I. INTRODUCTION

INTRODUCTION

On November 7 & 8, 1994, AIRx Testing performed source emission tests for Total and PM-10 particulate matter on the Lint Cleaner and Dryer #1 Cyclones. The cyclones are located at Elbow Enterprises, 12021 Avenue 328, Visalia, California. Sampling was done in triplicate for total particulate and PM-10 particule size distribution. Production rates, in bales per hour, were taken by Elbow personnel. No problems were incountered during the sampling. The exhaust stacks were candy canes attached to the top of the cyclones and continued in a vertical position. The testing was conducted with two (2) ports. The Lint Cleaner Cyclone duct was 30 inches in diameter and the ports were located 72 inches upstream and 240 inches downstream from the nearest disturbance. A total of 12 sample points were taken (6 per port). The Dryer #1 cyclone was 26 inches in diameter and the ports were located 50 inches upstream and 240 inches downstream from the nearest disturbance. A total of 12 sample points were taken (6 per port).

SAMPLING AND ANALYTICAL PROCEDURES

STACK GAS ANALYSIS: The oxygen and carbon dioxide content of the exhaust gases were assumed to be ambient air. Oxygen = 20.9% and Carbon Dioxide = 0.05%.

STACK GAS VELOCITY: The stack gas velocity was determined using an "S" type pitot tube connected to a magnehelic gauge. The "S" type pitot was used to determine the stack velocity profile for each run. A total of 12 (6 points per port) traverse points were utilized on each duct.

The stack temperature was determined using a thermocouple and an indicating pyrometer. The proportion of water was determined gravimetrically and the dry molecular weight of the stack gas determined by E.P.A. Method 3. Stack velocities and gas volumetric flow rate were calculated using E.P.A. Method 2.

TOTAL PARTICULATE EMISSIONS: A CARB Method 5 sampling train was utilized to determine the total particulate emission from the cyclones. The sample train consisted of a stainless steel nozzle, a heated stainless steel probe, a heated glass fiber filter and cooled impingers. After the weight is obtained from the filter, probe and nozzle rinses; the total solids in the impingers is added to the front-end catch to satisfy SJVUAPCD rules.

PARTICULE SIZE DISTRIBUTION: A sample was taken isokinetically from the stack using a GII cascade impactor. A modified CARB Method 501 was utilized. The impactor consisted of two (2) slotted discs, a back up filter and cooled impingers. The noxxle, preseparator cyclone and the first two (2) discs are +10µ and the backup filter, probe and impingers are -10µ. The total weights obtained from each fraction were added together to obtain the total particulate weight. The total weight was used to determine the % of the +10µ and the -10µ fraction. The total weight obtained from the total particulate runs are used to determine the +10µ and the -10µ results reported in grains/dscf, lb/hr and lb/bale.

LEAK CHECKS: Leak rates were conducted on the sampling train and the pitot tubes before and after each test. The leak check for the sampling train was done at the nozzle. Any leak rate greater than 0.02 cfm was corrected for in the volume calculations.

All calculations for lb/hr were done by using the flow rate of the stack gas. All values were calculated by using SJVUAPCD standard conditions (60^0F & 29.92 in Hg).

All glassware was inspected before and after each run to insure that no breakage had occured during the sampling. No problems were encountered during the sampling.

If you have any questions concerning the above results please contact the undersigned at 805-644-1099.

Respectfully submitted,
AIRx Testing

Tom Porter
Partner

cc California Cotton Ginners Association
Attn: Roger Isom

PARTICULATE EMISSION SUMMARY

DRYER #1 CYCLONE (1 of 3)

	Run #1	Run #2	Run #3	Average
Total Particulate				
gr/DSCF	0.0893	0.0817	0.0720	*0.0810*
lb/hr	3.95	3.60	3.42	*3.66*
lb/bale	0.10	0.09	0.11	*0.10*
Particule Size Distribution				
+10μ (%)	69.8	79.9	62.1	*70.6*
+10μ (lb/hr)	2.76	2.87	2.12	*2.58* ?
+10μ (lb/bale)	0.07	0.07	0.07	*<0.01* ?
-10μ (%)	30.2	20.1	37.9	*29.4*
-10μ (lb/hr)	1.19	0.72	1.30	*1.07*
-10μ (lb/bale)	0.03 OK	0.02 OK	0.04 OK	*0.03* OK
Average Bales/hr	41.0	40.5	31.2	*37.6*

LINT CLEANER CYCLONE (1 of 12)

	Run #1	Run #2	Run #3	Average
Total Particulate				
gr/DSCF	0.0155	0.0172	0.0145	*0.0157*
lb/hr	1.32	1.47	1.25	*1.35*
lb/bale	0.03	0.04	0.03	*0.03*
Particule Size Distribution				
+10μ (%)	71.6	73.1	72.3	*72.3*
+10μ (lb/hr)	0.94	1.07	0.90	*0.97*
+10μ (lb/bale)	0.02	0.03	0.02	*0.02*
-10μ (%)	28.4	26.9	27.7	*27.7*
-10μ (lb/hr)	0.37	0.39	0.35	*0.37*
-10μ (lb/bale)	0.01 OK	0.01 OK	0.01 OK	*0.01* OK
Average Bales/hr	42.7	38.2	42.6	*41.2*

