_2O Condensed (g)	~~278.3~~ 304.5		

Sampling Comments: _____

Process Rate: _____

Control Equipment Operation: ESP

Process Comments: _____

Signature: _____ Date: 95.11.23

MOISTURE ANALYSIS DATA SHEET

Project #:	54|6265	Client:	R & R
Date:	95-11-22	Test:	T12-MP-A
Sample Location:	Stack B	Filter I.D.:	BE → 5261 ZENON → 102509
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	713.7	499.4	214.3
2	5% HNO_3 10% H_2O_2	630	565.7	64.3
3	5% HNO_3 10% H_2O_2	627.0	617.2	9.8
4	Blank	490.6	489.7	0.9
5	$KMnO_4$	592.0	590.8	1.2
6	$KMnO_4$	601.9	601.6	0.3
7	S.G.	789.7	776.0	13.7
8				
XAD Trap				304.5
			Total (g)	~~278.3~~

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	295	295.1	✓	JA
Post weights	295	295.1	✓	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95-11-23

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BOVAR-CONCORD Environmental

DATE: 9/11/23 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: R50+R50 Project #: 5416265 Sample Location: BStack Operators: JW/JM

Run #: T12-MP-A Traverse #: 1 Traverse Direction: IN Start Time: 9:38 Finish Time: 10:38

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.79	1.7		839.942	295	232	241	56	NA	72	71	1.0
1	3		0.78	1.7	842.075	842.06	296	231	258	48		77	71	1.5
2	6		0.85	1.85	*844.179	844.18	300	232	257	43		79	72	1.5
2	9		0.80	1.7	846.352	846.45	301	233	260	43		79	72	1.5
3	12		0.73	1.6	*848.596	848.67	298	234	261	42		80	73	1.5
3	15		0.68	1.4	850.72	850.79	297	235	262	43		80	74	1.5
4	18		0.78	1.7	*857.769	857.81	299	235	262	44		80	74	1.5
4	21		0.85	1.80	854.929	855.04	299	235	260	44		81	75	1.5
5	24		0.94	1.85	*857.252	857.32	300	234	241	44		81	75	1.5
5	27		1.0	1.9	859.647	859.64	303	236	259	44		82	76	1.5
6	30		1.1	2.0	*862.04	862.00	306	236	260	45		82	76	1.5
6	33		0.99	1.9	864.517	864.44	306	235	259	45		83	77	1.5
7	30		0.82	1.75	*866.828	866.75	305	234	262	46		83	77	1.5

Pre test leak check: Rate (cfm) .01 at 21 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .011 at 21 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 9/11/23 SAMPLING TRAINS DATA SHEET PAGE 3 OF 5

Client: Rio Tinto Project #: 5416265 Sample Location: B Stack Operators: SW/JM

Run #: T12-MP-A Traverse #: 1 Traverse Direction: IN Start Time: 9:38 Finish Time: 10:38

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
											NA			
7	39		0.82	1.75	868.923	868.99	305	235	260	47		83	78	1.5
8	42		0.78	1.7	871.163	871.20	304	236	260	47		83	78	1.5
8	45		0.75	1.65	873.319	873.39	301	236	258	47		83	78	1.5
9	48		0.74	1.5	875.468	875.53	301	236	261	48		83	78	1.5
9	51		0.77	1.5	877.532	877.61	302	230	260	49		83	79	1.5
10	54		0.68	1.4	879.716	879.71	302	237	259	49		84	79	1.5
10	57		0.75	1.5	881.689	881.69	302	237	262	49		84	79	1.5
10	60				883.765	883.768								

Pre test leak check: Rate (cfm) .010 at 21 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .011 at 21 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 95/11/23 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: Rise Bio Project #: 5416265 Sample Location: B Stack Operators: JW/JM

Run #: T12-MP-A Traverse #: 2 Traverse Direction: IN Start Time: 11:14 Finish Time: 12:14

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		0.48	0.8		884.840	279	235	262	55	NA	79	78	1.0
1	3		0.50	0.95	886.503	886.51	280	234	261	53		82	78	1.0
2	6		0.55	1.05	888.207	888.21	281	235	260	43		83	79	1.0
2	9		0.58	1.1	889.990	889.95	285	234	260	42		83	79	1.5
3	12		0.89	1.9	891.773	891.73	295	235	261	42		84	79	1.5
3	15		0.90	1.9	893.984	893.98	302	235	260	43		85	80	1.5
4	18		0.93	1.9	896.257	896.29	303	234	261	43		85	80	1.5
4	21		0.91	1.9	898.604	898.63	307	235	260	44		86	80	1.5
5	24		0.96	1.9	900.919	900.99	308	235	259	44		86	81	1.5
5	27		1.1	2.0	903.341	903.36	311	234	259	46		86	81	1.5
6	30		0.85	1.8	905.877	905.79	312	234	260	47		86	81	1.5
6	33		0.78	1.7	908.002	907.99	311	234	260	48		86	81	1.5
7	36		0.55	1.05	910.109	910.19	310	235	258	49		86	81	1.5

Pre test leak check: Rate (cfm) .011 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .011 at 16 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

BOVAR-CONCORD Environmental

DATE: 9/11/23 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rio Tinto Project #: 5416265 Sample Location: B Stack Operators: SD/SM

Run #: TT2-MP-A Traverse #: 2 Traverse Direction: W Start Time: 11:14 Finish Time: 12:14

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F) NA	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	39		0.61	1.1	911.970	911.97	310	235	260	50		85	81	1.5
8	42		0.62	1.15	*913.844	913.78	314	235	260	50		85	81	1.5
8	45		0.59	1.1	915.669	915.61	310	235	260	48		86	81	1.5
9	48		0.59	1.15	*917.483	917.42	307	234	261	49		86	82	1.5
9	51		0.57	1.15	919.263	919.23	304	234	260	50		86	82	1.5
10	54		0.45	0.95	*921.075	921.05	304	233	260	50		86	82	1.5
10	57		0.49	1.0	922.666	922.72	302	234	260	50		86	82	1.5
10	60				924.400	924.432								

Pre test leak check: Rate (cfm) .011 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .011 at 16 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 5411265 DATE: 95 11 23 TEST T12-MP-A

Client: R150+R230 Location: B Stack Operator: SW

Sample Type: M5 Reference Method: EPA M29

Modifications:

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	
Static positive or negative	⟷	neg.
Average Temperature	⟷	
Estimate % H_2O	⟷	16
How estimated?	⟷	
Estimate Gas Composition	⟷	O_2% ___ CO_2(%) ___ CO(ppm) ___
How Estimated?	⟷	
Proper nozzle selected?		
K factor	⟷	
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?	✓	
Mercury		
Aneroid		
Other		watch
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or		
Quartz	✓	
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or		
Quartz or	✓	
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5416205 DATE: 981123 TEST 112-MP-A

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications		
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor		
Thermocouple		
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre		
Quartz	✓	
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	✓	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol		
Thermocouple attached to trap		
XAD-2 Trap covered with foil at all times		

PROJECT # 5416265 DATE: 95123 TEST T12-MP-A

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	⟷	7
Contents #1	⟷	
#2	⟷	
#3	⟷	
#4	⟷	
#5	⟷	
#6	⟷	
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly		
Modifications	⟷	
Grease used on joints		
Silica gel type	⟷	
New?	✓	
Used?		
Performed	✓	
Rate	⟷	.101 cfm@ 21 "Hg-
All openings of sampling train sealed	✓	.09
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	NA	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	good
Leak checks at port changes Before	⟷	.011 cfm@ 21 "Hg
After	⟷	.011 cfm@ 15 "Hg
Final leak race acceptable	⟷	.011 cfm@ 16 "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	SA
Clean-up area - General Environment	⟷	
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 5416265 DATE: 95/11/23 TEST TI2-MP-A

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	✓	teflon
Leak free	✓	
Petri Dishes: borosilicate glass		
plastic		
Balance Type	✓	digital toploader.
Calibrated or QC checked	✓	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		blue/pink.
Weighed		
Filter Handling		
Tweezers used?	✓	
Condition?	✓	
Colour of Filter		creamy
Foil Wrapped?		
Probe Rinses		
Acetone	✓	
Other	✓	0.1N HNO3
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected	✓	
Reagents	✓	
Solvents	✓	
Resin	—	
Blank Train	—	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: Stack B TEST #: T-12 MP-A DATE: 95·11·23 PROJECT NO.: 5416265

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	Container TS3 Front Half 0.1 N HNO3 Rinse Final Wt.: 304.2 Initial Wt.: 188.7 Gain: 120.5 Comments:	Brush loose particulate onto filter	Container TS4-1 Impinger 4 Contents Final Wt.: 761.2 Initial Wt.: 263.1 Gain: 498.1	Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse Final Wt.: 475.6 Initial Wt.: 263.4 Gain: 212.2 Colour: 9	Rinse with 100 mL 0.1 N HNO3	Rinse 3x with 100 mL Acidified KMnO4	Place rinsing in Container 5C which contains 200 mL of water	
Container TS2 Front Half Acetone Rinse Final Wt.: 334.8 Initial Wt.: 262.8 Gain: 72.0 Comments:		Filter TS2 Seal petri dish with tape Colour: LIGHT CREAM Filter #: 16 ZENON 102509			Container TSA Impinger 4 Contents Final Wt.: 282.3 Initial Wt.: 188.4 Gain: 93.9	Rinse with 100 mL water Container 5B Impinger 5 & 6 KMnO4 Content and Rinses Final Wt.: 712.3 Initial Wt.: 262.4 Gain: 449.9 Colour:	Container 5C HCL Rinse Final Wt.: 493.1 Initial Wt.: 262.8 Gain: 230.3 Colour:	

Train Identification	Blanks	
Train No.:		
HNO3 / H2O2 Batch No.:	Container 9	200 mLs
DI Water Batch No.:	Container 8B	100 mLs
Acetone Batch No.:	Container 7	100 mLs
0.1 N HNO3 Batch No.:	Container 8A	300 mLs
Acidified KMnO4 Batch No.:	Container 10	100 mLs
8 N HCl / Batch No.: DI Water	Container 11	25 mL / 200 mL
Filter Number:	Container 12	* _____

Mark Liquid Level on Containers
Seal and Label Containers
Reagent Blanks Submitted? Yes ✓ No ___
Prepare Fresh Acidified KMnO4 Daily ✓

M29REC.DRW-May 95

BOVAR-CONCORD Environmental

TIME ON: 17:45

METHOD 26
HCl SAMPLING DATA FORM

P_{bar} 25.5 in Hg

Company Name	DAVIS COUNTY	Plant Location	LAYTON UTAH	Source Name	STACK
Test Date	11/23/05	Test Number	TH-HCl-B	Job Number	5416.26.5
Sampling for	HCl	Meter Box	YI 1.001	B.P. mm/inHg	865 mb

ABSORBING SOL'N	15 ml 0.1 N H_2SO_4	15 ml 0.1 N H_2SO_4	15 ml 0.1 N NaOH	15 ml 0.1 N NaOH	Silica Gel	GAS	1	2	3	4
WEIGHTS	IMP 1	IMP 2	IMP 3	IMP 4	IMP 5	READINGS				
EMPTY						O2				
FILLED FINAL						C02				
FILLED INITIAL						CO				
DIFFERENCE						TIME				

OPERATOR	JM	Sample Rate (Lpm)	N 2	H20 Condensed		
Lk.Chk, (Init.)	0 cc/min	Lk. Chk. (Final)	0 cc/min	Probe Purged	(Yes)	No)

Sample Time	Clock Time	Volume ~~ml~~ L Desired	Actual	Vacuum in.Hg	Meter Temp. °C/(°F)	Probe Temp. °C/(°F)	Box Temp. °C/(°F)	Impinger Temp. °C/°F
0	0		1594.8	1	50.5	292	214	
10	5		1605.65	1	50.5	232	225	
20	10		1616.3	1	51.5	298	248	
30	15		1626.5	1	51.5	327	265	
40	20		1636.7	1	52	299	266	
50	25		1647	1	53	326	269	
60	30		1656.9	1	53	296	273	
70	35		1666.85	1	52.5	234	267	
80	40		1676.95	1	53.5	302	250	
90	45		1686.9	1	53	233	241	
100	50		1697.2	1	54	302	234	
110	55		1707.2	1	54	236	233	
120	60		1717.2	1	55.5	292	239	
		TOT/AVG	122.4	1	56.7	274	248	

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4.327 ft³

BOVAR-CONCORD Environmental

HCl METHOD 26 SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: Stack B TEST #: T14 T-HCl-B PROJECT NO.: 94162GT DATE: 95-11-28

Impingers 1 and 2	Impingers 3 and 4
Weigh impingers Empty contents into container and rinse with DI water	Weigh impingers Empty contents into container and rinse with DI water

Container TS1 Impingers 1 and 2 0.1 N H2SO4 Contents and DI Water Rinses	
Final Wt.:	127.9
Initial Wt.:	23.8
Gain:	104.0

Container TS2 Impingers 3 and 4 0.1 N NaOH Contents and DI Water Rinses	
Final Wt.:	123.3
Initial Wt.:	63.3
Gain:	60.0

545

Mark Liquid Level	Seal and Label

Train Identification	
Train No.:	
0.1 N H2SO4 Batch No.:	Zero
DI Water Batch No.:	Zero
0.1 N NaOH Batch No.:	Zero
Train Loaded By:	JA
Recovered By:	JA
Reagent Blank Submitted: Yes ✓ No ____	

MOISTURE ANALYSIS DATA SHEET

Project #:	5916265	Client:	R & R
Date:	95-11-28	Test:	F14-HCl B
Sample Location:	Stack B	Filter I.D.:	
Pre Weights by:	DA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	86.7	86	9.7 ✓
2	0.1N H_2SO_4	101.4	93.8	7.6 ✓
3	0.1N H_2SO_4	106.1	104.6	1.5 ✓
4	Blank	71.1	71.1	0 ✓
5	0.1N NaOH	99.5	99.5	0 ✓
6	0.1N NaOH	96.8	96.6	0.2 ✓
7	S.G.	124.1	121.0	1.1 ✓
8				
XAD Trap				
			Total (g)	20.1 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95-11-29

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SYSTEM CALIBRATION AND DRIFT CALCULATIONS

CLIENT	RIGO+RIGO	DATE	NOV23/95
PROJECT NUMBER	5416265	TIME START	13:16
SAMPLE LOCATION	STACK	TIME FINISH	17:22
	TEST NUMBER	T13CEMB	

INSTRUMENT SPAN VALUES

OXYGEN	25	%	CARBON DIOXIDE	20	%
SULPHUR DIOXIDE	1000	PPM	CARBON MONOXIDE	1000	PPM
NITROGEN OXIDES	1000	PPM	TOTAL HYDROCARBONS	100	PPM

ITEM	CAL.GAS VALUE	ANAL. CAL.	INITIAL VALUES SYSTEM CAL.	INITIAL VALUES SYSTEM CAL. BIAS (% SPAN)	FINAL VALUES SYSTEM CAL.	FINAL VALUES SYSTEM CAL. BIAS (% SPAN)	DRIFT (% SPAN)
O2 ZERO	0	0.03	0.1	0.3	0.07	0.2	-0.1
O2 CAL	9.91	9.92	9.88	-0.2	9.85	-0.3	-0.1
SO2 ZERO	0	-0.12	1	0.1	0.36	0.0	-0.1
SO2 SPAN	149	149	143	-0.6	142	-0.7	-0.1
NOX ZERO	0	2.7	2.3	-0.0	3.4	0.1	0.1
NOX SPAN	302	304	304	0.0	304	0.0	0.0
CO2 ZERO	0	0.04	0.06	0.1	0.07	0.2	0.1
CO2 SPAN	7.01	7.04	7.05	0.1	7.02	-0.1	-0.2
CO ZERO	0	1	1	0.0	0.9	-0.0	-0.0
CO SPAN	100	101	101	0.0	99	-0.2	-0.2
THC ZERO	0	-0.48	-0.47	0.0	-1.2	-0.7	-0.7
THC SPAN	20.1	21.1	20.9	-0.2	19.4	-1.7	-1.5

DRIFT CRITERIA <5% SPAN
BIAS CRITERIA <5% SPAN

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO	DATE : 11.23.95
JOBSITE : LAYTON UTAH	RUN : T13-OC-B
REF.No. : 5416265	LOC. : STACK B

RUN TIME : 14:54 TO 17:17

ORGANICS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
ORGANICS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	1.7554 DSm3	61.985 DScf
AVERAGE ISOKINETICITY	103.0 %	

FLUE GAS CHARACTERISTICS

MOISTURE	18.23 %	
TEMPERATURE	150.8 deg C	303.5 deg F
FLOW	46048 DSm3/hr	27103 DScfm
	94075 Am3/hr	55371 Acfm
VELOCITY	18.36 m/s	3614.1 fpm

GAS ANALYSIS	O2	9.30 %
	CO2	10.70 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.20 g/gmole D.B.
	MOL. WT.	27.97 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.23.95
RUN : T13-OC-B
LOC. : STACK B

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.4 kPa	25.50 in.Hg
STATIC PRESSURE	-124.5 Pa	-0.50 in.H2O
NOZZLE DIAMETER	5.79 mm	0.2280 in.
PITOT COEFFICIENT	0.796	
METER CORRECTION FACTOR	0.983	

CONDENSATE COLLECTION

RESIN TRAP CONDENSATE	1.5 g
CONDENSATION IN IMPINGER 1	262.2 g
CONDENSATION IN IMPINGER 2	4.7 g
CONDENSATION IN IMPINGER 3	0.6 g
CONDENSATION IN IMPINGER 4	0.9 g
SILICA GEL WEIGHT GAIN	18.0 g
TOTAL MOISTURE GAIN	287.9 g