FIELD DATA SUMMARY
TOTAL PARTICULATE
DRYER #1 CYCLONE

	Run#1	Run#2	Run#3
Vlc - Volume of water collected, ml	9.4	0.0	0.0
Vm - Gas volume, meter cond., dcf	37.572	37.920	42.917
Y - Meter calibration factor	0.972	0.972	0.972
Pbar - Barometric pressure, in. Hg	29.65	29.65	29.65
Pg - Stack static pressure, in. H20	-0.15	-0.15	-0.15
ΔH - Avg. meter press. diff., in. H20	1.381	1.321	1.585
Tm - Absolute meter temperature, °R	531.6	539.8	540.7
Vm(std) - Standard sample gas vol., dscf	35.5340	35.3126	39.9273
Bws - Water vapor part in gas stream	1.2	0.0	0.0
CO2 - Dry concentration, volume %	0.1	0.1	0.1
O2 - Dry concentration, volume %	20.9	20.9	20.9
Md - Mol wt. stack gas, dry, g/gmole	28.844	28.844	28.844
Ms - Mol wt. stack gas, wet, g/gmole	28.712	28.844	28.844
Cp - Pitot tube coef., dimensionless	0.833	0.833	0.833
Δp - Avg. of sq. roots of each Δp	0.449	0.444	0.481
Ts - Absolute stack Temp. °R	572.3	574.3	580.7
A - Area of stack, square feet	3.69	3.69	3.69
Qstd - Volumetric flow rate, dscfm	5159	5140	5541
An - Area of nozzel, square feet	0.0004276	0.0004276	0.0004276
ø - Sampling time, minutes	60	60	60
I - Isokinetic variation, percent	99.0	98.7	103.5

FIELD DATA SUMMARY
PM10 PARTICULATE
DRYER #1 CYCLONE

	Run#1	Run#2	Run#3
Vlc - Volume of water collected, ml	--	--	--
Vm - Gas volume, meter cond., dcf	33.204	33.482	33.765
Y - Meter calibration factor	0.972	0.972	0.972
Pbar - Barometric pressure, in. Hg	29.65	29.65	29.65
Pg - Stack static pressure, in. H2O	-0.15	-0.15	-0.15
ΔH - Avg. meter press. diff., in. H2O	1.000	1.000	1.000
Tm - Absolute meter temperature, °R	523.5	538.9	539.5
Vm(std) - Standard sample gas vol., dscf	31.8578	31.2080	31.4353
Bws - Water vapor part in gas stream	1.2 X	0.0	0.0
CO2 - Dry concentration, volume %	0.1	0.1	0.1
O2 - Dry concentration, volume %	20.9	20.9	20.9
Md - Mol wt. stack gas, dry, g/gmole	28.844	28.844	28.844
Ms - Mol wt. stack gas, wet, g/gmole	28.712	28.844	28.844
Cp - Pitot tube coef., dimensionless	0.833	0.833	0.833
Δp - Avg. of sq. roots of each Δp	0.458	0.434	0.444
Ts - Absolute stack Temp. °R	601.3	581.2	585.0
A - Area of stack, square feet	3.69	3.69	3.69
Qstd - Volumetric flow rate, dscfm	5128	4995	5092
An - Area of nozzel, square feet	0.0004276	0.0004276	0.0004276
ø - Sampling time, minutes	60	60	60
I - Isokinetic variation, percent	89.3	89.8	88.7

Client: **Elbow**
Site: **Visalia**
Unit: **#1 Dryer**

Date: **11/7/94**
Type: ***T std = 60 F***
Run: **Run #1 PM-10**

FIELD DATA & CALCULATIONS SUMMARY

Vm	Metered Sample Gas Volume	**33.204**	**dcf**		
Lp	Avg. Leak Rate	0.000	cf		
Vn	Leak Corrected Sample Gas Volume	33.204	dcf		
Y	Dry Gas Meter Calibration Factor	**0.972**			
Pbar	Barometric Pressure	**29.65**	**in. Hg**		
Pg	Static Pressure	**-0.15**	**in. H20**		
Ps	Stack Pressure, Absolute	29.64	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	**1.000**	**in. H20**		
Tm	Dry Gas Meter Temperature, Average	63.5	deg. F	**523.5**	**deg. R**
Vm(std)	Sample Gas Volume	**31.8578**	**dscf**		
Vm(wet)	Sample Gas Volume, Wet	32.2500	scf		
Bws	Water Content of Stack Gas	**0.012**		**1.216**	**%**
CO2	Carbon Dioxide, Dry	**0.1**	**%**		
O2	Oxygen, Dry	**20.9**	**%**		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	**28.844**	**lb/lb mole**		
Ms	Molecular Wt. of Stack Gas, Wet	**28.712**	**lb/lb mole**		
Cp	Pitot Calibration Factor	**0.833**			
Del. P	Velocity Head, Average Square Root	**0.458**	**in. H20**		
Ts	Stack Gas Temperature, Average	**141.3**	deg. F	**601.3**	**deg. R**
As	Area of Stack	**3.69**	**sq ft**	26.0	in. dia.
Vs	Stack Gas Velocity	27.39	ft/sec		
Qa	Actual Flow Rate	6,059	cfm		
Qad	Actual Flow Rate, Dry	5,986	dcfm		
Q(std)	Stack Gas Flow Rate	**5,128**	**dscfm**		
An	Nozzle Area	**0.0004276**	**sq ft**	0.280	in. dia.
Theta	Sampling Time	**60**	**min.**		
I	Isokinetics	**89.29**	**%**		