ORGANICS COLLECTION

FILTER ORGANICS	0.0000 mg
WASHINGS ORGANICS	0.0000 mg
RESIN ORGANICS	0.0000 mg
IMPINGER ORGANICS	0.0000 mg
TOTAL ORGANICS	0.0000 mg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.23.95
RUN : T13-OC-B
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1													
1	0.0	307	0.550	0.80	55.48	76	247	248	70	58	4.0	1.0	104.3
1	3.0	305	0.550	0.80	57.09	76	250	248	46	53	6.0	1.0	105.3
2	6.0	306	0.600	0.85	58.72	78	249	246	46	49	6.0	2.0	103.1
2	9.0	305	0.600	0.85	60.39	78	249	248	47	48	6.0	2.0	101.7
3	12.0	304	0.550	0.82	62.04	79	251	249	46	48	6.0	3.0	102.8
3	15.0	308	0.650	0.95	63.64	80	249	247	47	47	7.0	3.0	103.6
4	18.0	310	0.600	0.85	65.39	80	250	249	45	47	6.0	4.0	101.2
4	21.0	305	0.600	0.85	67.03	80	250	248	46	46	6.0	4.0	102.1
5	24.0	307	0.720	1.20	68.69	80	250	248	47	46	7.0	5.0	105.2
5	27.0	309	0.700	1.00	70.56	80	250	247	46	46	7.0	5.0	103.9
6	30.0	307	0.840	1.25	72.38	80	249	248	46	45	7.0	6.0	101.6
6	33.0	306	0.840	1.30	74.33	80	250	248	46	45	7.0	6.0	102.0
7	36.0	304	0.800	1.20	76.29	80	250	247	45	46	7.0	7.0	104.4
7	39.0	303	0.800	1.20	78.25	79	249	248	45	45	7.0	7.0	104.0
8	42.0	301	0.700	1.00	80.20	79	251	245	48	46	7.0	8.0	102.9
8	45.0	297	0.780	1.10	82.01	79	250	246	48	46	7.0	8.0	101.6
9	48.0	290	0.620	0.90	83.90	79	250	248	51	46	6.0	9.0	101.3
9	51.0	287	0.620	0.90	85.59	79	248	246	52	46	6.0	9.0	102.3
10	54.0	285	0.550	0.80	87.30	79	249	247	53	46	6.0	10.0	101.5
10	57.0	280	0.500	0.75	88.90	79	248	248	55	46	6.0	10.0	102.1
	60.0				90.44								
TRAVERSE NO. 2													
1	0.0	306	0.740	1.10	91.18	79	249	247	60	53	8.0	1.0	104.4
1	3.0	308	0.740	1.10	93.06	80	249	248	62	46	8.0	1.0	103.3
2	6.0	311	0.900	1.40	94.92	80	248	249	60	44	9.0	2.0	104.9
2	9.0	312	0.900	1.40	97.00	80	250	249	60	44	9.0	2.0	104.0
3	12.0	311	0.840	1.30	99.06	81	249	248	52	42	8.0	3.0	103.2
3	15.0	311	0.880	1.35	101.04	81	250	248	46	42	8.0	3.0	102.8
4	18.0	311	0.880	1.35	103.06	82	251	249	45	42	8.0	4.0	102.7
4	21.0	308	0.800	1.20	105.08	82	250	248	45	43	7.0	4.0	102.2
5	24.0	308	0.840	1.30	107.00	82	251	250	44	44	7.0	5.0	101.8
5	27.0	309	0.900	1.40	108.96	82	249	249	44	44	8.0	5.0	102.5
6	30.0	309	0.870	1.35	111.00	81	250	249	44	44	8.0	6.0	103.4
6	33.0	308	0.870	1.35	113.02	81	250	249	44	44	8.0	6.0	102.8
7	36.0	306	0.770	1.20	115.03	81	251	249	44	44	7.0	7.0	102.6

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.23.95
RUN : T13-OC-B
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	307	0.900	1.40	116.92	81	249	248	44	44	8.0	7.0	102.5
8	42.0	307	0.860	1.35	118.96	81	249	248	45	45	8.0	8.0	103.3
8	45.0	308	0.900	1.40	120.97	81	249	248	45	45	8.0	8.0	104.1
9	48.0	308	0.860	1.35	123.04	81	250	247	45	45	8.0	9.0	102.9
9	51.0	309	0.860	1.35	125.04	81	249	247	46	45	8.0	9.0	104.5
10	54.0	280	0.550	0.80	127.07	81	249	248	46	46	6.0	10.0	101.5
10	57.0	275	0.550	0.80	128.68	81	250	248	46	46	6.0	10.0	103.7
	60.0				130.33								
		303	0.733	1.12		80	250	248	49	46	7.1		103.0

ISOKINETIC TEST DATA FORM

Sample Type: Organics Reference Method: EPA M23 Page 1 of 5

Client:	Rigo + Rigo	City, Province:	Layton, UTAH
Project Number:	5416265	Test Number:	TB-OCB
Sample Location:	B Stack	Date:	Nov 23/95
Start Time:	2:54	Finish Time:	5:17
Barometric Press. (in Hg):	28.5	Stack Press(in H_2O): + or -:	-0.5
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes (No)

Sample Box Number:	T1	Gas Meter Factor:	0.983	Calibration Date:	Sept 19/95
Nozzle I.D.:	T1-2	Nozzle Diameter (in.):	0.228	Calibration Date:	Nov 16/95
Probe I.D.:	T2-7	Pitot Coefficient:	0.796	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): 9.3 O_2 (%): 10.7 CO (ppm): _____ Other: _____

Impinger 1 (g)	262.2	Assumed H_2O (%):	16
Impinger 2 (g)	4.7	Filter I.D. #:	—
Impinger 3 (g)	0.6	Net Filter Wt. (g):	—
Impinger 4 (g)	0.9	Net Probe Wash Wt. (g):	—
Impinger 5 (g) 5.6	18.0	Imp. Residue Wt. (g):	—
~~Impinger 6 (g)~~ Condenser	0.0		
XAD-2 Trap (g)	1.5		
Total H_2O Condensed (g)	287.9		

Sampling Comments: Train 05 (reused after B2-OCB) ~~Blank~~ Trap #4

Process Rate: _____

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: Nov 23/95

MOISTURE ANALYSIS DATA SHEET

Project #:	541626J	Client:	Rigo + Rigo
Date:	Nov 23/95	Test:	T13-OC B
Sample Location:	B Stack	Filter I.D.:	
Pre Weights by:	HVB/NL	Post Weights by:	HVB/RB

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	MT	683.6	421.4	262.2
2	RoDI	595.2	593.5	4.7
3	RoDI	636.3	637.7	0.6
4	MT	474.7	~~480.8~~ 473.8	0.9 ~~0.9~~
5	S.G.	750.4	732.4	18.0
6				
7				
~~8~~ Condenser		250.6	250.6	0.0
XAD Trap		317.2	315.7	1.5
			Total (g)	287.9

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: Train 05 (reused after B2-OC)

~~Train~~ Trap #4

Signature:

Date: Nov 23/95

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BOVAR-CONCORD Environmental

DATE: 11 / 23 / 95 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Rigo & Rigo Project #: 5416265 Sample Location: B Stack Operators: HUB / JM

Run #: T13-OCB Traverse #: 1 Traverse Direction: North Start Time: 2:54 Finish Time: _____

Pt. For w-11	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.55	0.8	.535	55.48	307	247	248	50	70	76	75	4
	3		0.55	0.8	.535	57.09	305	250	248	53	46	77	75	6
2	6		0.60	0.85	.559	58.72	306	249	246	49	46	79	76	6
	9		0.60	0.85	.559	60.39	305	249	248	48	47	80	76	6
3	12		0.55	0.8	.535	62.04	304	251	249	48	46	81	77	6
	15		0.65	0.95	.581	63.64	308	249	247	47	47	82	77	7
4	18		0.60	0.85	.559	65.39	310	250	249	47	45	82	77	6
	21		0.60	0.85	.559	67.03	305	250	248	46	46	82	77	6
5	24		0.72	1.2	.612	68.69	307	250	248	46	47	82	77	7
	27		0.70	1.0	.603	70.56	309	250	247	46	47	82	77	7
6	30		0.84	1.25	.661	72.38	307	249	248	45	47	82	77	7
	33		0.84	1.3	.661	74.33	306	250	248	45	47	82	77	7

Pre test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 52.87 Leak Volume End: 55.48

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 12/23/95

SAMPLING TRAINS DATA SHEET

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: HUB / JM

Run #: T13-06B Traverse #: 1 Traverse Direction: North Start Time: _____ Finish Time: 3:54

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	36		0.80	1.2	.645	76.29	304	250	247	46	48	82	77	7
	39		0.80	1.2	.645	78.25	303	249	248	45	48	81	76	7
8	42		0.70	1.0	.603	80.20	301	251	245	46	51	81	77	7
	45		0.78	1.1	.637	82.01	297	250	246	46	52	81	77	7
9	48		0.62	0.9	.560	83.90	290	250	248	46	53	81	77	6
	51		0.62	0.9	.568	85.59	287	246	246	46	55	81	77	6
10	54		0.55	0.8	.535	87.30	285	249	247	46	56	81	77	6
	57		0.50	0.75	.518	88.90	280	240	248	46	58	81	77	6
	60					90.44								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 90.44 Leak Volume End: 90.86

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 11/23/95 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: Rigo + Riga Project #: 5416265 Sample Location: B Stack Operators: HVB/SM

Run #: T13-0CB Traverse #: 2 Traverse Direction: East Start Time: 9:17 Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		0.74	1.1	.620	91.18	306	249	247	53	60	79	78	8
	3		0.74	1.1	.620	93.06	308	249	248	46	62	81	78	8
2	6		0.90	1.4	.684	94.92	311	248	249	44	60	82	78	9
	9		0.90	1.4	.684	98.00	312	250	249	44	60	82	78	9
3	12		0.84	1.3	.661	99.06	311	249	248	42	52	83	78	8
	15		0.88	1.35	.676	101.04	311	250	248	42	46	84	78	8
4	18		0.88	1.35	.676	103.06	311	251	249	42	45	84	79	8
	21		0.80	1.2	.645	105.08	308	250	248	43	45	84	79	7
5	24		0.84	1.3	.661	107.00	308	251	250	44	44	84	79	7
	27		0.90	1.4	.684	108.96	309	249	249	44	44	84	79	8
6	30		0.87	1.35	.673	111.00	309	250	249	44	44	83	78	8
	33		0.87	1.35	.673	113.02	308	250	249	44	44	83	78	8

Pre test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 90.86 Leak Volume End: 91.18

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

DATE: 11/23/95 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: HUB/SM

Run #: T13-OCB Traverse #: 2 Traverse Direction: East Start Time: _____ Finish Time: 5217

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.77	1.2	.633	115.03	306	251	249	44	44	83	78	7
	39		0.90	1.4	.684	116.92	307	249	248	44	44	83	78	8
8	42		0.86	1.35	.669	118.96	307	249	248	45	45	83	78	8
	45		0.90	1.4	.684	120.97	308	249	248	45	45	83	78	8
9	48		0.86	1.35	.669	123.04	308	250	247	45	45	83	78	8
	51		0.86	1.35	.669	125.04	309	249	247	45	46	83	78	8
10	54		0.55	0.80	.544	127.07	280	249	248	46	46	83	78	6
	57		0.55	0.80	.544	128.68	275	250	248	46	46	83	78	6
	60					130.33								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.015 at 15 inches Hg (Vacuum) Leak Volume Start: 130.33 Leak Volume End: 130.55

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: Nov 27/95 TEST T13-OCB

Client: Rigo + Rigo Location: B Stack Operator: NVB/JM
Layton, UTAH
Sample Type: Organics Reference Method: EPA M23
Modifications: Recovery following Env. Can., train rinse w/ acetone/DCM + train proving w/ toluene

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	
Static positive or negative	⟷	-ve
Average Temperature	⟷	300°F
Estimate % H_2O	⟷	16
How estimated?	⟷	previous tests
Estimate Gas Composition	⟷	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	⟷	
Proper nozzle selected?	✓	
K factor	⟷	.1721 at 300°F
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other	✓	watch
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	Proving rinse after T12-OCA
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	Proving rinse after T12-OCA
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 541625 DATE: Nov 23/95 TEST T13-CCB

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	⟷	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	Rinsing rinse of Train 05 after B2-CC
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	Rinsing rinse of Train 05 after B2-CC
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 541265 DATE: Nov 27/95 TEST T13-OCB

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	Proving rinse of Train 05 after BZ-cc
IMPINGERS		
No. of Impingers		5
Contents #1		MT
#2		RODI
#3		RODI
#4		MT
#5		S.G.
~~#6~~		
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications		
Grease used on joints	X	
Silica gel type		
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate		0.01 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel		
Leak checks at port changes Before		0.01 cfm@ 15 "Hg
After		0.01 cfm@ 15 "Hg
Final leak race acceptable		0.015 cfm@ 15 "Hg
General comments on sampling technique		
Sample recovery performed on-site?	✓	
Sample recovery performed by		RB/JA
Clean-up area - General Environment		
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

QA/QC CHECKLIST

PROJECT # 5416265 DATE: Nov 23/95 TEST T13-OCDD

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	↔	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass		filter in cleaned foil + plastic bag
plastic		
Balance Type	↔	top loader
Calibrated or QC checked	↔	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour	✓	25% Spent
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		Good
Colour of Filter		White
Foil Wrapped?		yes
Probe Rinses		
Acetone / DCM	✓	
Other Toluene	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

#15

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: B - Stack TEST #: T13 - 0C - B DATE: Nov 23/95 PROJECT NO.: 541-6265

Nozzle, Probe Liner Front Half Filter Holder All Equipment	Filter	Back Half Filter Holder and Condenser Coil	XAD Resin	Impingers & ~~HPLC~~ Rinse RBJ	Back Half Rinse
DCM Wash and brush 3x each with ~~hexane~~ and acetone. Rinse 3x with DCM with ~~hexane~~ and and acetone.	Remove and place on pre-cleaned foil fold in half and place in ~~petri dish~~. Zip Loc bag	**Weigh Coil & Record Weight** Soak 5 minutes each with hexane and acetone. Rinse 3x with ~~hexane~~ DCM and acetone.	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into container #4. ~~Rinse 3x with HPLC water~~.	Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone.

DCM **Container ~~TS1~~ TS2 Front Half Acetone ~~Hexane~~ Rinse**		**Container ~~TS1~~ TS1 Filter**		**Container TS3 Back Half Filter and Condenser Coil**		**Container TS4 XAD Resin**		**Container TS5 Impinger Contents**		**Container TS6 Back Half Rinse**	
Final Wt:	532.5	Filter ID:	T13 - 0C	Final Wt:	456.7	**Wrap in Foil**		Final Wt:	775.4	Final Wt:	
Initial Wt:	265.9	Colour:	white	Initial Wt:	265.9	XAD:	04543	Initial Wt:	264.3	Initial Wt:	
Gain:	266.6			Gain:	190.8	Colour:	white From #4 Train	Gain:	511.1	Gain:	
				Colour:	Clear Train			Colour:	Clear	Colour:	

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	05
RBJ ~~HPLC~~ Batch No.:	ZENON 95/10/26
Acetone Batch No.:	CARLSON 14123
DCM ~~Hexane~~ Batch No.:	CARLSON 16700
Filter Batch No.:	ZENON 95/10/26 XAD No.: Train #4
Train Assembled By:	HVB
Train Recovered By:	RB

Reagent Blanks Collected?	Yes
Combined Acetone/~~Hexane~~ DCM	Yes
~~Combined Glycol~~/Water	Yes
Blank Train Collected?	Yes
Comments:	

BOVAR-CONCORD Environmental

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.23.95
RUN : T13-MP-B
LOC. : STACK B

RUN TIME : 14:54 TO 17:17

METALS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
METALS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	2.0449 DSm3	72.207 DScf
AVERAGE ISOKINETICITY	100.1 %	

FLUE GAS CHARACTERISTICS

MOISTURE	17.83 %	
TEMPERATURE	151.4 deg C	304.6 deg F
FLOW	48191 DSm3/hr	28364 DScfm
	97729 Am3/hr	57521 Acfm
VELOCITY	19.07 m/s	3754.5 fpm

GAS ANALYSIS	O2	10.70 %
	CO2	9.30 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.03 g/gmole D.B.
	MOL. WT.	27.88 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.23.95
RUN : T13-MP-B
LOC. : STACK B

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.7 kPa	25.60 in.Hg
STATIC PRESSURE	-124.5 Pa	-0.50 in.H2O
NOZZLE DIAMETER	6.20 mm	0.2440 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	182.5 g
CONDENSATION IN IMPINGER 2	94.7 g
CONDENSATION IN IMPINGER 3	27.1 g
CONDENSATION IN IMPINGER 4	6.3 g
CONDENSATION IN IMPINGER 5	2.7 g
CONDENSATION IN IMPINGER 6	-1.7 g
SILICA GEL WEIGHT GAIN	14.8 g
TOTAL MOISTURE GAIN	326.4 g

METALS COLLECTION

FILTER METALS	0.0000 mg
WASHINGS METALS	0.0000 mg
IMPINGER METALS	0.0000 mg
TOTAL METALS	0.0000 mg

TOTAL SAMPLING TIME 120.0 min.

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.23.95
RUN : T13-MP-B
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	307	0.780	1.70	26.55	77	233	261	50	1.0	1.0	100.8
1	3.0	306	0.780	1.70	28.64	79	233	259	49	1.0	1.0	103.4
2	6.0	306	0.870	1.85	30.79	80	233	261	48	1.0	2.0	105.8
2	9.0	306	0.850	1.70	33.12	81	233	256	48	1.0	2.0	102.8
3	12.0	303	0.810	1.60	35.36	81	233	258	49	1.0	3.0	101.7
3	15.0	306	1.000	2.10	37.53	81	233	258	51	1.5	3.0	102.8
4	18.0	308	0.950	1.95	39.96	82	234	259	53	1.5	4.0	102.4
4	21.0	304	0.850	1.65	42.32	83	234	259	55	1.5	4.0	100.9
5	24.0	306	1.100	2.10	44.53	83	235	257	54	1.5	5.0	98.1
5	27.0	308	0.950	1.95	46.97	83	234	259	52	1.5	5.0	101.3
6	30.0	307	0.890	1.70	49.31	84	234	261	51	1.5	6.0	99.1
6	33.0	305	0.950	1.95	51.53	84	233	256	51	2.0	6.0	101.0
7	36.0	304	0.830	1.60	53.87	84	233	262	51	2.0	7.0	98.2
7	39.0	303	0.780	1.55	56.00	84	233	260	50	2.0	7.0	100.3
8	42.0	301	0.750	1.50	58.11	84	234	257	50	2.0	8.0	100.2
8	45.0	302	0.850	1.60	60.18	84	234	257	50	2.0	8.0	97.4
9	48.0	303	0.850	1.65	62.32	84	234	259	48	2.0	9.0	100.6
9	51.0	303	0.850	1.65	64.53	84	234	258	49	2.0	9.0	97.9
10	54.0	304	0.820	1.60	66.68	84	234	260	49	2.0	10.0	97.4
10	57.0	303	0.810	1.60	68.78	84	235	259	49	2.0	10.0	100.8
	60.0				70.94							
TRAVERSE NO. 2												
1	0.0	301	0.550	1.05	71.73	81	239	261	52	2.0	1.0	100.5
1	3.0	300	0.600	1.10	73.50	82	234	261	45	2.0	1.0	98.0
2	6.0	299	0.690	1.25	75.31	83	235	262	45	2.0	2.0	96.4
2	9.0	293	0.650	1.25	77.22	83	236	260	45	2.0	2.0	97.9
3	12.0	292	0.850	1.65	79.11	84	236	261	45	2.0	3.0	97.7
3	15.0	307	0.900	1.70	81.27	84	236	260	46	2.0	3.0	97.6
4	18.0	309	0.900	1.80	83.47	84	236	261	47	2.0	4.0	100.8
4	21.0	307	0.880	1.80	85.74	85	237	265	48	2.0	4.0	100.8
5	24.0	307	0.900	1.80	87.99	85	236	263	49	2.0	5.0	103.2
5	27.0	308	1.000	2.10	90.32	85	237	262	49	2.0	5.0	101.9
6	30.0	307	0.690	1.30	92.74	85	237	260	49	2.0	6.0	99.1
6	33.0	307	0.670	1.30	94.70	85	236	260	49	2.0	6.0	97.4
7	36.0	306	0.610	1.25	96.60	85	236	259	48	2.0	7.0	100.9

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.23.95
RUN : T13-MP-B
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	307	0.670	1.30	98.48	85	235	262	48	2.0	7.0	100.0
8	42.0	305	0.650	1.30	100.43	85	235	260	48	2.0	8.0	100.8
8	45.0	306	0.680	1.30	102.37	85	236	263	47	2.0	8.0	98.6
9	48.0	307	0.690	1.35	104.31	85	236	262	48	2.0	9.0	99.0
9	51.0	308	0.730	1.40	106.27	85	234	260	48	2.0	9.0	99.2
10	54.0	305	0.530	1.05	108.29	85	235	259	48	2.0	10.0	99.5
10	57.0	306	0.550	1.10	110.02	85	234	260	48	2.0	10.0	100.6
	60.0				111.80							
		305	0.787	1.57		83	235	260	49	1.8		100.1

ISOKINETIC TEST DATA FORM

Sample Type: M5 Reference Method: EPA M29 Page 1 of 5

Client:	Rigo & Rigo	City, Province:	Layton, Utah
Project Number:	5416265	Test Number:	T13-MP-B
Sample Location:	B Stack	Date:	95 11 23
Start Time:	14:54	Finish Time:	17:17
Barometric Press. (in Hg):	25.6	Stack Press(in H_2O): + or -:	-.5
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes No ✓

Sample Box Number:	T3	Gas Meter Factor:	1.006	Calibration Date:	Sept 98'
Nozzle I.D.:	Q2	Nozzle Diameter (in.):	0.244	Calibration Date:	Nov 95'
Probe I.D.:	T1-7'	Pitot Coefficient:	~~0.784~~ 0.798	Calibration Date:	Sept 95'

Equipment Comments:

STACK GAS COMPOSITION

CO_2 (%):	9.5	O_2 (%):	10.7
CO (ppm):		Other:	
Impinger 1 (g)	152.5	Assumed H_2O (%):	16
Impinger 2 (g)	94.7	Filter I.D. #:	102509Zenco
Impinger 3 (g)	27.1	Net Filter Wt. (g):	—
Impinger 4 (g)	6.3	Net Probe Wash Wt. (g):	—
Impinger 5 (g)	2.7	Imp. Residue Wt. (g):	—
Impinger 6 (g)	-1.7		
XAD-2 Trap (g)	14.8		
Total H_2O Condensed (g)	326.4		

Process Rate:

Control Equipment Operation: ESP.

Process Comments:

Signature: Date: 95 11 23

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	R&R
Date:	95.11.23	Test:	T13 - MP - B
Sample Location:	Stack B	Filter I.D.:	102509 zeroed 102509
Pre Weights by:	VA	Post Weights by:	VA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	651.6	469.1	182.5 ✓
2	5% HNO_3 10% H_2O_2	684.1	589.4	94.7 ✓
3	5% HNO_3 10% H_2O_2	634.1	607.0	27.1 ✓
4	Blank	499.4	493.1	6.3 ✓
5	$KMnO_4$	583.2	580.5	2.7 ✓
6	$KMnO_4$	601.3	603.0	-1.7 ✓
7	S.G.	822.0	807.2	14.8 ✓
8				
XAD Trap				
			Total (g)	326.9 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	295.6	295.4	✓	VA
Post weights	295.0	295.3	✓	VA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.24

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BOVAR-CONCORD Environmental

DATE: 5/11/23 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Rizo Rizo Project #: 5711265 Sample Location: B Stack Operators: SW/JM

Run #: TB-MP-B Traverse #: 1 Traverse Direction: IN Start Time: 14:54 Finish Time: 15:54

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		.78	1.7		926.557	307	233	261	50	NA	78	76	1.0
1	3		0.79	1.7	928.670	928.64	306	233	259	49		81	76	1.0
2	6		0.87	1.85	*930.759	930.79	306	233	261	48		83	77	1.0
2	9		0.85	1.70	933.028	933.12	306	233	256	48		84	77	1.0
3	12		0.81	1.60	*935.332	935.36	303	233	258	49		84	78	1.0
3	15		1.0	2.1	937.520	937.53	306	233	258	57		84	78	1.5
4	18		0.95	1.95	*939.930	939.96	308	234	259	53		85	79	1.5
4	21		0.85	1.65	942.299	942.32	304	234	259	55		86	79	1.5
5	24		1.1	2.1	*944.532	944.53	306	235	257	54		86	80	1.5
5	27		0.95	1.95	947.047	946.97	308	234	259	52		86	80	1.5
6	30		0.89	1.7	*949.309	949.31	307	234	261	57		86	81	1.5
6	33		0.95	1.95	951.579	951.53	305	233	256	57		86	81	20
7	36		0.83	1.60	*953.869	953.87	304	233	262	51		86	81	

Pre test leak check: Rate (cfm) .008 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .009 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 9/11/23 SAMPLING TRAINS DATA SHEET PAGE 3 OF 5

Client: Rio+Rio Project #: 5416265 Sample Location: BStack Operators: JW/Jm

Run #: T13-WP-B Traverse #: 1 Traverse Direction: ⊘N Start Time: 14:59 Finish Time: 15:57

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	39		0.78	1.55	956.056	956.00	303	233	260	50		86	81	2.0
8	42		0.75	1.5	958.119	958.11	301	234	257	50		86	81	2.0
8	45		0.85	1.6	960.188	960.18	302	234	257	50		86	81	2.0
9	48		0.85	1.65	962.382	962.32	303	234	259	48		86	81	2.0
9	51		0.85	1.45	964.557	964.53	303	234	258	49		86	81	2.0
10	54		0.82	1.6	966.742	966.68	304	234	260	49		86	81	2.0
10	57		0.81	1.6	968.853	968.78	303	235	259	49		86	81	2.0
10	60				970.94	970.942								

NA

Pre test leak check: Rate (cfm) .008 at 5 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .009 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 5/11/23 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: R30+R30 Project #: 5416245 Sample Location: B.Stack Operators: JW/JM

Run #: T13-MP-B Traverse #: 2 Traverse Direction: IN Start Time: 16:17 Finish Time: 17:17

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.55	1.05		971.726	301	234	261	52	NA	81	80	2.0
1	3		0.60	1.1	973.506	973.50	300	284	261	45		84	80	2.0
2	6		0.69	1.25	*975.359	975.31	299	235	262	45		85	80	2.0
2	9		0.65	1.25	977.303	977.22	293	236	260	45		85	80	2.0
3	12		0.85	1.65	*979.155	979.11	292	236	261	45		86	81	2.0
3	15		0.90	1.70	981.322	981.27	307	236	260	46		86	81	2.0
4	18		0.90	1.8	*983.547	983.47	309	236	261	47		87	81	2.0
4	21		0.88	1.8	985.747	985.74	307	237	265	48		87	82	2.0
5	24		0.90	1.8	*987.941	987.99	307	236	263	45		87	82	2.0
5	27		1.0	2.1	990.267	990.32	308	237	262	49		87	82	2.0
6	30		0.69	1.3	*992.720	992.74	307	237	260	49		87	82	2.0
6	33		0.67	1.3	994.733	994.70	307	236	260	49		87	83	2.0
7	36		0.61	1.25	*996.664	996.60	306	236	259	48		87	83	2.0

Pre test leak check: Rate (cfm) 0.005 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .005 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 8/11/23 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: H2O Hero Project #: 541626 Sample Location: B Stack Operators: JW/JM

Run #: TB-MP-B Traverse #: 2 Traverse Direction: IN Start Time: 16:17 Finish Time: 17:17

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
											NA			
7	39		0.67	1.3	998.474	998.48	307	235	262	48		87	82	2.0
8	42		0.65	1.3	*1000.444	1000.43	305	235	260	48		87	83	2.0
8	45		0.68	1.3	1002.365	1002.37	306	236	263	47		87	83	2.0
9	48		0.69	1.35	*1004.349	1004.31	307	236	262	48		87	83	2.0
9	51		0.73	1.4	1006.303	1006.27	308	234	260	48		87	83	2.0
10	54		0.53	1.05	*1008.32	1008.29	305	235	259	48		87	83	2.0
10	57		0.55	1.1	1010.037	1010.02	306	234	260	48		86	83	2.0
10	60				1011.800	1011.801								

Pre test leak check: Rate (cfm) .005 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .005 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: 951123 TEST T13-MP-B

Client: Rigo+Rigo Location: B Stack Operator: SW

Sample Type: MS Reference Method: EPA M29

Modifications:

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	
Static positive or negative	⟷	Neg.
Average Temperature	⟷	
Estimate % H_2O	⟷	16
How estimated?	⟷	
Estimate Gas Composition	⟷	O_2% ___ CO_2(%) ___ CO(ppm) ___
How Estimated?	⟷	
Proper nozzle selected?	✓	
K factor	⟷	
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other		watch
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or		
Quartz	✓	
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or		
Quartz or	✓	
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5911/0265 DATE: 95/1/23 TEST T13-MP-B

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)		
Modifications	---	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor		
Thermocouple		
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre		
Quartz	✓	
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	✓	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol	N/A	
Thermocouple attached to trap		
XAD-2 Trap covered with foil at all times		

PROJECT # 5911626 DATE: 951123 TEST T13-MP-8

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	7	
Contents #1		
#2		
#3		
#4		
#5		
#6		
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly		
Modifications		
Grease used on joints	✓	
Silica gel type		
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate		.008 cfm@ 15 "Hg.
All openings of sampling train sealed		
Is nozzle sealed when probe is in stack with pump off		
Is care taken to avoid scraping nipple or stackwall		
Effective seal around probe when in-stack		
Probe moved to traverse point at right time		
Nozzle and pitot tube kept parallel to stack at all times		
Filters changed during run		
Any particulate lost during filter change		
Sorbent trap kept at ≤68°F		
Probe temperature 250 ± 25°F		
Filter box temperature 250 ± 25°F		
Data forms completed and data recorded properly		
Ice level checked		
Condition of silica gel		
Leak checks at port changes Before		.009 cfm@ 5 "Hg
After		.005 cfm@ 15 "Hg
Final leak race acceptable		.005 cfm@ 15 "Hg
General comments on sampling technique		
Sample recovery performed on-site?	✓	
Sample recovery performed by		Jeff D. Adams
Clean-up area - General Environment		
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 5416265 DATE: 9/7/23 TEST T13-MP-B

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	✓	teflon
Leak free	✓	
Petri Dishes: borosilicate glass		
plastic	✓	
Balance Type		digital top loader
Calibrated or QC checked		Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently		
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		pink blue.
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		
Colour of Filter		
Foil Wrapped?		
Probe Rinses		
Acetone		
Other		
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents		
Solvents		
Resin		
Blank Train		
Samples labelled and stored properly		
Liquid levels marked		
Samples delivered to lab		

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: Stack D TEST #: ~~13~~-MP-B DATE: 95.11.23 PROJECT NO.: 5416265

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	Container TS3 Front Half 0.1 N HNO3 Rinse Final Wt.: 284.7 Initial Wt.: 187.7 Gain: Comments:	Brush loose particulate onto filter	Container TS4-1 Impinger 4 Contents Final Wt.: 778.9 Initial Wt.: 262.9 Gain:	Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse Final Wt.: 363.8 Initial Wt.: 262.8 Gain: Colour:	Rinse with 100 mL 0.1 N HNO3	Rinse 3x with 100 mL Acidified KMnO4	Place rinsing in Container 5C which contains 200 mL of water	
Container TS2 Front Half Acetone Rinse Final Wt.: 348.5 Initial Wt.: 262.9 Gain: Comments:		Filter TS2 Seal petri dish with tape Colour: Filter #: 5262 ZENON 102510			Container TSA Impinger 4 Contents Final Wt.: 304.5 Initial Wt.: 262.1 Gain:	Rinse with 100 mL water	Container 5C HCL Rinse Final Wt.: 490.0 Initial Wt.: 261.8 Gain: Colour:	
		PORTION OF FILTER IN PROBE WASH				Container 5B Impinger 5 & 6 KMnO4 Content and Rinses Final Wt.: 708.5 Initial Wt.: 261.6 Gain: Colour:		

Train Identification	Blanks	
Train No.:		
HNO3 / H2O2 Batch No.:	Container 9	200 mLs
DI Water Batch No.:	Container 8B	100 mLs
Acetone Batch No.:	Container 7	100 mLs
0.1 N HNO3 Batch No.:	Container 8A	300 mLs
Acidified KMnO4 Batch No.:	Container 10	100 mLs
8 N HCl / Batch No.: DI Water	Container 11	25 mL / 200 mL
Filter Number:	Container 12	* _____

Mark Liquid Level on Containers
Seal and Label Containers
Reagent Blanks Submitted? Yes ____ No ____
Prepare Fresh Acidified KMnO4 Daily _____

BOVAR-CONCORD Environmental

NOVEMBER 24, 1995

METHOD 26
HCl SAMPLING DATA FORM

Company Name	DAVIS COUNTY	Plant Location	CENTRAL UTAH	Source Name	STACK 5
Test Date	NOV 24 '95	Test Number	T-15-HCl-A	Job Number	5416265
Sampling for	HCl	Meter Box	V1/1.001	B.P. mm/inHg	85.5 adj.

ABSORBING SOL'N	15 ml 0.1 N H_2SO_4	15 ml 0.1 N H_2SO_4	15 ml 0.1 N NaOH	15 ml 0.1 N NaOH	Silica Gel	GAS	1	2	3	4
WEIGHTS	IMP 1	IMP 2	IMP 3	IMP 4	IMP 5	READINGS				
EMPTY						O2				
FILLED FINAL						CO2				
FILLED INITIAL						CO				
DIFFERENCE						TIME				

OPERATOR	JM	Sample Rate (Lpm)	~2	H20 Condensed		
Lk.Chk, (Init.)	0 cc/min	Lk. Chk. (Final)	cc/min	Probe Purged	(Yes)	No)

Sample Time	Clock Time	Volume m^3/L Desired	Actual	Vacuum in.Hg	Meter Temp. °C/°F	Probe Temp. °C/°F	Box Temp. °C/°F	Impinger Temp. °C/°F
0	0		1754.3	1	68	245	225	
10	5		1764.4	1	68	240	247	
20	10		1774.4	1	68.5	309	235	
30	15		1784.35	1	66.5	246	230	
40	20		1794.5	1	65	320	227	
50	25		1804.7	1	66	248	237	
60	30		1814.3	1	67	317	247	
70	35		1824.3	1	68.5	247	255	
80	40		1834.2	1	69.5	308	261	
90	45		1844.35	1	67	245	261	
100	50		1854.5	1	66	321	256	
110	55		1864.35	1	67.5	255	255	
120	60		1874.5	1	68	254	256	
		AVG/TOT	120.2	1	67	273	245	

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4.249 ft^3

TIME ON 11:55

TIME OFF 12:55

BOVAR CONCORD Environmental

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	R & R
Date:	95.11.29	Test:	T15 HCl A
Sample Location:	Stack B	Filter I.D.:	—
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	96.6	86.0	10.6 ~~80.6~~ ✓
2	0.1N H_2SO_4	99.5	96.4	3.1 ~~-0.9~~ ✓
3	0.1N H_2SO_4	105.5	105.5	0 ✓
4	Blank	71	71.0	0 ✓
5	0.1N NaOH	98.9	99	-0.1 ✓
6	0.1N NaOH	97.4	97.3	0.1 ✓
7	SG	121.1	119.4	1.7 ✓
8				
XAD Trap				
			Total (g)	15.4 ✓

Seems low

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights	258.0	255.2	—	JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments:

Signature:

Date: 95.11.29

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BOVAR-CONCORD Environmental

HCl METHOD 26 SAMPLING TRAIN
RECOVERY DATA FORM

PROJECT NO.: 5416265

LOCATION: Stack B TEST #: T 15-40-A DATE: 95.11.24

Impingers 1 and 2	Impingers 3 and 4
Weigh impingers Empty contents into container and rinse with DI water	Weigh impingers Empty contents into container and rinse with DI water

Container TS1 Impingers 1 and 2 0.1 N H2SO4 Contents and DI Water Rinses	Container TS2 Impingers 3 and 4 0.1 N NaOH Contents and DI Water Rinses
Final Wt.: 132.9	Final Wt.: 133.0
76.7 Initial Wt.: 32.9	Initial Wt.: 33.8
Gain: 100.0	Gain: 100.0
Mark Liquid Level ✓	Seal and Label ✓

Train Identification
Train No.:
0.1 N H2SO4 Batch No.: Zenon
DI Water Batch No.: Zenon
0.1 N NaOH Batch No.: Zenon
Train Loaded By: JH
Recovered By: JH
Reagent Blank Submitted: Yes ✓ No _____