Client: **Elbow**
Site: **Visalia**
Unit: **#1 Dryer**

Date: **11/7/94**
Type: ***T std = 60 F***
Run: **Run #2 PM-10**

FIELD DATA & CALCULATIONS SUMMARY

Vm	Metered Sample Gas Volume	**33.482**	**dcf**		
Lp	Avg. Leak Rate	0.000	cf		
Vn	Leak Corrected Sample Gas Volume	33.482	dcf		
Y	Dry Gas Meter Calibration Factor	**0.972**			
Pbar	Barometric Pressure	**29.65**	**in. Hg**		
Pg	Static Pressure	**-0.15**	**in. H20**		
Ps	Stack Pressure, Absolute	29.64	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	**1.000**	**in. H20**		
Tm	Dry Gas Meter Temperature, Average	78.9	deg. F	**538.9**	**deg. R**
Vm(std)	Sample Gas Volume	**31.2080**	**dscf**		
Vm(wet)	Sample Gas Volume, Wet	31.2080	scf		
Bws	Water Content of Stack Gas	**0.000**		**0.000**	**%**
CO2	Carbon Dioxide, Dry	**0.1**	**%**		
O2	Oxygen, Dry	**20.9**	**%**		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	**28.844**	**lb/lb mole**		
Ms	Molecular Wt. of Stack Gas, Wet	**28.844**	**lb/lb mole**		
Cp	Pitot Calibration Factor	**0.833**			
Del. P	Velocity Head, Average Square Root	**0.434**	**in. H20**		
Ts	Stack Gas Temperature, Average	**121.2**	deg. F	**581.2**	**deg. R**
As	Area of Stack	**3.69**	**sq ft**	26.0	in. dia.
Vs	Stack Gas Velocity	25.48	ft/sec		
Qa	Actual Flow Rate	5,636	cfm		
Qad	Actual Flow Rate, Dry	5,636	dcfm		
Q(std)	Stack Gas Flow Rate	**4,995**	**dscfm**		
An	Nozzle Area	**0.0004276**	**sq ft**	0.280	in. dia.
Theta	Sampling Time	**60**	**min.**		
I	Isokinetics	**89.78**	**%**		

Client: **Elbow**
Site: **Visalia**
Unit: **#1 Dryer**

Date: **11/7/94**
Type: ***T std = 60 F***
Run: **Run #3 PM-10**

FIELD DATA & CALCULATIONS SUMMARY

Vm	Metered Sample Gas Volume	**33.765**	**dcf**		
Lp	Avg. Leak Rate	0.004	cf		
Vn	Leak Corrected Sample Gas Volume	33.765	dcf		
Y	Dry Gas Meter Calibration Factor	**0.972**			
Pbar	Barometric Pressure	**29.65**	**in. Hg**		
Pg	Static Pressure	**-0.15**	**in. H20**		
Ps	Stack Pressure, Absolute	29.64	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	**1.000**	**in. H20**		
Tm	Dry Gas Meter Temperature, Average	79.5	deg. F	**539.5**	**deg. R**
Vm(std)	Sample Gas Volume	**31.4353**	**dscf**		
Vm(wet)	Sample Gas Volume, Wet	31.4353	scf		
Bws	Water Content of Stack Gas	**0.000**		**0.000**	**%**
CO2	Carbon Dioxide, Dry	**0.1**	**%**		
O2	Oxygen, Dry	**20.9**	**%**		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	**28.844**	**lb/lb mole**		
Ms	Molecular Wt. of Stack Gas, Wet	**28.844**	**lb/lb mole**		
Cp	Pitot Calibration Factor	**0.833**			
Del. P	Velocity Head, Average Square Root	**0.444**	**in. H20**		
Ts	Stack Gas Temperature, Average	**125.0**	deg. F	**585.0**	**deg. R**
As	Area of Stack	**3.69**	**sq ft**	26.0	in. dia.
Vs	Stack Gas Velocity	26.14	ft/sec		
Qa	Actual Flow Rate	5,783	cfm		
Qad	Actual Flow Rate, Dry	5,783	dcfm		
Q(std)	Stack Gas Flow Rate	**5,092**	**dscfm**		
An	Nozzle Area	**0.0004276**	**sq ft**	0.280	in. dia.
Theta	Sampling Time	**60**	**min.**		
I	Isokinetics	**88.72**	**%**		

Client: **Elbow Gin**
Site: **Visalia**
Unit: **#1 Dryer**

Date: **11/7/94**
Type: ***T std = 60 F***
Run: **1**

FIELD DATA & CALCULATIONS SUMMARY

Wlc	Water Condensate Weight	9.4	g		
Vlc	Water Condensate Volume	**9.4**	**ml**		
Vm	Metered Sample Gas Volume	**37.572**	**dcf**		
Lp	Avg. Leak Rate	0.003	cf		
Vn	Leak Corrected Sample Gas Volume	37.572	dcf		
Y	Dry Gas Meter Calibration Factor	**0.972**			
Pbar	Barometric Pressure	**29.65**	**in. Hg**		
Pg	Static Pressure	**-0.15**	**in. H20**		
Ps	Stack Pressure, Absolute	29.64	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	**1.381**	**in. H20**		
Tm	Dry Gas Meter Temperature, Average	71.6	deg. F	**531.6**	**deg. R**
Vm(std)	Sample Gas Volume	**35.5340**	**dscf**		
Vm(wet)	Sample Gas Volume, Wet	35.9713	scf		
Vw(std)	Water Vapor Volume	0.4373	scf		
Bws	Water Content of Stack Gas	**0.012**		**1.216**	**%**
CO2	Carbon Dioxide, Dry	**0.1**	**%**		
O2	Oxygen, Dry	**20.9**	**%**		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	**28.844**	**lb/lb mole**		
Ms	Molecular Wt. of Stack Gas, Wet	**28.712**	**lb/lb mole**		
Cp	Pitot Calibration Factor	**0.833**			
Del. P	Velocity Head, Average Square Root	**0.449**	**in. H20**		
Ts	Stack Gas Temperature, Average	**112.3**	deg. F	**572.3**	**deg. R**
As	Area of Stack	**3.69**	**sq ft**	26.0	in. dia.
Vs	Stack Gas Velocity	26.23	ft/sec		
Qa	Actual Flow Rate	5,802	cfm		
Qad	Actual Flow Rate, Dry	5,732	dcfm		
Q(std)	Stack Gas Flow Rate	**5,159**	**dscfm**		
An	Nozzle Area	**0.0004276**	**sq ft**	0.280	in. dia.
Theta	Sampling Time	**60**	**min.**		
I	Isokinetics	**98.98**	**%**		

Client: **Elbow Gin**
Site: **Visalia**
Unit: **#1 Dryer**

Date: **11/7/94**
Type: ***T std = 60 F***
Run: **2**

FIELD DATA & CALCULATIONS SUMMARY

Wlc	Water Condensate Weight	0.0	g		
Vlc	Water Condensate Volume	**0.0**	**ml**		
Vm	Metered Sample Gas Volume	**37.920**	**dcf**		
Lp	Avg. Leak Rate	0.004	cf		
Vn	Leak Corrected Sample Gas Volume	37.920	dcf		
Y	Dry Gas Meter Calibration Factor	**0.972**			
Pbar	Barometric Pressure	**29.65**	**in. Hg**		
Pg	Static Pressure	**-0.15**	**in. H20**		
Ps	Stack Pressure, Absolute	29.64	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	**1.321**	**in. H20**		
Tm	Dry Gas Meter Temperature, Average	79.8	deg. F	**539.8**	**deg. R**
Vm(std)	Sample Gas Volume	**35.3126**	**dscf**		
Vm(wet)	Sample Gas Volume, Wet	35.3126	scf		
Vw(std)	Water Vapor Volume	0.0000	scf		
Bws	Water Content of Stack Gas	**0.000**		**0.000**	**%**
CO2	Carbon Dioxide, Dry	**0.1**	**%**		
O2	Oxygen, Dry	**20.9**	**%**		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	**28.844**	**lb/lb mole**		
Ms	Molecular Wt. of Stack Gas, Wet	**28.844**	**lb/lb mole**		
Cp	Pitot Calibration Factor	**0.833**			
Del. P	Velocity Head, Average Square Root	**0.444**	**in. H20**		
Ts	Stack Gas Temperature, Average	**114.3**	deg. F	**574.3**	**deg. R**
As	Area of Stack	**3.69**	**sq ft**	26.0	in. dia.
Vs	Stack Gas Velocity	25.90	ft/sec		
Qa	Actual Flow Rate	5,730	cfm		
Qad	Actual Flow Rate, Dry	5,730	dcfm		
Q(std)	Stack Gas Flow Rate	**5,140**	**dscfm**		
An	Nozzle Area	**0.0004276**	**sq ft**	0.280	in. dia.
Theta	Sampling Time	**60**	**min.**		
I	Isokinetics	**98.74**	**%**		

Client: **Elbow Gin**
Site: **Visalia**
Unit: **#1 Dryer**

Date: **11/7/94**
Type: ***T std = 60 F***
Run: **3**

FIELD DATA & CALCULATIONS SUMMARY

Wlc	Water Condensate Weight	0.0	g		
Vlc	Water Condensate Volume	**0.0**	**ml**		
Vm	Metered Sample Gas Volume	**42.917**	**dcf**		
Lp	Avg. Leak Rate	0.007	cf		
Vn	Leak Corrected Sample Gas Volume	42.917	dcf		
Y	Dry Gas Meter Calibration Factor	**0.972**			
Pbar	Barometric Pressure	**29.65**	**in. Hg**		
Pg	Static Pressure	**-0.15**	**in. H20**		
Ps	Stack Pressure, Absolute	29.64	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	**1.585**	**in. H20**		
Tm	Dry Gas Meter Temperature, Average	80.7	deg. F	**540.7**	**deg. R**
Vm(std)	Sample Gas Volume	**39.9273**	**dscf**		
Vm(wet)	Sample Gas Volume, Wet	39.9273	scf		
Vw(std)	Water Vapor Volume	0.0000	scf		
Bws	Water Content of Stack Gas	**0.000**		**0.000**	**%**
CO2	Carbon Dioxide, Dry	**0.1**	**%**		
O2	Oxygen, Dry	**20.9**	**%**		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	**28.844**	**lb/lb mole**		
Ms	Molecular Wt. of Stack Gas, Wet	**28.844**	**lb/lb mole**		
Cp	Pitot Calibration Factor	**0.833**			
Del. P	Velocity Head, Average Square Root	**0.481**	**in. H20**		
Ts	Stack Gas Temperature, Average	**120.7**	deg. F	**580.7**	**deg. R**
As	Area of Stack	**3.69**	**sq ft**	26.0	in. dia.
Vs	Stack Gas Velocity	28.24	ft/sec		
Qa	Actual Flow Rate	6,247	cfm		
Qad	Actual Flow Rate, Dry	6,247	dcfm		
Q(std)	Stack Gas Flow Rate	**5,541**	**dscfm**		
An	Nozzle Area	**0.0004276**	**sq ft**	0.280	in. dia.
Theta	Sampling Time	**60**	**min.**		
I	Isokinetics	**103.54**	**%**		