M26RBC.DRW-May 95

BOVAR-CONCORD Environmental

SYSTEM CALIBRATION AND DRIFT CALCULATIONS

CLIENT	RIGO+RIGO	DATE	NOV24/95
PROJECT NUMBER	5416265	TIME START	08:16
SAMPLE LOCATION	STACK	TIME FINISH	10:44
	TEST NUMBER	T14CEMA	

INSTRUMENT SPAN VALUES

OXYGEN	25	%	CARBON DIOXIDE	20	%
SULPHUR DIOXIDE	1000	PPM	CARBON MONOXIDE	1000	PPM
NITROGEN OXIDES	1000	PPM	TOTAL HYDROCARBONS	100	PPM

ITEM	CAL.GAS VALUE	ANAL. CAL.	INITIAL VALUES SYSTEM CAL.	INITIAL VALUES SYSTEM CAL. BIAS (% SPAN)	FINAL VALUES SYSTEM CAL.	FINAL VALUES SYSTEM CAL. BIAS (% SPAN)	DRIFT (% SPAN)
O2 ZERO	0	0.07	0.07	0.0	0.17	0.4	0.4
O2 CAL	9.91	9.95	9.85	-0.4	10.31	1.4	1.8
SO2 ZERO	0	0.36	1.6	0.1	1.2	0.1	-0.0
SO2 SPAN	149	150	143	-0.7	143	-0.7	0.0
NOX ZERO	0	1.64	2.4	0.1	2.9	0.1	0.1
NOX SPAN	302	302	302	0.0	305	0.3	0.3
CO2 ZERO	0	0.04	0.05	0.1	0.11	0.4	0.3
CO2 SPAN	7.01	7.07	7.05	-0.1	7.08	0.0	0.1
CO ZERO	0	0.9	1	0.0	0.9	0.0	-0.0
CO SPAN	100	103	102	-0.1	99.5	-0.4	-0.3
THC ZERO	0	-0.4	-0.2	0.2	2.5	2.9	2.7
THC SPAN	20.1	22.8	22.7	-0.1	23.6	0.8	0.9

DRIFT CRITERIA <5% SPAN
BIAS CRITERIA <5% SPAN

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO	DATE : 11-24-95
JOBSITE : LAYTON UTAH	RUN : T14-OC-A
REF.No. : 5416265	LOC. : B STACK

RUN TIME : 8:47 TO 11:17

ORGANICS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
ORGANICS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	1.7304 DSm3	61.100 DScf
AVERAGE ISOKINETICITY	100.6 %	

FLUE GAS CHARACTERISTICS

MOISTURE	15.71 %	
TEMPERATURE	174.0 deg C	345.2 deg F
FLOW	46481 DSm3/hr	27358 DScfm
	97169 Am3/hr	57192 Acfm
VELOCITY	18.96 m/s	3733.0 fpm

GAS ANALYSIS	O2	10.60 %
	CO2	9.40 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.04 g/gmole D.B.
	MOL. WT.	28.15 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-24-95
RUN : T14-OC-A
LOC. : B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.4 kPa	25.50 in.Hg
STATIC PRESSURE	-129.5 Pa	-0.52 in.H2O
NOZZLE DIAMETER	5.79 mm	0.2280 in.
PITOT COEFFICIENT	0.796	
METER CORRECTION FACTOR	0.983	

CONDENSATE COLLECTION

RESIN TRAP CONDENSATE	0.8 g
CONDENSATION IN IMPINGER 1	212.8 g
CONDENSATION IN IMPINGER 2	4.3 g
CONDENSATION IN IMPINGER 3	1.6 g
CONDENSATION IN IMPINGER 4	1.0 g
SILICA GEL WEIGHT GAIN	16.8 g
TOTAL MOISTURE GAIN	237.3 g

ORGANICS COLLECTION

FILTER ORGANICS	0.0000 mg
WASHINGS ORGANICS	0.0000 mg
RESIN ORGANICS	0.0000 mg
IMPINGER ORGANICS	0.0000 mg
TOTAL ORGANICS	0.0000 mg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-24-95
RUN : T14-OC-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1													
1	0.0	343	0.500	0.65	42.54	68	246	243	45	48	6.0	1.0	100.2
1	3.0	340	0.500	0.65	44.00	69	246	243	44	45	7.0	1.0	99.1
2	6.0	344	0.680	0.90	45.45	70	248	244	45	45	8.0	2.0	99.2
2	9.0	345	0.680	0.92	47.14	70	248	245	45	45	8.0	2.0	100.4
3	12.0	345	0.600	0.75	48.85	71	248	243	48	47	7.0	3.0	98.5
3	15.0	347	0.600	0.85	50.43	71	248	246	49	48	8.0	3.0	98.7
4	18.0	347	0.600	0.82	52.01	72	248	241	49	49	8.0	4.0	101.7
4	21.0	345	0.500	0.70	53.64	72	250	241	49	50	7.0	4.0	99.6
5	24.0	346	0.600	0.82	55.10	73	249	240	50	50	8.0	5.0	102.7
5	27.0	347	0.630	0.83	56.75	73	248	241	50	50	8.0	5.0	101.5
6	30.0	347	0.880	1.30	58.42	73	250	243	50	51	10.0	6.0	101.8
6	33.0	343	0.730	1.00	60.40	73	250	245	48	52	9.0	6.0	99.6
7	36.0	344	0.840	1.20	62.17	74	249	242	45	51	9.0	7.0	99.2
7	39.0	344	0.800	1.20	64.06	74	250	244	45	51	9.0	7.0	100.5
8	42.0	332	0.700	0.95	65.93	74	250	244	45	52	9.0	8.0	99.1
8	45.0	332	0.780	1.10	67.67	75	250	245	45	52	8.0	8.0	98.7
9	48.0	325	0.600	0.83	69.50	75	248	245	45	52	8.0	9.0	101.6
9	51.0	320	0.600	0.83	71.16	75	251	246	46	54	7.0	9.0	100.0
10	54.0	320	0.450	0.75	72.80	41	251	246	47	55	7.0	10.0	108.3
10	57.0	320	0.500	0.70	74.24	75	251	246	47	55	7.0	10.0	101.4
	60.0				75.76								
TRAVERSE NO. 2													
1	0.0	348	0.770	1.00	76.16	76	248	253	57	63	9.0	1.0	99.6
1	3.0	350	0.770	1.05	77.98	77	249	250	60	59	10.0	1.0	100.0
2	6.0	350	0.900	1.40	79.81	78	250	248	61	58	11.0	2.0	102.0
2	9.0	351	0.850	1.20	81.83	79	251	250	59	59	10.0	2.0	101.2
3	12.0	351	0.920	1.30	83.78	79	251	250	54	59	10.0	3.0	99.8
3	15.0	352	0.900	1.35	85.78	80	251	248	54	60	11.0	3.0	100.8
4	18.0	355	1.000	1.50	87.78	80	252	249	52	60	11.0	4.0	101.6
4	21.0	355	1.000	1.45	89.90	80	252	249	54	60	1.0	4.0	100.6
5	24.0	356	1.100	1.55	92.00	79	251	249	52	60	12.0	5.0	100.2
5	27.0	358	1.100	1.60	94.19	79	251	249	52	60	12.0	5.0	100.8
6	30.0	356	0.850	1.20	96.39	79	252	250	54	60	10.0	6.0	100.4
6	33.0	358	1.000	1.45	98.32	79	251	247	53	60	11.0	6.0	100.0
7	36.0	359	0.980	1.45	100.40	79	250	247	51	60	11.0	7.0	101.5

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-24-95
RUN : T14-OC-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	358	0.980	1.40	102.49	79	250	245	53	60	11.0	7.0	101.0
8	42.0	357	0.850	1.20	104.57	79	251	248	52	60	10.0	8.0	99.9
8	45.0	359	0.850	1.25	106.49	79	250	249	53	60	10.0	8.0	100.6
9	48.0	360	0.770	1.00	108.42	79	249	244	53	60	9.0	9.0	99.7
9	51.0	355	0.710	0.98	110.24	79	251	247	53	60	9.0	9.0	101.2
10	54.0	325	0.600	0.80	112.02	79	251	247	53	60	8.0	10.0	98.9
10	57.0	320	0.600	0.85	113.65	79	251	248	55	60	8.0	10.0	101.6
	60.0				115.33								
		345	0.746	1.07		75	250	246	51	55	8.8		100.6

ISOKINETIC TEST DATA FORM

Sample Type: Organics Reference Method: EPA M23 Page 1 of 5

Client:	Rigo & Rigo	City, Province:	Layton, UTAH
Project Number:	5416265	Test Number:	T14-OCA
Sample Location:	B Stack	Date:	Nov 24/95
Start Time:	8:47	Finish Time:	11:17
Barometric Press. (in Hg):	25.57	Stack Press(in H_2O):+ or -:	-0.52
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes (No)

Sample Box Number:	T1	Gas Meter Factor:	0.983	Calibration Date:	Sept 19/95
Nozzle I.D.:	T1-2	Nozzle Diameter (in.):	0.228	Calibration Date:	Nov 16/95
Probe I.D.:	T2-7	Pitot Coefficient:	0.796	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): 9.4 O_2 (%): 10.6 CO (ppm): _____ Other: _____

Impinger 1 (g)	212.8	Assumed H_2O (%):	14
Impinger 2 (g)	4.3	Filter I.D. #:	—
Impinger 3 (g)	1.6	Net Filter Wt. (g):	—
Impinger 4 (g)	1.0	Net Probe Wash Wt. (g):	—
Impinger 5 (g) S.G.	16.4	Imp. Residue Wt. (g):	—
~~Impinger 6 (g)~~ Condenser	0.0		
XAD-2 Trap (g)	0.2		
Total H_2O Condensed (g)	237.3		

Sampling Comments: Train 03 (reused after T8-OCA) Trap 23

Process Rate: _____

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: Nov 24/95

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	Riso & Riso
Date:	Nov 24/95	Test:	T14-0CA
Sample Location:	M Stack	Filter I.D.:	
Pre Weights by:	HWB / AVL	Post Weights by:	HWB

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	MT	667.6	454.8	212.8 ✓
2	RODI	658.4	654.1	4.3 ✓
3	RODI	587.4	585.8	1.6 ✓
4	MT	474.7	473.7	1.0 ✓
5	S.G.	767.2	750.4	16.8 ✓
6				
7				
~~8~~ Condenser		231.3	231.3	0.0 ✓
XAD Trap		336.0	335.2	0.8 ✓
			Total (g)	237.3 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: Train 03 (reused after T4-0CA)
Trap 23

HWB

Signature:

Nov 24/95

Date:

DATE: 11/24/95

SAMPLING TRAINS DATA SHEET

Client: Nuga & Nuga | Project #: 5416265 | Sample Location: R Stack | Operators: HUB/JM

Run #: T14-0CA | Traverse #: 1 | Traverse Direction: North | Start Time: 8:47 | Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		0.50	0.65	.494	42.54	343	246	243	48	45	68	67	6
	3		0.50	0.65	.494	44.00	340	246	243	45	44	70	68	7
2	6		0.66	0.90	.576	45.45	344	248	244	45	45	71	68	8
	9		0.66	0.92	.576	47.14	345	248	245	45	45	72	68	8
3	12		0.60	0.75	.541	48.85	345	248	243	47	48	73	69	7
	15		0.60	0.65	.541	50.43	347	248	246	48	49	73	69	8
4	18		0.60	0.82	.541	52.01	347	249	241	49	49	74	69	8
	21		0.50	0.70	.494	53.64	345	250	241	50	49	74	69	7
5	24		0.60	0.82	.541	55.10	346	249	240	50	50	75	70	8
	27		0.63	0.83	.554	56.75	347	249	241	50	50	75	70	8
6	30		0.88	1.3	.655	58.42	347	250	243	51	50	76	70	10
	33		0.73	1.0	.597	60.40	343	250	245	52	48	76	70	9

Pre test leak check: Rate (cfm) .012 at 15 inches Hg (Vacuum) Leak Volume Start: 42.06 Leak Volume End: 42.54

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

DATE: 11/24/95 SAMPLING TRAINS DATA SHEET

Client: Rego & Rego Project #: 5416265 Sample Location: B Stack Operators: HWB/JM

Run #: T14-OCA Traverse #: 1 Traverse Direction: North Start Time: _____ Finish Time: 9:47

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.84	1.2	.640	62.17	344	249	242	51	45	76	21	9
	39		0.80	1.2	.625	64.06	344	250	244	51	45	77	21	9
8	42		0.70	0.95	.584	65.93	332	250	244	52	45	77	21	9
	45		0.78	1.1	.617	67.67	332	250	245	52	45	77	72	9
9	48		0.60	0.83	.550	69.50	325	248	245	52	45	77	72	8
	51		0.60	0.83	.550	71.16	320	251	246	54	46	77	72	8
10	54		0.45	0.75	.476	72.80	320	251	246	55	47	78	73	7
	57		0.50	0.7	.502	74.24	320	251	246	55	47	79	72	7
	60					75.76								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 75.76 Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

DATE: 11/24/95 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: Rigo & Rigo Project #: 5416265 Sample Location: B Stack Operators: HWB/SM

Run #: T14-OCA Traverse #: 2 Traverse Direction: East Start Time: 10:17 Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		0.77	1.0	.613	76.16	348	248	253	63	57	76	75	9
	3		0.77	1.05	.613	77.98	350	249	250	59	60	78	76	10
2	6		0.90	1.4	.663	79.81	350	250	248	58	61	80	76	12
	9		0.85	1.2	.644	81.83	351	251	250	59	59	81	76	10
3	12		0.82	1.3	.670	83.78	351	251	250	59	59	81	76	10
	15		0.90	1.35	.663	85.78	352	251	248	60	54	82	77	11
4	18		1.00	1.5	.698	87.78	355	252	249	60	52	82	77	11
	21		1.00	1.45	.698	89.90	355	252	249	60	54	82	77	11
5	24		1.10	1.55	.732	92.00	356	251	249	60	52	81	77	12
	27		1.10	1.6	.732	94.19	358	251	249	60	52	81	77	12
6	30		0.85	1.2	.644	96.39	356	252	250	60	54	81	77	10
	33		1.0	1.45	.698	98.32	358	251	247	60	53	81	77	11

Pre test leak check: Rate (cfm) .01 at 15 inches Hg (Vacuum) Leak Volume Start: 75.945 Leak Volume End: 76.165

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

E:\FORMS\STDS.FRM

BOVAR-CONCORD Environmental

DATE: 11/24/95

SAMPLING TRAINS DATA SHEET

Client: Rust Riga Project #: 5416265 Sample Location: B Stack Operators: HUB/JM

Run #: T14-OCA Traverse #: 2 Traverse Direction: East Start Time: ______ Finish Time: 1117

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	36		0.98	1.45	.691	100.40	359	250	247	60	51	81	77	11
	39		0.98	1.4	.691	102.49	358	250	245	60	53	81	72	11
8	42		0.85	1.2	.644	104.57	357	251	248	60	52	81	77	10
	45		0.85	1.25	.644	106.49	359	250	249	60	53	81	77	10
9	48		0.77	1.0	.613	108.42	360	249	244	60	53	81	77	9
	51		0.71	0.98	.589	110.24	355	251	247	60	53	81	77	9
10	54		0.60	0.8	.550	112.02	325	251	247	60	53	81	72	8
	57		0.60	0.85	.550	113.65	320	251	248	60	55	81	77	8
	60					115.33								

Pre test leak check: Rate (cfm) ______ at ______ inches Hg (Vacuum) Leak Volume Start: ____________ Leak Volume End: ____________

Post test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 115.33 Leak Volume End: 115.55

K value calculated by: ____________ Checked by: ____________

Operator Signature: [signature]

BOVAR-CONCORD Environmental

QA/QC CHECKLIST

PROJECT # 5416265 DATE: Nov 24/95 TEST T14-OCA

Client: Rigo & Rigo Location: B Stack Operator: HUB
Layton, UTAH
Sample Type: Organics Reference Method: EPA M23
Modifications: Recovery following Env. Canada procedure, train recovery with acetone/DCM + train proving with toluene

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	
Static positive or negative	⟷	-ve
Average Temperature	⟷	350 °F
Estimate % H_2O	⟷	14%
How estimated?	⟷	previous test)
Estimate Gas Composition	⟷	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	⟷	CEMs
Proper nozzle selected?	✓	
K factor	⟷	
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other	✓	watch
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	Proving rinse after T13-OCB
Round ? Undamaged?		
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	Proving rinse after T13-OCB
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5416265 DATE: Nov 24/95 TEST T14-0CA

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	---	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type		K
Temp. checked against ambient temp	✓	
Borosilicate glass	✓	
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	Proving of Train 03 after T4-0CA
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	Proving of Train 03 after T4-0CA
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 5416205 DATE: Nov 24/95 TEST T14-0CA

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	Proving A Train 3 after T6-0CA
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	MT
#2	⟷	RODI
#3	⟷	RODI
#4	⟷	MT
#5	⟷	S.G.
~~#6~~	⟷	
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	⟷	
Grease used on joints	X	
Silica gel type	⟷	
New?	✓	
Used?	✓	
Pre Test Leak Check		
Performed	✓	
Rate	⟷	0.012 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	25% spent
Leak checks at port changes Before	⟷	0.01 cfm@ 15 "Hg
After	⟷	0.01 cfm@ 15 "Hg
Final leak race acceptable	⟷	0.01 cfm@ 15 "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	RB/JA
Clean-up area - General Environment	⟷	
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 5416265 DATE: Nov 24/95 TEST TI4-0CA

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	—	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass		filters in cleaned foil in
plastic		plastic bag
Balance Type	—	Top loader
Calibrated or QC checked	—	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		70 % spent
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		Good
Colour of Filter		White
Foil Wrapped?		Yes
Probe Rinses		
Acetone / DCM	✓	
Other rinse	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

#16

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: B - STAGE TEST #: TS4 - OC - A DATE: NOV 24/95 PROJECT NO.: 541 - 6265

Nozzle, Probe Liner Front Half Filter Holder All Equipment	Filter	Back Half Filter Holder and Condenser Coil	XAD Resin	Impingers & ~~HPLC~~ Rinse RODJ	Back Half Rinse
DCM Wash and brush 3x each with ~~hexane~~ and acetone. Rinse 3x with DCM with ~~hexane~~ and and acetone.	Remove and place on pre-cleaned foil fold in half and place in ~~petri dish~~. Ziploc bag	**Weigh Coil & Record Weight** Soak 5 minutes each with hexane and acetone. Rinse 3x with ~~hexane~~ DCM and acetone.	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into container #4. ~~Rinse 3x with HPLC water~~.	Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone.