FIELD DATA SUMMARY
TOTAL PARTICULATE
LINT CLEANER CYCLONE

M5

	Run#1	Run#2	Run#3
Vlc - Volume of water collected, ml	6.5	6.4	0.9
Vm - Gas volume, meter cond., dcf	31.571	32.444	32.031
Y - Meter calibration factor	1.028	1.028	1.028
Pbar - Barometric pressure, in. Hg	29.72	29.72	29.72
Pg - Stack static pressure, in. H20	-0.05	-0.05	-0.05
ΔH - Avg. meter press. diff., in. H20	1.434	1.488	1.499
Tm - Absolute meter temperature, °R	536.9	545.4	548.2
Vm(std) - Standard sample gas vol., dscf	31.3361	31.7075	31.1452
Bws - Water vapor part in gas stream	1.0 %	0.9 %	0.1 %
CO2 - Dry concentration, volume %	0.1	0.1	0.1
O2 - Dry concentration, volume %	20.9	20.9	20.9
Md - Mol wt. stack gas, dry, g/gmole	28.844	28.844	28.844
Ms - Mol wt. stack gas, wet, g/gmole	28.740	28.743	28.829
Cp - Pitot tube coef., dimensionless	0.833	0.833	0.833
Δp - Avg. of sq. roots of each Δp	0.623	0.631	0.633
Ts - Absolute stack Temp. °R	531.8	541.1	542.6
A - Area of stack, square feet	4.91	4.91	4.91
Qstd - Volumetric flow rate, dscfm	9913	9960	10041
An - Area of nozzel, square feet	0.0002737	0.0002737	0.0002737
ø - Sampling time, minutes	60	60	60
I - Isokinetic variation, percent	94.5	95.2	92.7

FIELD DATA SUMMARY
PM10 PARTICULATE
LINT CLEANER CYCLONE
M 501

	Run#1	Run#2	Run#3
Vlc - Volume of water collected, ml	--6.5	-- 6.4	-- 0.1
Vm - Gas volume, meter cond., dcf	35.123	35.521	34.628
Y - Meter calibration factor	0.972	0.972	0.972
Pbar - Barometric pressure, in. Hg	29.72	29.72	29.72
Pg - Stack static pressure, in. H20	-0.05	-0.05	-0.05
ΔH - Avg. meter press. diff., in. H20	1.000	1.000	1.000
Tm - Absolute meter temperature, °R	527.5	563.4	535.4
Vm(std) - Standard sample gas vol., dscf	33.5249	31.7433	32.5611
Bws - Water vapor part in gas stream	1.0 ?	0.9 ?	0.1 ?
CO2 - Dry concentration, volume %	0.1	0.1	0.1
O2 - Dry concentration, volume %	20.9	20.9	20.9
Md - Mol wt. stack gas, dry, g/gmole	28.844	28.844	28.844
Ms - Mol wt. stack gas. wet, g/gmole	28.740	28.743	28.829
Cp - Pitot tube coef., dimensionless	0.833	0.833	0.833
Δp - Avg. of sq. roots of each Δp	0.586	0.620	0.631
Ts - Absolute stack Temp. °R	531.8	541.1	544.1
A - Area of stack, square feet	4.91	4.91	4.91
Qstd - Volumetric flow rate, dscfm	9332	9782	9997
An - Area of nozzel, square feet	0.0002592	0.0025920	0.0002592
ø - Sampling time, minutes	60	60	60
I - Isokinetic variation, percent	113.4	102.4	102.8

Client: **Elbow Gin**
Site: **Visalia**
Unit: **Lint Cleaner**

Date: **11/8/94**
Type: ***T std = 60 F***
Run: **1**

FIELD DATA & CALCULATIONS SUMMARY

Wlc	Water Condensate Weight	6.5	g		
Vlc	Water Condensate Volume	**6.5**	**ml**		
Vm	Metered Sample Gas Volume	**31.571**	**dcf**		
Lp	Avg. Leak Rate	0.004	cf		
Vn	Leak Corrected Sample Gas Volume	31.571	dcf		
Y	Dry Gas Meter Calibration Factor	**1.028**			
Pbar	Barometric Pressure	**29.72**	**in. Hg**		
Pg	Static Pressure	**-0.05**	**in. H20**		
Ps	Stack Pressure, Absolute	29.72	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	**1.434**	**in. H20**		
Tm	Dry Gas Meter Temperature, Average	76.9	deg. F	**536.9**	**deg. R**
Vm(std)	Sample Gas Volume	**31.3361**	**dscf**		
Vm(wet)	Sample Gas Volume, Wet	31.6385	scf		
Vw(std)	Water Vapor Volume	0.3024	scf		
Bws	Water Content of Stack Gas	**0.010**		**0.956**	**%**
CO2	Carbon Dioxide, Dry	**0.1**	**%**		
O2	Oxygen, Dry	**20.9**	**%**		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	**28.844**	**lb/lb mole**		
Ms	Molecular Wt. of Stack Gas, Wet	**28.740**	**lb/lb mole**		
Cp	Pitot Calibration Factor	**0.833**			
Del. P	Velocity Head, Average Square Root	**0.623**	**in. H20**		
Ts	Stack Gas Temperature, Average	**71.8**	deg. F	**531.8**	**deg. R**
As	Area of Stack	**4.91**	**sq ft**	30.0	in. dia.
Vs	Stack Gas Velocity	34.99	ft/sec		
Qa	Actual Flow Rate	10,305	cfm		
Qad	Actual Flow Rate, Dry	10,207	dcfm		
Q(std)	Stack Gas Flow Rate	**9,913**	**dscfm**		
An	Nozzle Area	**0.0002737**	**sq ft**	0.224	in. dia.
Thela	Sampling Time	**60**	**min.**		
I	Isokinetics	**94.50**	**%**		

Client: **Elbow Gin**
Site: **Visalia**
Unit: **Lint Cleaner**

Date: **11/8/94**
Type: ***T std = 60 F***
Run: **2**

FIELD DATA & CALCULATIONS SUMMARY

Wlc	Water Condensate Weight	6.4	g		
Vlc	Water Condensate, Volume	**6.4**	**ml**		
Vm	Metered Sample Gas Volume	**32.444**	**dcf**		
Lp	Avg. Leak Rate	0.006	cf		
Vn	Leak Corrected Sample Gas Volume	32.444	dcf		
Y	Dry Gas Meter Calibration Factor	**1.028**			
Pbar	Barometric Pressure	**29.72**	**in. Hg**		
Pg	Static Pressure	**-0.05**	**in. H20**		
Ps	Stack Pressure, Absolute	29.72	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	**1.488**	**in. H20**		
Tm	Dry Gas Meter Temperature, Average	85.4	deg. F	**545.4**	**deg. R**
Vm(std)	Sample Gas Volume	**31.7075**	**dscf**		
Vm(wet)	Sample Gas Volume, Wet	32.0052	scf		
Vw(std)	Water Vapor Volume	0.2977	scf		
Bws	Water Content of Stack Gas	**0.009**		**0.930**	**%**
CO2	Carbon Dioxide, Dry	**0.1**	**%**		
O2	Oxygen, Dry	**20.9**	**%**		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	**28.844**	**lb/lb mole**		
Ms	Molecular Wt. of Stack Gas, Wet	**28.743**	**lb/lb mole**		
Cp	Pitot Calibration Factor	**0.833**			
Del. P	Velocity Head, Average Square Root	**0.631**	**in. H20**		
Ts	Stack Gas Temperature, Average	**81.1**	deg. F	**541.1**	**deg. R**
As	Area of Stack	**4.91**	**sq ft**	30.0	in. dia.
Vs	Stack Gas Velocity	35.76	ft/sec		
Qa	Actual Flow Rate	10,533	cfm		
Qad	Actual Flow Rate, Dry	10,435	dcfm		
Q(std)	Stack Gas Flow Rate	**9,960**	**dscfm**		
An	Nozzle Area	**0.0002737**	**sq ft**	0.224	in. dia.
Theta	Sampling Time	**60**	**min.**		
I	Isokinetics	**95.17**	**%**		

Client: **Elbow Gin**
Site: **Visalia**
Unit: **Lint Cleaner**

Date: **11/8/94**
Type: ***T std = 60 F***
Run: **3**

FIELD DATA & CALCULATIONS SUMMARY

Wlc	Water Condensate Weight	0.9	g		
Vlc	Water Condensate Volume	**0.9**	**ml**		
Vm	Metered Sample Gas Volume	**32.031**	**dcf**		
Lp	Avg. Leak Rate	0.017	cf		
Vn	Leak Corrected Sample Gas Volume	32.031	dcf		
Y	Dry Gas Meter Calibration Factor	**1.028**			
Pbar	Barometric Pressure	**29.72**	**in. Hg**		
Pg	Static Pressure	**-0.05**	**in. H20**		
Ps	Stack Pressure, Absolute	29.72	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	**1.499**	**in. H20**		
Tm	Dry Gas Meter Temperature, Average	88.2	deg. F	**548.2**	**deg. R**
Vm(std)	Sample Gas Volume	**31.1452**	**dscf**		
Vm(wet)	Sample Gas Volume, Wet	31.1871	scf		
Vw(std)	Water Vapor Volume	0.0419	scf		
Bws	Water Content of Stack Gas	**0.001**		**0.134**	**%**
CO2	Carbon Dioxide, Dry	**0.1**	**%**		
O2	Oxygen, Dry	**20.9**	**%**		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	**28.844**	**lb/lb mole**		
Ms	Molecular Wt. of Stack Gas, Wet	**28.829**	**lb/lb mole**		
Cp	Pitot Calibration Factor	**0.833**			
Del. P	Velocity Head, Average Square Root	**0.633**	**in. H20**		
Ts	Stack Gas Temperature, Average	**82.6**	deg. F	**542.6**	**deg. R**
As	Area of Stack	**4.91**	**sq ft**	30.0	in. dia.
Vs	Stack Gas Velocity	35.87	ft/sec		
Qa	Actual Flow Rate	10,564	cfm		
Qad	Actual Flow Rate, Dry	10,549	dcfm		
Q(std)	Stack Gas Flow Rate	**10,041**	**dscfm**		
An	Nozzle Area	**0.0002737**	**sq ft**	0.224	in. dia.
Theta	Sampling Time	**60**	**min.**		
I	Isokinetics	**92.72**	**%**		