DCM **Container ~~TS1~~ TS2 Front Half Acetone ~~Hexane~~ Rinse**		**Container ~~TS2~~ TS1 Filter**		**Container TS3 Back Half Filter and Condenser Coil**		**Container TS4 XAD Resin**		**Container TS5 Impinger Contents**		**Container TS6 Back Half Rinse**	
Final Wt:	482.5	Filter ID:	TS4 - OC	Final Wt:	427.3	**Wrap in Foil**		Final Wt:	751.9	Final Wt:	
Initial Wt:	266.4	Colour:	White	Initial Wt:	263.1	XAD:	D46639	Initial Wt:	264.3	Initial Wt:	
Gain:	216.4			Gain:	164.2	Colour:	White	Gain:	487.6	Gain:	
				Colour:	Clear	Trap 23		Colour:	Clear	Colour:	

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	03
RODJ ~~HPLC~~ Batch No.:	Zenow 95/10/26
Acetone Batch No.:	Caledon 14123
DCM ~~Hexane~~ Batch No.:	Caledon 16700
Filter Batch No.:	Zenow 95/10/26 XAD No.: Trap 23
Train Assembled By:	HVB / NL
Train Recovered By:	AB

Reagent Blanks Collected?	Yes
Combined Acetone/~~Hexane~~ DCM	Yes
~~Combined Glycol~~/Water	Yes
Blank Train Collected?	Yes
Comments:	

EPSREC.DRW-May 95

BOVAR-CONCORD Environmental

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 24
RUN : T14-MP-A
LOC. : B STACK

RUN TIME : 8:47 TO 11:17

METALS CONCENTRATION	483.5 ug/DSm3	0.2113 gr/1000 DScf
	231.0 ug/Am3	0.1010 gr/1000 Acf
@ 12% CO2	617.2 ug/DSm3	0.2697 gr/1000 DScf
METALS EMISSION RATE	6.607 mg/s	367.07 gr/hr
SAMPLE GAS VOLUME	2.0687 DSm3	73.048 DScf
AVERAGE ISOKINETICITY	99.2 %	

FLUE GAS CHARACTERISTICS

MOISTURE	15.52 %	
TEMPERATURE	175.5 deg C	348.0 deg F
FLOW	49192 DSm3/hr	28953 DScfm
	102944 Am3/hr	60591 Acfm
VELOCITY	20.09 m/s	3954.8 fpm

GAS ANALYSIS	O2	10.60 %
	CO2	9.40 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.04 g/gmole D.B.
	MOL. WT.	28.17 g/gmole W.B.

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 24
RUN : T14-MP-A
LOC. : B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.4 kPa	25.50 in.Hg
STATIC PRESSURE	-124.5 Pa	-0.50 in.H2O
NOZZLE DIAMETER	6.20 mm	0.2440 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	202.9 g
CONDENSATION IN IMPINGER 2	51.7 g
CONDENSATION IN IMPINGER 3	9.4 g
CONDENSATION IN IMPINGER 4	1.9 g
CONDENSATION IN IMPINGER 5	0.5 g
CONDENSATION IN IMPINGER 6	0.0 g
SILICA GEL WEIGHT GAIN	13.2 g
TOTAL MOISTURE GAIN	279.6 g

METALS COLLECTION

FILTER METALS	1.0000 mg
WASHINGS METALS	0.0000 mg
IMPINGER METALS	0.0000 mg
TOTAL METALS	1.0000 mg

TOTAL SAMPLING TIME 120.0 min.

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 24
RUN : T14-MP-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	345	0.880	1.75	14.09	68	236	255	45	1.0	1.0	102.1
1	3.0	344	0.800	1.50	16.30	70	236	249	41	1.0	1.0	101.7
2	6.0	346	0.910	1.75	18.41	71	237	254	40	1.0	2.0	100.8
2	9.0	346	0.860	1.65	20.64	73	238	252	39	1.0	2.0	100.1
3	12.0	345	0.900	1.70	22.80	73	237	253	39	1.0	3.0	99.6
3	15.0	347	0.950	1.75	25.00	74	237	253	40	1.5	3.0	98.7
4	18.0	348	0.920	1.70	27.24	74	237	253	40	1.5	4.0	98.4
4	21.0	345	0.820	1.50	29.44	75	237	255	41	1.5	4.0	98.7
5	24.0	346	0.930	1.75	31.53	75	237	250	42	1.5	5.0	98.1
5	27.0	346	0.930	1.75	33.74	75	237	254	41	1.5	5.0	99.0
6	30.0	347	0.940	1.75	35.97	76	237	252	42	1.5	6.0	98.4
6	33.0	343	0.750	1.40	38.20	76	237	251	43	1.5	6.0	99.3
7	36.0	344	0.880	1.65	40.22	76	238	254	44	1.5	7.0	97.7
7	39.0	344	0.820	1.55	42.37	77	237	250	44	1.5	7.0	99.2
8	42.0	342	0.790	1.50	44.48	77	236	255	43	1.5	8.0	100.9
8	45.0	342	0.850	1.60	46.59	77	237	250	43	1.5	8.0	98.7
9	48.0	344	0.870	1.60	48.73	78	238	250	44	1.5	9.0	97.5
9	51.0	346	0.920	1.75	50.87	78	238	255	45	1.5	9.0	98.9
10	54.0	345	0.800	1.50	53.10	78	239	254	46	1.5	10.0	99.3
10	57.0	348	0.950	1.80	55.19	79	238	255	47	1.5	10.0	98.6
	60.0				57.45							
TRAVERSE NO. 2												
1	0.0	333	0.770	1.50	58.08	77	238	257	52	1.5	1.0	100.6
1	3.0	334	0.720	1.45	60.17	79	239	253	47	1.5	1.0	100.9
2	6.0	345	0.820	1.55	62.20	80	240	253	46	1.5	2.0	98.8
2	9.0	346	0.820	1.55	64.31	80	241	251	46	1.5	2.0	101.6
3	12.0	344	0.920	1.75	66.48	81	240	253	47	1.5	3.0	99.2
3	15.0	348	0.940	1.75	68.73	81	240	254	48	2.0	3.0	100.1
4	18.0	352	1.100	2.00	71.02	82	240	252	49	2.0	4.0	98.3
4	21.0	354	1.100	2.00	73.45	82	240	254	50	2.0	4.0	97.6
5	24.0	355	1.100	2.00	75.86	83	240	252	51	2.0	5.0	97.2
5	27.0	358	1.100	2.05	78.26	83	240	252	48	2.0	5.0	99.0
6	30.0	356	0.700	1.40	80.70	83	240	250	47	2.0	6.0	101.8
6	33.0	357	0.690	1.25	82.71	83	240	251	48	2.0	6.0	99.6
7	36.0	354	0.730	1.35	84.66	83	240	253	49	2.0	7.0	99.2

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 95 11 24
RUN : T14-MP-A
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	358	0.620	1.20	86.66	83	240	251	48	2.0	7.0	100.7
8	42.0	356	0.650	1.20	88.53	83	241	252	49	2.0	8.0	98.8
8	45.0	355	0.640	1.20	90.41	83	241	253	49	2.0	8.0	98.9
9	48.0	356	0.650	1.20	92.28	83	240	250	49	2.0	9.0	98.2
9	51.0	351	0.600	1.10	94.15	83	240	254	49	2.0	9.0	98.6
10	54.0	352	0.670	1.20	95.96	83	240	252	50	2.0	10.0	97.0
10	57.0	351	0.670	1.20	97.84	84	240	251	50	2.0	10.0	97.9
	60.0				99.74							
		348	0.832	1.57		78	239	253	46	1.6		99.2

ISOKINETIC TEST DATA FORM

Sample Type: M5 Reference Method: EPA M29 Page 1 of 5

Client:	R&O H&O	City, Province:	Layton, Utah
Project Number:	5416265	Test Number:	T14-MP-A
Sample Location:	B Stack	Date:	95 11 24
Start Time:	8:47	Finish Time:	11:17
Barometric Press. (in Hg):	25.5 "Hg.	Stack Press(in H_2O): + or -:	-.5
Stack Diameter (in.):	53	Length x Width:	____ x ____
Stack Height (ft):	116	Cyclonic Flow:	Yes ____ No ✓

Sample Box Number:	T3	Gas Meter Factor:	1.006	Calibration Date:	Sept 95
Nozzle I.D.:	Q2	Nozzle Diameter (in.):	0.244	Calibration Date:	Nov 95
Probe I.D.:	T1-7'	Pitot Coefficient:	~~.789~~ .798 ✓	Calibration Date:	Sept 95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%):	9.4	O_2 (%):	10.6
CO (ppm):	____	Other:	____
Impinger 1 (g)	202.9	Assumed H_2O (%):	16
Impinger 2 (g)	51.7	Filter I.D. #:	____
Impinger 3 (g)	9.4	Net Filter Wt. (g):	____
Impinger 4 (g)	1.9	Net Probe Wash Wt. (g):	____
Impinger 5 (g)	0.5	Imp. Residue Wt. (g):	____
Impinger 6 (g)	0		
~~XAD-2 Trap~~ (g) S.G.	13.2		
Total H_2O Condensed (g)	279.6		

Sampling Comments: _____

Process Rate: Intermediate Temp.

Control Equipment Operation: ESP

Process Comments: _____

Signature: _____ Date: 95 11 24

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	R & R
Date:	95.11.24	Test:	T14-MPA
Sample Location:	Stack B	Filter I.D.:	ZENON → 102511
Pre Weights by:	JH	Post Weights by:	

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	703.3	500.4	202.9 ✓
2	5% HNO_3 10% H_2O_2	623.9	572.2	51.7 ✓
3	5% HNO_3 10% H_2O_2	636.9	627.0	9.4 ✓
4	Blank	493.6	491.7	1.9 ✓
5	$KMnO_4$	593.2	592.7	0.5 ✓
6	$KMnO_4$	602.5	602.5	0 ✓
7	S.G.	802.7	789.5	13.2 ✓
8				
XAD Trap				
			Total (g)	279.6 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights	255	295.3	✓	JH
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95.11.25

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BOVAR-CONCORD Environmental

DATE: 8/11/24 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Rigo + Rig 2 Project #: 5416265 Sample Location: B Stack Operators: JD/SM

Run #: T14-MP-A Traverse #: 1 Traverse Direction: IN Start Time: 8:47 Finish Time: 9:47

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		.88	1.75		14.087	345	236	255	45	MA	69	67	1.0
1	3		0.80	1.5	16.768	16.30	344	236	249	41		73	67	1.0
2	6		0.91	1.75	+18.379	18.41	346	237	254	40		74	68	1.0
2	9		0.86	1.65	20.627	20.64	346	239	252	39		76	69	1.0
3	12		0.90	1.7	+22.796	22.80	345	237	253	39		76	69	1.0
3	15		0.95	1.75	25.005	25.00	347	237	253	40		77	70	1.5
4	18		0.92	1.7	+27.266	27.24	348	237	253	40		77	71	1.5
4	21		0.82	1.5	29.47	29.44	345	237	255	41		78	71	1.5
5	24		0.93	1.75	+31.545	31.53	346	237	250	42		78	72	1.5
5	27		0.93	1.75	33.772	33.74	346	237	254	41		78	72	1.5
6	30		0.94	1.75	+35.982	35.97	347	237	252	42		79	72	1.5
6	33		0.75	1.4	38.224	38.20	343	237	251	43		79	73	1.5
7	36		0.88	1.65	+40.213	40.22	344	238	254	44		79	73	1.5

Pre test leak check: Rate (cfm) .011 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .02 at 17 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

DATE: 9/11/24 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Rio + Rio Project #: 5416265 Sample Location: B Stack Operators: JW/JM

Run #: T14-mp-A Traverse #: 1 Traverse Direction: IN Start Time: 8:47 Finish Time: 9:47

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F) N/A	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	39		0.82	1.55	42.401	42.37	344	237	250	44		80	74	1.5
9	42		0.79	1.5	*44.475	44.48	342	236	255	43		80	74	1.5
8	45		0.85	1.6	46.546	46.59	342	237	250	43		80	74	1.5
9	48		0.87	1.6	*48.733	48.73	344	238	250	44		81	75	1.5
9	51		0.92	1.75	50.899	50.87	346	238	255	45		81	75	1.5
10	54		0.80	1.5	*53.10	53.10	345	239	254	46		81	75	1.5
10	57		0.95	1.8	55.179	55.19	348	238	255	47		82	76	1.5
10	LA				57.456	57.448								

Pre test leak check: Rate (cfm) .011 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .012 at 17 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: JW

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BOVAR-CONCORD Environmental

DATE: 95 / 11 / 24 SAMPLING TRAINS DATA SHEET PAGE 4 OF 5

Client: Riso Hayo Project #: 5416205 Sample Location: B Stack Operators: JW/JM

Run #: TH-MP-A Traverse #: 2 Traverse Direction: IN Start Time: 10:17 Finish Time: 11:17

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		0.77	1.5		58.082	333	238	257	52	NA	78	76	1.5
1	3		0.72	1.40	60.122	60.17	334	239	253	47		81	76	1.5
2	6		0.82	1.55	62.142	62.20	345	240	253	46		82	77	1.5
2	9		0.82	1.55	64.305	64.31	346	241	251	46		82	77	1.5
3	12		0.92	1.75	66.945	66.48	344	240	253	47		83	78	1.5
3	15		0.94	1.75	68.71	68.73	348	240	254	48		84	78	2.0
4	18		1.1	2.0	70.984	70.02	352	240	252	49		85	79	2.0
4	21		1.1	2.0	73.458	73.45	354	240	254	50		85	79	2.0
5	24		1.1	2.0	75.880	75.86	355	240	252	51		85	80	2.0
5	27		1.1	2.05	78.298	78.26	358	240	252	48		85	80	2.0
6	30		0.70	1.4	80.698	80.70	356	240	250	47		86	80	2.0
6	33		0.69	1.25	82.645	82.71	357	240	251	48		85	80	2.0
7	36		0.73	1.35	84.641	84.66	354	240	253	49		85	80	2.0

Pre test leak check: Rate (cfm) .01 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .010 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 05/11/24

SAMPLING TRAINS DATA SHEET

Client: Rego-Hayo | Project #: 5416265 | Sample Location: B Stack | Operators: JW/JM

Run #: TH-mp-A | Traverse #: 2 | Traverse Direction: IN | Start Time: 10:17 | Finish Time: 11:12

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	39		0.62	1.2	86.646	86.646	358	240	257	48		85	81	2.0
8	42		0.65	1.2	88.49	88.53	356	241	252	49		85	81	2.0
8	45		0.64	1.2	90.404	90.41	355	241	253	49		85	81	2.0
9	48		0.65	1.2	92.270	92.28	356	240	250	49		85	81	2.0
9	51		0.60	1.1	94.154	94.15	357	240	254	49		85	81	2.0
10	54		0.67	1.2	95.950	95.96	352	240	252	50		85	81	2.0
10	57		0.67	1.2	97.863	97.84	357	240	257	50		86	81	2.0
10	60				99.743	99.744								

Pre test leak check: Rate (cfm) .010 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) .010 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

PROJECT # 5416265 DATE: 95/1/24 TEST T14-MP-A

Client: Rigoffigo Location: B Stack Operator: JW

Sample Type: MS Reference Method: EPA M29

Modifications:

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	⟷	
Static positive or negative	⟷	Neg.
Average Temperature	⟷	
Estimate % H_2O	⟷	16
How estimated?	⟷	
Estimate Gas Composition	⟷	O_2% ___ CO_2(%) ___ CO(ppm) ___
How Estimated?	⟷	
Proper nozzle selected?	✓	
K factor	⟷	
Number of sampling points per traverse	⟷	10
Probe markings correct?	✓	
Time per point	⟷	6
Number of readings per point	⟷	2
Barometric Pressure Measured?	✓	
Mercury		
Aneroid		
Other		Watch
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or		
Quartz	✓	
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or		
Quartz or	✓	
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 5916265 DATE: 95/1/24 TEST T14-MP-A

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	⟷	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor		
Thermocouple	✓	
Type		K
Temp. checked against ambient temp		
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL	✓	
Silicone		
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre		
Quartz	✓	
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	✓	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol	N/A	
Thermocouple attached to trap		
XAD-2 Trap covered with foil at all times		

PROJECT # 5416265 DATE: 11/24 TEST T14-MP-A

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	
IMPINGERS		
No. of Impingers	7	
Contents #1		
#2		
#3		
#4		
#5		
#6		
Impinger weights recorded	✓	
Impingers properly assembled		
Recirculating pump set up properly		
Modifications		
Grease used on joints		
Silica gel type		
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate		.011 cfm@ 15 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	X	
Sorbent trap kept at ≤68°F	NA	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel		
Leak checks at port changes Before		.012 cfm@ 17 "Hg
After		.010 cfm@ 15 "Hg
Final leak race acceptable		.010 cfm@ 15 "Hg
General comments on sampling technique		
Sample recovery performed on-site?		
Sample recovery performed by		
Clean-up area - General Environment		
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 5416265 DATE: 11/24 TEST F14-MP-A

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material		teflon
Leak free	✓	
Petri Dishes: borosilicate glass		
plastic	✓	
Balance Type		digital toploader
Calibrated or QC checked		Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		pink/blue.
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		
Colour of Filter		
Foil Wrapped?		
Probe Rinses		
Acetone		
Other		
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents		
Solvents		
Resin		
Blank Train		
Samples labelled and stored properly		
Liquid levels marked		
Samples delivered to lab		

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: Stack B TEST #: T14-MP-A DATE: 95-11-2~~4~~ PROJECT NO.: 54B265

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	**Container TS3 Front Half 0.1 N HNO3 Rinse** Final Wt.: 256.3 Initial Wt.: 189.2 Gain: 70.1 Comments:	Brush loose particulate onto filter	**Container TS4-1 Impinger 4 Contents** Final Wt.: 832.4 Initial Wt.: 341.9 Gain: 490.5	**Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse** Final Wt.: 639.6 Initial Wt.: 343.1 Gain: 296.5 Colour:	Rinse with 100 mL 0.1 N HNO3	Rinse 3x with 100 mL Acidified KMnO4	Place rinsing in Container 5C which contains 200 mL of water	
Container TS2 Front Half Acetone Rinse Final Wt.: 390.1 Initial Wt.: 264.1 Gain: 126.0 Comments:		**Filter TS2** Seal petri dish with tape Colour: GREY Filter #:			**Container T5A Impinger 4 Contents** Final Wt.: 345.1 Initial Wt.: 188.7 Gain: 156.4	Rinse with 100 mL water	**Container 5C HCL Rinse** Final Wt.: 580.1 Initial Wt.: 345.9 Gain: 234.2 Colour:	
						Container 5B Impinger 5 & 6 KMnO4 Content and Rinses Final Wt.: 795.2 Initial Wt.: 346.9 Gain: 448.3 Colour:		