Client: **Elbow**
Site: **Visalia**
Unit: **Lint**

Date: **11/7/94**
Type: ***T std = 60 F***
Run: **Run #1 PM-10**

FIELD DATA & CALCULATIONS SUMMARY

Vm	Metered Sample Gas Volume	**35.123**	**dcf**		
Lp	Avg. Leak Rate	0.000	cf		
Vn	Leak Corrected Sample Gas Volume	35.123	dcf		
Y	Dry Gas Meter Calibration Factor	**0.972**			
Pbar	Barometric Pressure	**29.72**	**in. Hg**		
Pg	Static Pressure	**-0.05**	**in. H20**		
Ps	Stack Pressure, Absolute	29.72	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	**1.000**	**in. H20**		
Tm	Dry Gas Meter Temperature, Average	67.5	deg. F	**527.5**	**deg. R**
Vm(std)	Sample Gas Volume	**33.5249**	**dscf**		
Vm(wet)	Sample Gas Volume, Wet	33.8485	scf		
Bws	Water Content of Stack Gas	**0.010**		**0.956**	**%**
CO2	Carbon Dioxide, Dry	**0.1**	**%**		
O2	Oxygen, Dry	**20.9**	**%**		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	**28.844**	**lb/lb mole**		
Ms	Molecular Wt. of Stack Gas, Wet	**28.740**	**lb/lb mole**		
Cp	Pitot Calibration Factor	**0.833**			
Del. P	Velocity Head, Average Square Root	**0.586**	**in. H20**		
Ts	Stack Gas Temperature, Average	**71.8**	deg. F	**531.8**	**deg. R**
As	Area of Stack	**4.91**	**sq ft**	30.0	in. dia.
Vs	Stack Gas Velocity	32.94	ft/sec		
Qa	Actual Flow Rate	9,701	cfm		
Qad	Actual Flow Rate, Dry	9,608	dcfm		
Q(std)	Stack Gas Flow Rate	**9.332**	**dscfm**		
An	Nozzle Area	**0.0002592**	**sq ft**	0.218	in. dia.
Theta	Sampling Time	**60**	**min.**		
I	Isokinetics	**113.39**	**%**		

Client: **Elbow**
Site: **Visalia**
Unit: **Lint**

Date: **11/7/94**
Type: ***T std = 60 F***
Run: **Run #2 PM-10**

FIELD DATA & CALCULATIONS SUMMARY

Vm	Metered Sample Gas Volume	**35.521**	**dcf**		
Lp	Avg. Leak Rate	0.000	cf		
Vn	Leak Corrected Sample Gas Volume	35.521	dcf		
Y	Dry Gas Meter Calibration Factor	**0.972**			
Pbar	Barometric Pressure	**29.72**	**in. Hg**		
Pg	Static Pressure	**-0.05**	**in. H20**		
Ps	Stack Pressure, Absolute	29.72	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	**1.000**	**in. H20**		
Tm	Dry Gas Meter Temperature, Average	103.4	deg. F	**563.4**	**deg. R**
Vm(std)	Sample Gas Volume	**31.7433**	**dscf**		
Vm(wet)	Sample Gas Volume, Wet	32.0412	scf		
Bws	Water Content of Stack Gas	**0.009**		**0.930**	**%**
CO2	Carbon Dioxide, Dry	**0.1**	**%**		
O2	Oxygen, Dry	**20.9**	**%**		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	**28.844**	**lb/lb mole**		
Ms	Molecular Wt. of Stack Gas, Wet	**28.743**	**lb/lb mole**		
Cp	Pitot Calibration Factor	**0.833**			
Del. P	Velocity Head, Average Square Root	**0.620**	**in. H20**		
Ts	Stack Gas Temperature, Average	**81.1**	deg. F	**541.1**	**deg. R**
As	Area of Stack	**4.91**	**sq ft**	30.0	in. dia.
Vs	Stack Gas Velocity	35.12	ft/sec		
Qa	Actual Flow Rate	10,344	cfm		
Qad	Actual Flow Rate, Dry	10,248	dcfm		
Q(std)	Stack Gas Flow Rate	**9.782**	**dscfm**		
An	Nozzle Area	**0.0002592**	**sq ft**	0.218	in. dia.
Thela	Sampling Time	**60**	**min.**		
I	Isokinetics	**102.43**	**%**		

Client: **Elbow**
Site: **Visalia**
Unit: **Lint**

Date: **11/7/94**
Type: ***T std = 60 F***
Run: **Run #3 PM-10**

FIELD DATA & CALCULATIONS SUMMARY

Vm	Metered Sample Gas Volume	**34.628**	**dcf**		
Lp	Avg. Leak Rate	0.013	cf		
Vn	Leak Corrected Sample Gas Volume	34.628	dcf		
Y	Dry Gas Meter Calibration Factor	**0.972**			
Pbar	Barometric Pressure	**29.72**	**in. Hg**		
Pg	Static Pressure	**-0.05**	**in. H2O**		
Ps	Stack Pressure, Absolute	29.72	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	**1.000**	**in. H2O**		
Tm	Dry Gas Meter Temperature, Average	75.4	deg. F	**535.4**	**deg. R**
Vm(std)	Sample Gas Volume	**32.5611**	**dscf**		
Vm(wet)	Sample Gas Volume, Wet	32.6048	scf		
Bws	Water Content of Stack Gas	**0.001**		**0.134**	**%**
CO2	Carbon Dioxide, Dry	**0.1**	**%**		
O2	Oxygen, Dry	**20.9**	**%**		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	**28.844**	**lb/lb mole**		
Ms	Molecular Wt. of Stack Gas, Wet	**28.829**	**lb/lb mole**		
Cp	Pitot Calibration Factor	**0.833**			
Del. P	Velocity Head, Average Square Root	**0.631**	**in. H20**		
Ts	Stack Gas Temperature, Average	**84.1**	deg. F	**544.1**	**deg. R**
As	Area of Stack	**4.91**	**sq ft**	30.0	in. dia.
Vs	Stack Gas Velocity	35.81	ft/sec		
Qa	Actual Flow Rate	10,546	cfm		
Qad	Actual Flow Rate, Dry	10,532	dcfm		
Q(std)	Stack Gas Flow Rate	**9,997**	**dscfm**		
An	Nozzle Area	**0.0002592**	**sq ft**	0.218	in. dia.
Theta	Sampling Time	**60**	**min.**		
I	Isokinetics	**102.80**	**%**		

AIRx Testing - 1994

Client: Elbow Gln
Site: Visalia
Unit: #1 Dryer

Date: 11/7/94
Type: *T std = 60 F*
Run: 1

CALCULATED EMISSION RESULTS

Particulate Weight	0.2057	g
Particulate Emissions	0.0893	grain/dscf
Particulate Flow Rate	3.95	lb/hr
Particulate Flow Rate	0.10	lb/bale
+10μ Particulate	69.8	%
+10μ Particulate	2.76	lb/hr
+10μ Particulate	0.07	lb/bale
-10μ Particulate	30.2	%
-10μ Particulate	1.19	lb/hr
-10μ Particulate	0.03	lb/bale

AIRx Testing -1994

Client: **Elbow Gin**
Site: **Visalia**
Unit: **#1 Dryer**

Date: **11/7/94**
Type: ***T std = 60 F***
Run: **2**

CALCULATED EMISSION RESULTS

Particulate Weight	0.1869	g
Particulate Emissions	0.0817	grain/dscf
Particulate Flow Rate	3.60	lb/hr
Particulate Flow Rate	0.09	lb/bale
+10µ Particulate	79.9	%
+10µ Particulate	2.87	lb/hr
+10µ Particulate	0.07	lb/bale
-10µ Particulate	20.1	%
-10µ Particulate	0.72	lb/hr
-10µ Particulate	0.02	lb/bale

AIRx Testing -1994

Client: **Elbow Gin**
Site: **Visalia**
Unit: **#1 Dryer**

Date: **11/7/94**
Type: ***T std = 60 F***
Run: **3**

CALCULATED EMISSION RESULTS

Particulate Weight	0.1864	g
Particulate Emissions	0.0720	grain/dscf
Particulate Flow Rate	3.42	lb/hr
Particulate Flow Rate	0.11	lb/bale
+10µ Particulate	62.1	%
+10µ Particulate	2.12	lb/hr
+10µ Particulate	0.07	lb/bale
-10µ Particulate	37.9	%
-10µ Particulate	1.30	lb/hr
-10µ Particulate	0.04	lb/bale

AIRx Testing -1994

Client: Elbow Gin
Site: Visalia
Unit: Lint Cleaner

Date: 11/8/94
Type: *T std = 60 F*
Run: 1

CALCULATED EMISSION RESULTS

Particulate Weight	0.0315	g
Particulate Emissions	0.0155	grain/dscf
Particulate Flow Rate	1.32	lb/hr
Particulate Flow Rate	0.03	lb/bale
+10µ Particulate	71.6	%
+10µ Particulate	0.94	lb/hr
+10µ Particulate	0.02	lb/bale
-10µ Particulate	28.4	%
-10µ Particulate	0.37	lb/hr
-10µ Particulate	0.01	lb/bale

AIRx Testing -1994

Client: **Elbow Gin**
Site: **Visalia**
Unit: **Lint Cleaner**

Date: **11/8/94**
Type: ***T std = 60 F***
Run: **2**

CALCULATED EMISSION RESULTS

Particulate Weight	0.0353	g
Particulate Emissions	0.0172	grain/dscf
Particulate Flow Rate	1.47	lb/hr
Particulate Flow Rate	0.04	lb/bale
+10μ Particulate	73.1	%
+10μ Particulate	1.07	lb/hr
+10μ Particulate	0.03	lb/bale
-10μ Particulate	26.9	%
-10μ Particulate	0.39	lb/hr
-10μ Particulate	0.01	lb/bale

AIRx Testing -1994

Client: **Elbow Gin**
Site: **Visalia**
Unit: **Lint Cleaner**

Date: **11/8/94**
Type: ***T std = 60 F***
Run: **3**

CALCULATED EMISSION RESULTS

Particulate Weight	0.0293	g
Particulate Emissions	0.0145	grain/dscf
Particulate Flow Rate	1.25	lb/hr
Particulate Flow Rate	0.03	lb/bale
+10µ Particulate	72.3	%
+10µ Particulate	0.90	lb/hr
+10µ Particulate	0.02	lb/bale
-10µ Particulate	27.7	%
-10µ Particulate	0.35	lb/hr
-10µ Particulate	0.01	lb/bale

AIRx Testing -1994