(TIM) PORTION OF FILTER IN PROBE WASH

Train Identification	Blanks
Train No.:	
HNO3 / H2O2 Batch No.:	Container 9 200 mLs
DI Water Batch No.:	Container 8B 100 mLs
Acetone Batch No.:	Container 7 100 mLs
0.1 N HNO3 Batch No.:	Container 8A 300 mLs
Acidified KMnO4 Batch No.:	Container 10 100 mLs
8 N HCl / Batch No.: DI Water	Container 11 25 mL / 200 mL
Filter Number:	Container 12 * _____

Mark Liquid Level on Containers
Seal and Label Containers
Reagent Blanks Submitted? Yes ✓ No ____
Prepare Fresh Acidified KMnO4 Daily ✓

BOVAR-CONCORD Environmental

METHOD 26
HCl SAMPLING DATA FORM

Company Name	[illegible]	Plant Location	Layton Utah	Source Name	B Stack
Test Date	951124	Test Number	T16-HCl-B	Job Number	5416265
Sampling for	HCl	Meter Box	Vost Box	B.P. mm/inHg	865 mm

ABSORBING $SOL^{'N}$	15 ml 0.1 N H_2SO_4	15 ml 0.1 N H_2SO_4	15 ml 0.1 N NaOH	15 ml 0.1 N NaOH	Silica Gel	GAS	1	2	3	4
WEIGHTS	IMP 1	IMP 2	IMP 3	IMP 4	IMP 5	READINGS				
EMPTY						O2				
FILLED FINAL						CO2				
FILLED INITIAL						CO				
DIFFERENCE						TIME				

OPERATOR	JM	Sample Rate (Lpm)	2.0	H20 Condensed	
Lk.Chk, (Init.)	0 cc/min	Lk. Chk. (Final)	0 cc/min	Probe Purged	(Yes ✓ No)

Sample Time	Clock Time	Volume ~~m³~~ L Desired	Volume ~~m³~~ L Actual	Vacuum in.Hg	Meter Temp. °C/°F	Probe Temp. °C/°F	Box Temp. °C/°F	Impinger Temp. °C/°F
0	17:05		1891.33	1.0	60	252	227	
~~10~~ 5	17:10		1901.2	1	60	222	230	
~~20~~ 10	17:15		1910.65	1	61.5	321	232	
~~30~~ 15	17:20		1920.4	1	61	230	240	
~~40~~ 20	17:25		1930.45	1	63	310	244	
~~50~~ 25	17:30		1940.65	1	62.5	231	247	
~~60~~ 30	17:35		1950.7	1	64	301	249	
~~70~~ 35	17:40		1960.8	1	63	225	257	
~~80~~ 40	17:45		1971.0	1	63	302	247	
~~90~~ 45	17:50		1981.15	1	63	227	242	
~~100~~ 50	17:55		1991.3	1	64	247	239	
~~110~~ 55	18:00		2001.5	1	63.5	228	238	
~~120~~ 60	18:05		2011.4	1	64.5	285	234	
		TOT/AVG	120.07	1	62.5	264	259	

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120.07 ✓

4.244 ft³

BOVAR-CONCORD Environmental

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	R&R
Date:	95-11-19	Test:	T16-HCC-B
Sample Location:	Stack B	Filter I.D.:	—
Pre Weights by:	VP	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	Blank	94.5	85.9	8.6 ✓
2	0.1 N H_2SO_4	99.6	95.4	4.2 ✓
3	0.1 N H_2SO_4	106.0	106.1	-0.1 ✓
4	Blank	71.2	70.9	0.3 ✓
5	0.1 N NaOH	99.1	98.9	0.2 ✓
6	0.1 N NaOH	98.8	97.7	1.4 ✓
7	SG	122.2	121.2	1.0 ✓
8				
XAD Trap				
			Total (g)	15.6 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: _____

Signature: _____ Date: 95-11-24

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BOVAR-CONCORD Environmental

HCl METHOD 26 SAMPLING TRAIN
RECOVERY DATA FORM

PROJECT NO.: 5416265

LOCATION: STACK B TEST #: T16-HCl-B DATE: 95.11.29

Impingers 1 and 2	Impingers 3 and 4
Weigh impingers Empty contents into container and rinse with DI water	Weigh impingers Empty contents into container and rinse with DI water

Container TS1 Impingers 1 and 2 0.1 N H2SO4 Contents and DI Water Rinses		Container TS2 Impingers 3 and 4 0.1 N NaOH Contents and DI Water Rinses	
Final Wt.:	133.7	Final Wt.:	133.2
Initial Wt.:	33.7	Initial Wt.:	33.2
Gain:	100.0	Gain:	100.0

76.2 64.8

Mark Liquid Level	Seal and Label
✓	✓

Train Identification	
Train No.:	
0.1 N H2SO4 Batch No.:	Zenon
DI Water Batch No.:	Zenon
0.1 N NaOH Batch No.:	Zenon
Train Loaded By:	JA
Recovered By:	JA
Reagent Blank Submitted: Yes ✓	No ____

SYSTEM CALIBRATION AND DRIFT CALCULATIONS

CLIENT	RIGO+RIGO	DATE	NOV24/95
PROJECT NUMBER	5416265	TIME START	12:09
SAMPLE LOCATION	STACK	TIME FINISH	16:46
	TEST NUMBER	T15CEMB	

INSTRUMENT SPAN VALUES

OXYGEN	25	%	CARBON DIOXIDE	20	%
SULPHUR DIOXIDE	1000	PPM	CARBON MONOXIDE	1000	PPM
NITROGEN OXIDES	1000	PPM	TOTAL HYDROCARBONS	100	PPM

ITEM	CAL.GAS VALUE	ANAL. CAL.	INITIAL VALUES SYSTEM CAL.	INITIAL VALUES SYSTEM CAL. BIAS (% SPAN)	FINAL VALUES SYSTEM CAL.	FINAL VALUES SYSTEM CAL. BIAS (% SPAN)	DRIFT (% SPAN)
O2 ZERO	0	0.03	0.03	0.0	0.07	0.2	0.2
O2 CAL	9.91	9.9	9.97	0.3	9.93	0.1	-0.2
SO2 ZERO	0	-0.4	0.5	0.1	0.4	0.1	-0.0
SO2 SPAN	149	150	143	-0.7	140	-1.0	-0.3
NOX ZERO	0	2.7	3.5	0.1	2.9	0.0	-0.1
NOX SPAN	302	302	305	0.3	304	0.2	-0.1
CO2 ZERO	0	0.03	0.06	0.2	0.07	0.2	0.1
CO2 SPAN	7.01	7.04	7.03	-0.0	6.96	-0.4	-0.4
CO ZERO	0	0.9	0.9	0.0	0.9	0.0	0.0
CO SPAN	100	100.4	100.4	0.0	100	-0.0	-0.0
THC ZERO	0	0.23	0.6	0.4	-0.6	-0.8	-1.2
THC SPAN	20.1	21.6	21.5	-0.1	20.6	-1.0	-0.9

DRIFT CRITERIA <5% SPAN
BIAS CRITERIA <5% SPAN

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO	DATE : 11-24-95
JOBSITE : LAYTON UTAH	RUN : T15-OC-B
REF.No. : 5416265	LOC. : B STACK

RUN TIME : 14:00 TO 16:40

ORGANICS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
ORGANICS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	1.7369 DSm3	61.332 DScf
AVERAGE ISOKINETICITY	101.1 %	

FLUE GAS CHARACTERISTICS

MOISTURE		16.83 %	
TEMPERATURE		177.7 deg C	351.8 deg F
FLOW		46431 DSm3/hr	27329 DScfm
		98765 Am3/hr	58131 Acfm
VELOCITY		19.27 m/s	3794.3 fpm
GAS ANALYSIS	O2	10.50 %	
	CO2	9.50 %	
	CO	0.00 %	
	SO2	0.00 %	
	MOL. WT.	30.05 g/gmole D.B.	
	MOL. WT.	28.02 g/gmole W.B.	

*STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-24-95
RUN : T15-OC-B
LOC. : B STACK

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.7 kPa	25.60 in.Hg
STATIC PRESSURE	-112.1 Pa	-0.45 in.H2O
NOZZLE DIAMETER	5.79 mm	0.2280 in.
PITOT COEFFICIENT	0.796	
METER CORRECTION FACTOR	0.983	

CONDENSATE COLLECTION

RESIN TRAP CONDENSATE	0.6 g
CONDENSATION IN IMPINGER 1	234.3 g
CONDENSATION IN IMPINGER 2	4.0 g
CONDENSATION IN IMPINGER 3	1.9 g
CONDENSATION IN IMPINGER 4	0.7 g
SILICA GEL WEIGHT GAIN	17.1 g
TOTAL MOISTURE GAIN	258.6 g

ORGANICS COLLECTION

FILTER ORGANICS	0.0000 mg
WASHINGS ORGANICS	0.0000 mg
RESIN ORGANICS	0.0000 mg
IMPINGER ORGANICS	0.0000 mg
TOTAL ORGANICS	0.0000 mg

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-24-95
RUN : T15-OC-B
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1													
1	0.0	350	0.600	0.80	16.88	81	250	254	50	59	4.0	1.0	100.8
1	3.0	351	0.600	0.80	18.50	82	251	250	50	50	5.0	1.0	100.0
2	6.0	351	0.500	0.70	20.11	82	256	248	50	48	5.0	2.0	100.7
2	9.0	352	0.550	0.75	21.59	83	252	250	51	48	5.0	2.0	102.5
3	12.0	355	0.600	0.80	23.17	83	251	250	50	48	6.0	3.0	100.7
3	15.0	355	0.600	0.80	24.79	83	251	249	51	48	5.0	3.0	99.4
4	18.0	354	0.500	0.70	26.39	84	253	250	49	49	5.0	4.0	103.9
4	21.0	353	0.500	0.70	27.92	84	253	250	49	49	5.0	4.0	103.1
5	24.0	353	0.550	0.72	29.44	83	253	250	51	51	5.0	5.0	102.4
5	27.0	354	0.550	0.70	31.02	84	253	250	51	50	5.0	5.0	101.0
6	30.0	352	0.850	1.20	32.58	84	253	250	52	51	7.0	6.0	102.2
6	33.0	354	0.900	1.35	34.54	83	253	250	52	51	7.0	6.0	102.6
7	36.0	355	0.910	1.30	36.56	83	252	249	53	51	7.0	7.0	101.1
7	39.0	355	0.910	1.30	38.56	84	253	252	54	53	7.0	7.0	100.0
8	42.0	348	0.760	1.05	40.54	84	251	249	55	53	6.0	8.0	100.1
8	45.0	349	0.800	1.10	42.36	83	252	248	55	53	6.0	8.0	101.0
9	48.0	342	0.680	0.90	44.24	83	251	249	55	54	6.0	9.0	98.5
9	51.0	340	0.680	0.92	45.94	83	251	251	56	53	6.0	9.0	101.8
10	54.0	328	0.500	0.68	47.70	82	250	250	57	53	5.0	10.0	100.6
10	57.0	330	0.550	0.75	49.20	82	251	250	59	54	5.0	10.0	101.2
	60.0				50.78								
TRAVERSE NO. 2													
1	0.0	356	1.000	1.45	51.81	80	248	250	68	62	7.0	1.0	101.0
1	3.0	355	0.900	1.30	53.89	81	249	249	62	54	7.0	1.0	102.1
2	6.0	354	0.900	1.30	55.89	82	250	248	58	53	7.0	2.0	102.4
2	9.0	355	0.960	1.35	57.90	82	251	250	51	53	7.0	2.0	101.1
3	12.0	357	1.000	1.45	59.95	82	251	250	48	53	7.0	3.0	102.1
3	15.0	357	1.000	1.40	62.06	83	252	248	48	54	7.0	3.0	101.5
4	18.0	357	0.980	1.40	64.16	83	251	249	48	55	7.0	4.0	102.5
4	21.0	360	1.100	1.50	66.26	83	252	249	48	54	7.0	4.0	100.7
5	24.0	357	0.840	1.20	68.44	83	251	250	48	55	7.0	5.0	101.6
5	27.0	356	0.840	1.20	70.37	83	252	250	49	56	7.0	5.0	100.5
6	30.0	357	0.960	1.35	72.28	83	253	249	49	55	7.0	6.0	100.5
6	33.0	357	0.900	1.30	74.32	83	253	249	48	56	7.0	6.0	102.8
7	36.0	356	0.900	1.30	76.34	84	252	250	48	56	7.0	7.0	100.5

AIR TESTING SERVICES INC. ORGANICS EMISSION REPORT

CLIENT : RIGO & RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11-24-95
RUN : T15-OC-B
LOC. : B STACK

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	RES. TMP. F	EXIT TMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	356	0.920	1.30	78.32	84	252	251	49	55	7.0	7.0	101.4
8	42.0	354	0.830	1.20	80.34	85	253	250	49	55	7.0	8.0	100.7
8	45.0	355	0.920	1.30	82.25	84	252	251	49	55	7.0	8.0	100.3
9	48.0	357	0.920	1.30	84.25	85	252	250	49	55	7.0	9.0	99.3
9	51.0	354	0.750	1.10	86.23	85	252	249	51	55	6.0	9.0	101.4
10	54.0	340	0.700	0.95	88.06	85	251	249	51	55	6.0	10.0	98.9
10	57.0	340	0.600	0.80	89.80	85	251	249	51	55	5.0	10.0	98.9
	60.0				91.41								
		352	0.765	1.09		83	252	250	52	53	6.2		101.1

ISOKINETIC TEST DATA FORM

Sample Type: Organics Reference Method: EPA M23 Page 1 of 5

Client:	Rigo & Rigo	City, Province:	Layton, UTAH
Project Number:	5416267	Test Number:	T15-OCB
Sample Location:	B Stack	Date:	Nov 24/95
Start Time:	14:00	Finish Time:	16:40
Barometric Press. (in Hg):	~~0.45~~ 25.6	Stack Press(in H_2O):+ or -:	-0.45
Stack Diameter (in.):	53	Length x Width:	— x —
Stack Height (ft):	116	Cyclonic Flow:	Yes (No)

Sample Box Number:	T1	Gas Meter Factor:	0.983	Calibration Date:	Sept 19/95
Nozzle I.D.:	T1-2	Nozzle Diameter (in.):	0.220	Calibration Date:	Nov 16/95
Probe I.D.:	T2-7	Pitot Coefficient:	0.796	Calibration Date:	Sept/95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): 9.5	O_2 (%): 10.5	CO (ppm): _____	Other: _____
Impinger 1 (g)	234.3	Assumed H_2O (%):	16
Impinger 2 (g)	4.0	Filter I.D. #:	—
Impinger 3 (g)	1.9	Net Filter Wt. (g):	—
Impinger 4 (g)	0.7	Net Probe Wash Wt. (g):	—
Impinger 5 (g) S.G.	17.1	Imp. Residue Wt. (g):	—
~~Impinger 6 (g)~~ Condenser	0.0		
XAD-2 Trap (g)	0.6		
Total H_2O Condensed (g)	258.6		

Sampling Comments: Train 04 (reused after T9-OCB)
Trap 16

Process Rate: _____

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: Nov 24/95

MOISTURE ANALYSIS DATA SHEET

Project #:	5416265	Client:	Rigo & Rigo
Date:	Nov 24/95	Test:	TIS - OCB
Sample Location:	B Stack	Filter I.D.:	—
Pre Weights by:	HVB	Post Weights by:	HVB

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	MT	660.9	426.6	234.3 ✓
2	RODI	639.5	635.5	4.0 ✓
3	RODI	632.7	630.8	1.9 ✓
4	MT	486.3	485.6	0.7 ✓
~~5~~ S.G.	S.G.	729.8	712.7	17.1 ✓
6				
7				
~~8~~ Condenser		244.8	244.8	0.0 ✓
XAD Trap		323.9	323.3	0.6 ✓
			Total (g)	258.6 ✓

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights				
Post weights				

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: Train 04 (reused after T9-OCB)
Trap # 16

Signature: [signature]

Date: Nov 24/95

DATE: 11/24/95 SAMPLING TRAINS DATA SHEET PAGE 2 OF 5

Client: Rigs + Rigs Project #: 5416265 Sample Location: B Stack Operators: HWB / JM

Run #: T15-OCB Traverse #: 1 Traverse Direction: North Start Time: 14:00 Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		0.60	0.80	.541	16.88	350	250	254	59	50	81	80	4
	3		0.60	0.80	.541	18.50	351	251	250	50	50	83	81	5
2	6		0.50	0.7	.494	20.11	351	256	248	48	50	83	81	5
	9		0.55	0.75	.518	21.59	352	252	250	48	51	84	81	5
3	12		0.60	0.80	.541	23.17	355	251	250	48	50	85	81	6
	15		0.60	0.80	.541	24.79	355	251	249	48	51	85	81	5
4	18		0.50	0.7	.494	26.39	354	253	250	49	49	86	82	5
	21		0.50	0.7	.494	27.92	353	253	250	49	49	86	82	5
5	24		0.55	0.72	.518	29.44	353	253	250	51	51	85	81	5
	27		0.55	0.7	.518	31.02	354	253	250	50	51	86	82	5
6	30		0.65	1.2	.644	32.58	352	253	250	51	52	86	81	7
	33		0.90	1.35	.663	34.54	354	253	250	51	52	85	81	7

Pre test leak check: Rate (cfm) 0.006 at 16 inches Hg (Vacuum) Leak Volume Start: 16.60 Leak Volume End: 16.88

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: HWB

DATE: 11/24/95 SAMPLING TRAINS DATA SHEET PAGE 3 OF 5

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: NUR JJM

Run #: T15-0CB Traverse #: 1 Traverse Direction: North Start Time: _____ Finish Time: 15:00

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.91	1.3	.666	36.56	355	252	249	51	53	85	81	7
	39		0.91	1.3	.666	38.56	355	253	252	53	54	86	81	7
8	42		0.76	1.05	.609	40.54	348	251	249	53	55	86	81	6
	45		0.80	1.1	.625	42.36	349	252	248	53	55	85	80	6
9	48		0.68	0.9	.576	44.24	342	251	249	54	55	85	81	6
	51		0.68	0.92	.576	45.94	340	251	251	53	56	85	81	6
10	54		0.50	0.68	.502	47.70	328	250	250	53	57	84	80	5
	57		0.55	0.75	.527	49.20	330	251	250	54	59	84	80	5
	60					50.78								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.01 at 15 inches Hg (Vacuum) Leak Volume Start: 50.78 Leak Volume End: 51.06

K value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

DATE: 11/24/95 **SAMPLING TRAINS DATA SHEET**

Client: Rigo+Rigo Project #: 5416265 Sample Location: B Stack Operators: NVB/JM

Run #: T15-OCB Traverse #: 2 Traverse Direction: East Start Time: 15:40 Finish Time: ______

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
1	0		1.0	1.45	.698	51.81	356	248	250	62	68	80	79	7
	3		0.90	1.3	.663	53.89	355	249	249	54	62	82	79	7
2	6		0.90	1.3	.663	55.89	354	250	248	53	58	83	80	7
	9		0.96	1.35	.684	57.90	355	251	250	53	51	84	80	7
3	12		1.0	1.45	.698	59.95	357	251	250	53	48	84	80	7
	15		1.0	1.4	.698	62.06	357	252	248	54	48	85	80	7
4	18		0.98	1.4	.691	64.16	357	251	249	55	48	85	80	7
	21		1.1	1.5	.732	66.26	360	252	249	54	48	85	80	7
5	24		0.84	1.2	.640	68.44	357	251	250	55	48	86	80	7
	27		0.84	1.2	.640	70.37	356	252	250	56	49	86	80	7
6	30		0.96	1.35	.684	72.28	357	253	249	55	49	86	80	7
	33		0.90	1.3	.663	74.32	357	253	249	56	48	86	80	7

Pre test leak check: Rate (cfm) .012 at 15 inches Hg (Vacuum) Leak Volume Start: 51.06 Leak Volume End: ~~8~~51.807

Post test leak check: Rate (cfm) ______ at ______ inches Hg (Vacuum) Leak Volume Start: ______ Leak Volume End: ______

K value calculated by: ______ Checked by: ______ Operator Signature: [signature]

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BOVAR-CONCORD Environmental

~~NOTE~~
in 851.06
fin 851.32
fin 851807

DATE: 11/24/95 SAMPLING TRAINS DATA SHEET PAGE 5 OF 5

Client: Rigo + Rigo Project #: 5416265 Sample Location: B Stack Operators: HUB / JM

Run #: T15-0CB Traverse #: 2 Traverse Direction: East Start Time: _____ Finish Time: 16:40

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
7	36		0.90	1.3	.663	76.34	356	252	250	56	48	87	81	7
	39		0.92	1.3	.670	78.32	356	252	251	55	49	87	81	7
8	42		0.93	1.2	.636	80.34	354	253	250	55	49	88	81	7
	45		0.92	1.3	.670	82.25	355	252	251	55	49	87	81	7
9	48		0.92	1.3	.670	84.25	357	252	250	55	49	88	82	7
	51		0.75	1.1	.605	86.23	354	252	249	55	51	88	82	6
10	54		0.70	0.95	.584	88.06	340	251	249	55	51	88	82	6
	57		0.60	0.80	.541	89.80	340	251	249	55	51	87	82	5
	60					91.41								

Pre test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) 0.038 at 15 inches Hg (Vacuum) Leak Volume Start: 91.41 Leak Volume End: 91.59

Cp value calculated by: _____ Checked by: _____ Operator Signature: _____

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: Nov 24/95 TEST T15-OCB

Client: Rigo & Rigo Location: B Stack Operator: HVB

Sample Type: Organics Reference Method: EPA M23

Modifications: Train recovery following Env. Canada, train rinse w/ acetone/DCM, train proving w/ toluene

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?	✓	
Avg. ΔP	---	
Static positive or negative	---	-ve
Average Temperature	---	350 °F
Estimate % H_2O	---	14
How estimated?	---	Previous tests
Estimate Gas Composition	---	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	---	CEM data
Proper nozzle selected?	✓	
K factor	---	
Number of sampling points per traverse	---	10
Probe markings correct?	✓	
Time per point	---	6
Number of readings per point	---	2
Barometric Pressure Measured?		
Mercury		
Aneroid		
Other	✓	watch
PROBE NOZZLE:		
Nickel plated stainless steel or	✓	
Stainless Steel or		
Glass or		
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	Proving rinse after T14-OCA
Round ? Undamaged?		
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	Proving rinse after T14-OCA
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

PROJECT # 541625 DATE: Nov 24/95 TEST T15-OCB

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	→	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor	✓	
Thermocouple	✓	
Type		K
Temp. checked against ambient temp	✓	
FILTER HOLDER		
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		
Other		
GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	Pouring of Train 04 after T9-OCB
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	X	
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass	✓	
Cleaned according to protocol	✓	Pouring of Train 04 after T9-OCB
Thermocouple attached to trap	✓	
XAD-2 Trap covered with foil at all times	✓	

PROJECT # 5416265 DATE: Nov 24/95 TEST TI5-OCB

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	✓	Plowing / Train 04 after TG-OCB
IMPINGERS		
No. of Impingers	⟷	5
Contents #1	⟷	MT
#2	⟷	RODI
#3	⟷	RODI
#4	⟷	MT
#5	⟷	S.G.
~~#6~~	⟷	
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly	✓	
Modifications	⟷	
Grease used on joints	X	
Silica gel type	⟷	
New?	✓	
Used?		
Pre Test Leak Check		
Performed	✓	
Rate	⟷	0.006 cfm@ 16 "Hg.
All openings of sampling train sealed	✓	
Is nozzle sealed when probe is in stack with pump off	✓	
Is care taken to avoid scraping nipple or stackwall	✓	
Effective seal around probe when in-stack	✓	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run	X	
Any particulate lost during filter change	✓	
Sorbent trap kept at ≤68°F	✓	
Probe temperature 250 ± 25°F	✓	
Filter box temperature 250 ± 25°F	✓	
Data forms completed and data recorded properly	✓	
Ice level checked	✓	
Condition of silica gel	⟷	
Leak checks at port changes Before	⟷	0.01 cfm@ 15 "Hg
After	⟷	0.012 cfm@ 15 "Hg
Final leak race acceptable	⟷	0.009 cfm@ 15 "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?	✓	
Sample recovery performed by	⟷	RB/JA
Clean-up area - General Environment	⟷	Clean (Trailer on-site)
Brushes: Nylon bristle		
Other	✓	
Wash Bottles: Glass		

PROJECT # 5416265 DATE: Nov 24/95 TEST T15-OCB

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	⟷	Teflon
Leak free	✓	
Petri Dishes: borosilicate glass		filter in cleaned foil in
plastic		plastic bag
Balance Type	⟷	top loader
Calibrated or QC checked	⟷	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered		
Silica Gel		
Condition/Colour	✓	25% spent
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		[illegible]
Colour of Filter		[illegible]
Foil Wrapped?		[illegible]
Probe Rinses		
Acetone DCM	✓	
Other [illegible]	✓	
Particulate Recovered from		
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents	✓	
Resin	✓	
Blank Train	✓	
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

#17

EPS 1/RM/2
SEMI-VOLATILE ORGANIC (SVOC) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: B-Stack TEST #: TS-OC-B DATE: Nov 24/95 PROJECT NO.: 541-6265

Nozzle, Probe Liner Front Half Filter Holder #11 Container	Filter	Back Half Filter Holder and Condenser Coil	XAD Resin	Impingers & ~~HPLC~~ Rinse RossI	Back Half Rinse
DCM Wash and brush 3x each with ~~hexane~~ and acetone. DCM Rinse 3x with ~~hexane~~ and and acetone.	Remove and place on pre-cleaned foil fold in half and place in ~~petri~~dish. Zip Loc bag	**Weigh Coil & Record Weight** Soak 5 minutes each with hexane and acetone. Rinse 3x with ~~hexane~~ DCM and acetone.	**Weigh XAD Trap & Record Weight** Cap ends and wrap in foil.	Weigh impingers and record wts. Empty contents of #1, #2 and #3 into container #4. ~~Rinse 3x with HPLC water~~	Rinse back half filter holder, condenser and impingers 1, 2 and 3 3x with hexane and acetone.

DCM **Container ~~TS1~~ TS2 Front Half Acetone ~~Hexane~~ Rinse**		**Container ~~TS2~~ TS1 Filter**		**Container TS3 Back Half Filter and Condenser Coil**		**Container TS4 XAD Resin**	**Container TS5 Impinger Contents**		**Container TS6 Back Half Rinse**	
Final Wt.:	466.0	Filter ID:	TS-OC	Final Wt.:	453.2	**Wrap in Foil**	Final Wt.:	805.4	Final Wt.:	
Initial Wt.:	263.1	Colour:	White	Initial Wt.:	262.6	XAD: 046632	Initial Wt.:	263.8	Initial Wt.:	
Gain:	192.9			Gain:	190.6	Colour: White Trap 16	Gain:	541.6	Gain:	
				Colour:	Clear		Colour:	Clear	Colour:	

Mark Fluid Levels Seal and Label

Train & Proofing Identification	
Train No.:	04
RossI ~~HPLC~~ Batch No.:	Tedlar 95/10/24
Acetone Batch No.:	Caledon 14123
DCM ~~Hexane~~ Batch No.:	Caledon 16700
Filter Batch No.:	Tedlar 95/10/24 XAD No.: Trap 16
Train Assembled By:	HVB
Train Recovered By:	RB

Reagent Blanks Collected?	Yes
Combined Acetone/~~Hexane~~ DCM	Yes
~~Combined Glycol~~/Water	Yes
Blank Train Collected?	Yes
Comments:	

EPSREC.DRW-May 95

BOVAR-CONCORD Environmental

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.24.95
RUN : T15-MP-B
LOC. : STACK B

RUN TIME : 14:00 TO 16:40

METALS CONCENTRATION	0.0 ug/DSm3	0.0000 gr/1000 DScf
	0.0 ug/Am3	0.0000 gr/1000 Acf
METALS EMISSION RATE	0.000 mg/s	0.00 gr/hr
SAMPLE GAS VOLUME	2.0018 DSm3	70.684 DScf
AVERAGE ISOKINETICITY	98.6 %	

FLUE GAS CHARACTERISTICS

MOISTURE	16.62 %	
TEMPERATURE	176.6 deg C	349.8 deg F
FLOW	47909 DSm3/hr	28198 DScfm
	101404 Am3/hr	59685 Acfm
VELOCITY	19.79 m/s	3895.7 fpm

GAS ANALYSIS	O2	10.50 %
	CO2	9.50 %
	CO	0.00 %
	SO2	0.00 %
	MOL. WT.	30.05 g/gmole D.B.
	MOL. WT.	28.05 g/gmole W.B.

STANDARD CONDITIONS : METRIC 25 deg C, 101.3 kPa
: IMPERIAL 77 deg F, 29.92 in.Hg

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO	DATE : 11.24.95
JOBSITE : LAYTON UTAH	RUN : T15-MP-B
REF.No. : 5416265	LOC. : STACK B

STACK HEIGHT	35.4 m	116.0 ft.
STACK DIAMETER	1.35 m	53.0 in.
STACK AREA	1.423 m2	15.32 sq.ft.
BAROMETRIC PRESSURE	86.7 kPa	25.60 in.Hg
STATIC PRESSURE	-112.1 Pa	-0.45 in.H2O
NOZZLE DIAMETER	6.20 mm	0.2440 in.
PITOT COEFFICIENT	0.798	
METER CORRECTION FACTOR	1.006	

CONDENSATE COLLECTION

CONDENSATION IN IMPINGER 1	164.9 g
CONDENSATION IN IMPINGER 2	84.2 g
CONDENSATION IN IMPINGER 3	21.6 g
CONDENSATION IN IMPINGER 4	3.3 g
CONDENSATION IN IMPINGER 5	1.4 g
CONDENSATION IN IMPINGER 6	-0.9 g
SILICA GEL WEIGHT GAIN	19.1 g
TOTAL MOISTURE GAIN	293.6 g

METALS COLLECTION

FILTER METALS	0.0000 mg
WASHINGS METALS	0.0000 mg
IMPINGER METALS	0.0000 mg
TOTAL METALS	0.0000 mg

TOTAL SAMPLING TIME 120.0 min.

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.24.95
RUN : T15-MP-B
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
TRAVERSE NO. 1												
1	0.0	347	0.770	1.50	0.80	78	239	259	63	1.0	1.0	104.1
1	3.0	348	0.680	1.25	2.92	79	238	249	51	1.0	1.0	98.2
2	6.0	347	0.710	1.30	4.80	79	237	259	51	1.0	2.0	98.5
2	9.0	352	0.830	1.60	6.73	80	237	254	50	1.0	2.0	98.5
3	12.0	354	0.920	1.75	8.81	80	236	249	50	1.0	3.0	100.3
3	15.0	354	0.900	1.65	11.04	81	236	251	49	1.0	3.0	97.2
4	18.0	353	0.930	1.80	13.18	82	235	255	50	1.0	4.0	100.4
4	21.0	353	0.800	1.55	15.43	82	236	259	51	1.0	4.0	100.8
5	24.0	352	0.940	1.90	17.53	83	236	245	53	1.0	5.0	101.8
5	27.0	353	0.900	1.65	19.83	84	236	255	54	1.0	5.0	98.0
6	30.0	352	0.900	1.65	22.00	84	236	250	55	1.0	6.0	97.5
6	33.0	352	1.100	2.00	24.16	84	236	251	55	1.0	6.0	96.3
7	36.0	355	0.900	1.65	26.52	85	236	249	55	1.0	7.0	97.9
7	39.0	354	0.820	1.55	28.69	85	234	250	55	1.0	7.0	99.2
8	42.0	351	0.840	1.60	30.79	86	235	250	55	1.0	8.0	98.6
8	45.0	352	0.890	1.65	32.91	86	235	239	56	1.0	8.0	96.3
9	48.0	352	0.820	1.60	35.04	86	236	252	55	1.0	9.0	100.3
9	51.0	350	0.800	1.50	37.17	86	236	247	55	1.0	9.0	98.5
10	54.0	349	0.730	1.35	39.24	86	236	249	55	1.0	10.0	98.0
10	57.0	349	0.840	1.60	41.21	86	236	248	55	1.0	10.0	98.4
	60.0				43.33							
TRAVERSE NO. 2												
1	0.0	329	0.650	1.20	44.09	83	239	262	57	1.0	1.0	91.1
1	3.0	329	0.580	1.10	45.83	84	240	264	55	1.0	1.0	98.5
2	6.0	328	0.650	1.25	47.61	84	240	261	54	1.0	2.0	98.1
2	9.0	335	0.720	1.35	49.49	85	241	261	52	1.0	2.0	98.1
3	12.0	338	0.990	1.90	51.46	85	240	261	51	1.0	3.0	93.3
3	15.0	350	1.050	2.05	53.65	86	240	263	49	1.0	3.0	104.5
4	18.0	350	1.100	2.05	56.16	86	240	261	49	1.0	4.0	98.4
4	21.0	358	1.200	2.20	58.58	86	241	262	50	1.0	4.0	98.6
5	24.0	357	0.900	1.65	61.10	87	241	261	50	1.0	5.0	98.1
5	27.0	355	0.970	1.85	63.28	87	241	261	51	1.0	5.0	98.8
6	30.0	355	0.870	1.60	65.56	87	241	261	51	1.0	6.0	98.8
6	33.0	355	0.800	1.50	67.72	87	241	262	52	1.0	6.0	98.2
7	36.0	355	0.590	1.10	69.78	87	241	261	53	1.0	7.0	100.9

AIR TESTING SERVICES INC. METALS EMISSION REPORT

CLIENT : RIGO AND RIGO
JOBSITE : LAYTON UTAH
REF.No. : 5416265

DATE : 11.24.95
RUN : T15-MP-B
LOC. : STACK B

PT. NO.	TIME min.	STACK TEMP. F	VEL. PRES. in.H2O	ORIF. PRES. in.H2O	METER VOL. cu.ft.	MTR. TMP. F	PROB. TEMP. F	OVEN TEMP. F	EXIT TEMP. F	PUMP VAC. in.Hg	WALL DIST. in.	% ISO.
7	39.0	354	0.600	1.10	71.60	87	241	261	53	1.0	7.0	97.8
8	42.0	353	0.560	1.05	73.38	87	241	261	53	1.0	8.0	99.5
8	45.0	354	0.630	1.15	75.13	87	242	262	53	1.0	8.0	91.2
9	48.0	355	0.720	1.35	76.83	87	241	260	53	1.0	9.0	102.0
9	51.0	353	0.580	1.05	78.86	87	241	261	53	1.0	9.0	99.3
10	54.0	350	0.650	1.25	80.64	87	240	261	53	1.0	10.0	100.0
10	57.0	350	0.660	1.25	82.54	87	241	262	53	1.0	10.0	98.7
	60.0				84.43							
		350	0.805	1.53		84	238	256	53	1.0		98.6

ISOKINETIC TEST DATA FORM

Sample Type: METALS Reference Method: EPA M29 Page 1 of 6

Client:	RIGO & RIGO	City, Province:	CANYON UTAH
Project Number:	5416.265	Test Number:	NOV 24/95
Sample Location:	STACK B	Date:	TIS-MP-B
Start Time:	14:00	Finish Time:	16:40
Barometric Press. (in Hg):	866 mbar 25.6 in Hg	Stack Press(in H_2O): + or -:	-.45
Stack Diameter (in.):	53	Length x Width:	___ x ___
Stack Height (ft):	116	Cyclonic Flow:	Yes No

Sample Box Number:	T3	Gas Meter Factor:	1.006	Calibration Date:	SEPT 95
Nozzle I.D.:	02	Nozzle Diameter (in.):	.244	Calibration Date:	NOV 95
Probe I.D.:	T1-7'	Pitot Coefficient:	~~.789~~ .798	Calibration Date:	SEPT 95

Equipment Comments: _____

STACK GAS COMPOSITION

CO_2 (%): 9.5 0_2 (%): 10.5 CO (ppm): _____ Other: _____

Impinger 1 (g)	164.9	Assumed H_2O (%):	16
Impinger 2 (g)	84.7	Filter I.D. #:	1625 12
Impinger 3 (g)	21.6	Net Filter Wt. (g):	___
Impinger 4 (g)	3.3	Net Probe Wash Wt. (g):	___
Impinger 5 (g)	1.4	Imp. Residue Wt. (g):	___
Impinger 6 (g)	-0.9		
XAD-2 Trap (g)	19.1		
Total H_2O Condensed (g)	293.6 ml		

Sampling Comments: _____

Process Rate: _____

Control Equipment Operation: _____

Process Comments: _____

Signature: _____ Date: NOV 24/95

MOISTURE ANALYSIS DATA SHEET

Project #:	5916265	Client:	R & C
Date:	95-11-25	Test:	T15-MP-B
Sample Location:	Stack B	Filter I.D.:	102542 Zenn 102542
Pre Weights by:	JA	Post Weights by:	JA

Impinger #	Impinger Contents	Final Wt. (g)	Initial Wt. (g)	Net Condensate (g)
1	5% Blank	634.5	469.6	164.9
2	5% HNO_3 10% H_2O_2	668.3	584.1	84.2
3	5% HNO_3 10% H_2O_2	635.7	614.1	21.6
4	Blank	496.4	493.1	3.3
5	$KMnO_4$	582.4	581.0	1.4
6	$KMnO_4$	599.1	600.0	-0.9
7	SG	823.4	804.3	19.1
8				
XAD Trap				
			Total (g)	293.6

BALANCE QC CHECK

	Actual (g) (A)	Measured (g) (M)	<10%	Initials
Pre weights			✓	
Post weights				JA

$$\frac{A - M}{A} \times 100 \quad <10\%$$

Comments: ______

Signature: [signature]

Date: 95.11.25

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BOVAR-CONCORD Environmental

DATE: 11/24/95

SAMPLING TRAINS DATA SHEET

Client: R160 & R150 Project #: 5416265 Sample Location: STACK B Operators: KM

Run #: T15-MM-B Traverse #: 1 Traverse Direction: N Start Time: 1400 Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		.77	1.5		100.80	347	239	259	63	N/A	78	78	1
	3		.68	1.25	102.84	102.92	348	238	249	51		79	78	1
2	6		.71	1.3	104.837	104.80	347	237	259	51		80	78	1
	9		.83	1.6	106.759	106.73	352	237	254	50		81	78	1
3	12		.92	1.75	108.848	108.815	354	236	249	50		82	78	1
	15		.9	1.65	111.045	111.04	354	236	251	49		83	78	1
4	18		.93	1.8	113.245	113.18	353	235	255	50		84	79	1
	21		.8	1.55	115.422	115.425	353	236	259	51		85	79	1
5	24		.94	1.9	117.504	117.53	352	236	245	53		85	80	1
	27		.9	1.65	119.784	119.83	353	236	255	54		86	80	1
6	30		.9	1.65	122.035	122.0	352	236	250	55		86	81	1
	33		1.1	2	124.205	124.16	352	236	257	55		87	81	1
7	36		.9	1.65	126.598	126.52	355	236	249	55		87	81	1

Pre test leak check: Rate (cfm) .002 at 15 inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: _____

DATE: 11/24/95 SAMPLING TRAINS DATA SHEET PAGE 2 OF 4

Client: RigotRigo Project #: SH1624S Sample Location: Stack B Operators: JW/JTY

Run #: T15-17P-B Traverse #: 1 Traverse Direction: In Start Time: ______ Finish Time: 18:00

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
	39		.82	1.55	128.725	128.69	354	234	250	55		88	82	1
8	42		.84	1.6	130.795	130.79	357	235	250	55		88	82	1
	45		.89	1.65	132.92	132.91	352	235	239	56		88	83	1
9	48		.82	1.6	135.103	135.04	352	236	252	55		89	83	1
	51		.8	1.5	137.145	137.17	350	236	247	55		89	83	1
10	54		.73	1.35	139.249	139.24	349	236	249	55		89	83	1
	57		.84	1.6	141.226	141.21	349	236	248	55		89	83	1
	60				143.34	143.33								

Pre test leak check: Rate (cfm) .002 at 15 inches Hg (Vacuum) Leak Volume Start: 143.517 Leak Volume End: 143.519

Post test leak check: Rate (cfm) ______ at ______ inches Hg (Vacuum) Leak Volume Start: [crossed out] Leak Volume End: ______

K value calculated by: ______ Checked by: ______ Operator Signature: [signature]

 BOVAR-CONCORD Environmental

DATE: 11/24/95

SAMPLING TRAINS DATA SHEET

Client: Rio Grande Project #: 5416265 Sample Location: STACK B Operators: JM

Run #: T15 MP-3 Traverse #: 2 Traverse Direction: E Start Time: 15:40 Finish Time: _____

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading		Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
					Desired (ft^3)	Actual (ft^3)								
1	0		.65	1.2		144.085	329	239	262	57		83	82	1
	3		.58	1.1	145.989	145.83	329	240	264	55		85	82	1
2	6		.65	1.25	147.628	147.61	328	240	261	54		86	82	1
	9		.72	1.35	149.484	149.49	335	241	261	52		87	82	1
3	12		.99	1.9	151.462	151.46	338	240	261	51		87	82	1
	15		1.05	2.05	153.773	153.65	350	240	263	49		88	83	1
4	18		1.1	2.05	156.03	156.16	350	240	261	49		86	83	1
	21		1.2	2.2	158.598	158.58	358	241	262	50		89	83	1
5	24		.9	1.65	161.127	161.1	357	241	261	50		89	84	1
	27		.97	1.85	163.305	163.28	355	241	261	51		89	84	1
6	30		.87	1.6	165.569	165.56	355	241	261	51		89	84	1
	33		.8	1.5	167.728	167.72	355	241	262	52		89	84	1

Pre test leak check: Rate (cfm) .002 at 15 inches Hg (Vacuum) Leak Volume Start: 143.65 Leak Volume End: 143.984

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: JM

143.65

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BOVAR-CONCORD Environmental

DATE: 11/21/95 SAMPLING TRAINS DATA SHEET PAGE 4 OF 4

Client: R160 & R160 Project #: 5416265 Sample Location: STACK B Operators: JM

Run #: T15-MP-B 7/13 Traverse #: 2 Traverse Direction: ~~E~~ E Start Time: _____ Finish Time: 16:40

Pt.	Time (Min.)	O_2 (%)	Vel. Press. (ΔP)	Orifice Press. (ΔH)	Gas Meter Reading Desired (ft^3)	Gas Meter Reading Actual (ft^3)	Stack Temp. (°F)	Probe Temp. (°F)	Box Temp. (°F)	Imp. Temp. (°F)	XAD Temp. (°F)	Meter Inlet (°F)	Meter Outlet (°F)	Vac. in Hg
7	36		.59	1.1	169.799	169.78	355	241	261	53		89	84	1
	39		.6	1.1	171.565	171.6	354	241	261	53		89	84	1
8	42		.56	1.06	173.4	173.38	353	241	261	53		89	84	1
	45		.63	1.15	175.119	175.13	354	242	262	53		89	84	1
9	48		.72	1.35	176.975	176.83	355	241	260	53		89	84	1
	51		.58	1.05	178.802	178.86	353	241	261	53		89	85	1
10	54		.65	1.25	180.63	180.64	350	240	261	53		89	85	1
	57		.66	1.25	182.514	182.54	350	241	262	53		89	85	1
	60				184.428	184.427								

Post test leak check: Rate (cfm) .002 at 17 inches Hg (Vacuum) Leak Volume Start: 184.427 Leak Volume End: 184.78

Post test leak check: Rate (cfm) _____ at _____ inches Hg (Vacuum) Leak Volume Start: _____ Leak Volume End: _____

K value calculated by: _____ Checked by: _____ Operator Signature: JM

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BOVAR-CONCORD Environmental

PROJECT # 5416265 DATE: NOV 24/95 TEST T15-MP-13

Client: RIGO & RIGO Location: STACK B Operator: JM

Sample Type: METALS Reference Method: (EPA Methods)

Modifications: _____

ITEM	✓	COMMENTS
PRELIMINARY DATA		
Was preliminary velocity profile performed?		PREV TEST
Avg. ΔP	←→	
Static positive or negative	←→	NEG
Average Temperature	←→	
Estimate % H_2O	←→	16
How estimated?	←→	
Estimate Gas Composition	←→	O_2% 10 CO_2(%) 10 CO(ppm) ___
How Estimated?	←→	(CEM)
Proper nozzle selected?	✓	
K factor	←→	.775
Number of sampling points per traverse	←→	10
Probe markings correct?	✓	
Time per point	←→	CONSTANT
Number of readings per point	←→	2
Barometric Pressure Measured?	✓	
Mercury		
Aneroid		
Other	✓	WATCH
PROBE NOZZLE:		
Nickel plated stainless steel or		
Stainless Steel or		
Glass or	✓	
Quartz		
Button Hook or	✓	
Elbow		
Cleaned according to protocol	✓	
Round ? Undamaged?	✓	
PROBE LINER:		
Borosilicate or	✓	
Quartz or		
Other		
Cleaned according to protocol	✓	
PROBE HEATING SYSTEM:		
Checked	✓	
Temperature 250 ± 25°F	✓	
Stable	✓	

QA/QC CHECKLIST

PROJECT # 5411625 DATE: Nov 24 TEST T15-MP-B

ITEM	✓	COMMENTS
PITOT TUBE/METER BOX		
Type "S" or	✓	
Other		
Properly attached to probe (no interference with nozzle)	✓	
Modifications	---	
Connected to:		
inclined manometer	✓	
magnehilic gauge		Range: _____ Division: _____
micromanometer		Range: _____
Pitot lines checked for leak	✓	
Pitot pressure gauge zeroed	✓	
Orifice pressure gauge zeroed	✓	
Meter box levelled	✓	
Gas Temperature Sensor		
Thermocouple	✓	
Type		K
Borosilicate glass	✓	
Other		
FRIT MATERIAL		
Teflon	✓	
Borosilicate glass		

GASKET MATERIAL		
Silicone	✓	
Other		
Filter assembly cleaned according to Protocol	✓	
FILTER TYPE		
Glass Fibre	✓	
Quartz		
Other		
Filter checked visually for irregularities	✓	
Filter centered properly	✓	
Filter labelled	XS	Should be Are you sure
Filter heated	✓	
Temperature (250 ± 25°F)	✓	
CONDENSER/XAD-2 TRAP		
Glass		
Cleaned according to protocol		NA
Thermocouple attached to trap		
XAD-2 Trap covered with foil at all times		

PROJECT # 5916265 DATE: NOV 20 / 95 TEST T15-MP-B

ITEM	✓	COMMENTS
GLASSWARE		
Cleaned and proofed according to protocol	/	
IMPINGERS		
No. of Impingers	⟷	7
Contents #1	⟷	Blank
#2	⟷	5% HNO_3 10% H_2O_2
#3	⟷	5% HNO_3 10% H_2O_2
#4	⟷	Blank
#5	⟷	KMnO4
#6	⟷	KMnO4 #1 S.G.
Impinger weights recorded	✓	
Impingers properly assembled	✓	
Recirculating pump set up properly		
Modifications	⟷	
Grease used on joints	✓	
Silica gel type	⟷	
New?	✓	
Used?		
Pre Test Leak Check		
Performed	/	
Rate	⟷	.002 cfm@ 15 "Hg.
All openings of sampling train sealed	/	
Is nozzle sealed when probe is in stack with pump off	/	
Is care taken to avoid scraping nipple or stackwall	/	
Effective seal around probe when in-stack	/	
Probe moved to traverse point at right time	✓	
Nozzle and pitot tube kept parallel to stack at all times	✓	
Filters changed during run		NO
Any particulate lost during filter change		NO
Sorbent trap kept at ≤68°F		NA
Probe temperature 250 ± 25°F	/	
Filter box temperature 250 ± 25°F	/	
Data forms completed and data recorded properly	/	
Ice level checked	/	
Condition of silica gel	⟷	GOOD
Leak checks at port changes Before	⟷	.002 cfm@ 15 "Hg
After	⟷	.002 cfm@ 15 "Hg
Final leak race acceptable	⟷	.002 cfm@ 17 "Hg
General comments on sampling technique	⟷	
Sample recovery performed on-site?		YES
Sample recovery performed by	⟷	(J Adams)
Clean-up area - General Environment	⟷	CLEAN
Brushes: Nylon bristle	✓	
Other		
Wash Bottles: Glass		

PROJECT # 541626S DATE: NOV24/96 TEST T15-MP-B

ITEM	✓	COMMENTS
Teflon	✓	
Polyethylene		
Other		
Storage Containers:		
Borosilicate glass	✓	
Polyethylene		
Cap Material	⟷	TEFLON
Leak free	✓	
Petri Dishes: borosilicate glass		
plastic	✓	
Balance Type	⟷	TOP LOADER
Calibrated or QC checked	⟷	Actual _____ (g) Measured _____ (g)
Probe allowed to cool sufficiently	✓	
Probe and sample train openings covered	✓	
Silica Gel		
Condition/Colour		NEW/BLUE
Weighed	✓	
Filter Handling		
Tweezers used?	✓	
Condition?		
Colour of Filter		WHITE
Foil Wrapped?	(X)	NOT TARE
Probe Rinses		
Acetone	✓	
Other	✓	0.1 NITRIC
Particulate Recovered from	✓	
probe/nozzle	✓	
probe fitting	✓	
probe liner	✓	
front half filter holder	✓	
Impingers		
Recovered according to protocol	✓	
Weighted	✓	
H_2O/Recovery data sheet completed	✓	
Blanks Collected		
Reagents	✓	
Solvents		
Resin		
Blank Train		
Samples labelled and stored properly	✓	
Liquid levels marked	✓	
Samples delivered to lab	✓	

T15-mp-B

EPA METHOD 29
METALS / PARTICULATE (MP) SAMPLING TRAIN
RECOVERY DATA FORM

LOCATION: Stack B TEST #: _____ DATE: 95-11-28 PROJECT NO.: 5416265

Probe Liner, Nozzle Front Half Filter Housing	Probe Liner, Nozzle Front Half Filter Housing	Filter	Impingers 1, 2, 3	Back Half Filter Holder Filter Support	Impinger 4	Impinger 5, 6	Impinger 5, 6	Impinger 7
Brush and rinse with 100 mL acetone	Rinse with 100 mL 0.1 N HNO3	Carefully remove filter from support with Teflon-coated tweezers and place in petri dish	Weigh impingers empty contents into container	Rinse back half filter holder filter support and rinse empty impingers with 100 mL 0.1 N HNO3	weigh impinger empty contents into container 5A	Weigh impingers empty contents into container 5B	Rinse with 25 mL 8 N HCL	Weigh impinger and discard or recycle silica gel
Check visually to see if particulate is removed if not repeat step above	Container TS3 Front Half 0.1 N HNO3 Rinse Final Wt.: 256.9 Initial Wt.: 188.2 Gain: 68.7 Comments:	Brush loose particulate onto filter	Container TS4-1 Impinger 4 Contents Final Wt.: 831.9 Initial Wt.: 345.0 Gain: 486.9	Container TS4-2 0.1 N HNO3 Back Half Impinger Rinse Final Wt.: 630.6 Initial Wt.: 334.8 Gain: 295.8 Colour:	Rinse with 100 mL 0.1 N HNO3	Rinse 3x with 100 mL Acidified KMnO4	Place rinsing in Container 5C which contains 200 mL of water	
Container TS2 Front Half Acetone Rinse Final Wt.: 386.3 Initial Wt.: 262.9 Gain: 123.4 Comments:		Filter TS2 Seal petri dish with tape Colour: ~~BLK~~ GREY Filter #: 735			Container TSA Impinger 4 Contents Final Wt.: 345.1 Initial Wt.: 188.4 Gain: 156.7	Rinse with 100 mL water	Container 5C HCL Rinse Final Wt.: 579.5 Initial Wt.: 345.3 Gain: 234.2 Colour:	
						Container 5B Impinger 5 & 6 KMnO4 Content and Rinses Final Wt.: 794.0 Initial Wt.: 345.0 Gain: 449.0 Colour:		

portion of TEFLON 102512 filter in probe wash.

Train Identification	Blanks
Train No.:	
HNO3 / H2O2 Batch No.:	Container 9 200 mLs
DI Water Batch No.:	Container 8B 100 mLs
Acetone Batch No.:	Container 7 100 mLs
0.1 N HNO3 Batch No.:	Container 8A 300 mLs
Acidified KMnO4 Batch No.:	Container 10 100 mLs
8 N HCl / Batch No.: DI Water	Container 11 25 mL / 200 mL
Filter Number:	Container 12 * _____

Mark Liquid Level on Containers
Seal and Label Containers
Reagent Blanks Submitted? Yes ✓ No ____
Prepare Fresh Acidified KMnO4 Daily ✓

M29REC.DRW-May 95

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REPORT DOCUMENTATION PAGE

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13. ABSTRACT (Maximum 200 words)
Many municipal waste combustion facilities are equipped with electrostatic precipitators (ESPs); few have acid gas control systems. A retrofit technology using water spray temperature reduction combined with dry acid gas control reagent and powdered activatedcarbon (PAC) injection was tested. 2000 mg/dsm^3 @ 7%O_2 (150 ib/hr) of trona (a natural sodium sesquicarbonate ore) injected through a rapid dispersion lance successfully controlled more than 50% of the acid gases. This should let facilities under 250 TPD meet the small plant guidelines for acid gas control. Various levels of PAC were injected along with the trona. 300 mg/dsm^3 @ 7% O_2 of PAC provides a comfortable margin between the emissions limitations achieved and both large and small plant regulatory guidelines for tetra-through octa-chlorinated dibenzo-p-dioxins and dibenzofurans and mercury, when ESP is operated below 350°F. Bi-fluid nozzles were used to spray finely atomized water between the economizer outlet and ESP inlet to maintain temperatures in the desired 300-350°F range. Particulate and metals emissios limitations were met by this 400 ft^2/1000acft^2 specific collector area (SCA)m 3-field ESP. Both the water sprays and PAC improved ESP performance. The proof-of-concept demonstration was successful.

14. SUBJECT TERMS

Municipal waste combustion, electrostatic precipitators, water spray, powdered activated carbon injection

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