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Clean Air Engineering

Note: This is a reference cited in AP 42, *Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources*. AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

REPORT ON
COMPLIANCE TESTING

Performed for:
COORS BREWING COMPANY
GOLDEN, COLORADO

CAE Project No: 6362-1
November 25, 1992

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SUMMARY

INTRODUCTION

Clean Air Engineering was contracted by Coors Brewing Company to determine the particulate removal efficiency and the level of total hydrocarbons emissions at their facility located in Golden, Colorado for compliance purposes.

The testing took place at the Spent Grain Dryer No. 9 Inlet and Outlet on August 22 and 23, 1992. Coordinating the field testing were:

G. Zimmerman - Coors Brewing Company
M. Hynes - Clean Air Engineering

SUMMARY OF TEST RESULTS

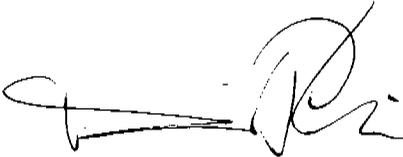
The test conditions and results of analysis are presented in Table 1 on page 1-2.

To the best of our knowledge, the data presented in this report are accurate and complete.

Respectfully submitted,

CLEAN AIR ENGINEERING


Michael Pierce
Manager, Denver Region


David Perkins
Manager, Technical Communications



SUMMARY OF PROCEDURES

SAMPLING PROCEDURES

The sampling followed procedures as detailed in U.S. Environmental Protection Agency (EPA) Methods 1, 2, 3, 4, 5 and 25A. These methods are titled:

- Method 1 — "Sample and Velocity Traverses for Stationary Sources;"
- Method 2 — "Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube);"
- Method 3 — "Gas Analysis for the Determination of Dry Molecular Weight;"
- Method 4 — "Determination of Moisture Content in Stack Gases;"
- Method 5 — "Determination of Particulate Emissions from Stationary Sources;"
- Method 25A - "Determination of Total Gaseous Organic Concentrations using a Flame Ionization Analyzer (FIA)."

These methods appear in detail in Title 40 of the Code of Federal Regulations (CFR), Part 60, Appendix A.

The sampling apparatus are shown in Figures 1 and 2 on pages 3-2 and 3-3. All equipment was calibrated at the Clean Air Engineering laboratory prior to shipment to the job site.

Sampling Locations

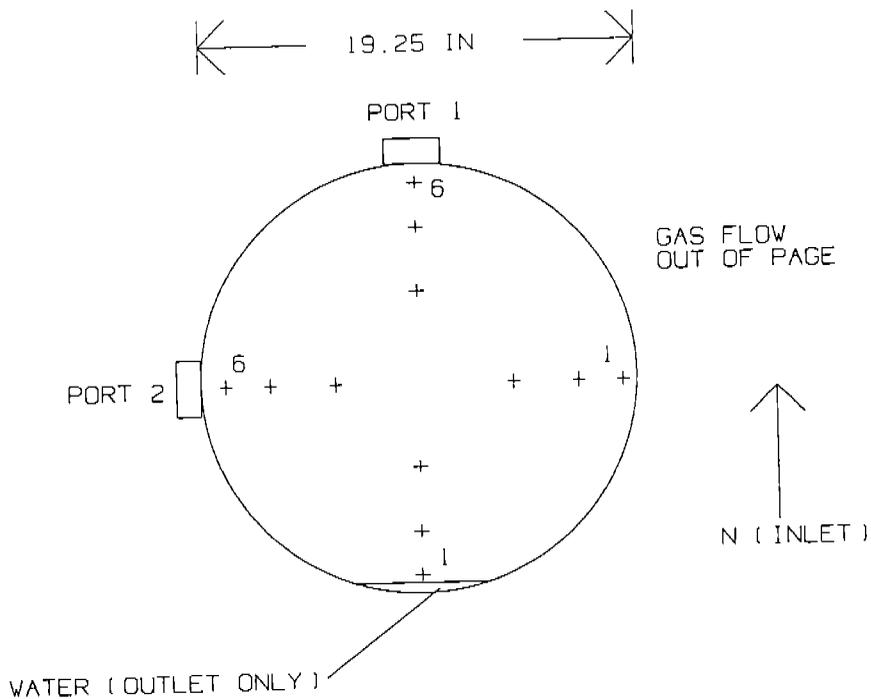
The Spent Grain Dryer No. 9 Inlet has two ports. For particulate testing, six points were sampled per port. For Run 1, the sampling time per point was five minutes for a total sampling time of 60 minutes. For Runs 3 and 4, the sampling time per point was six minutes for a total sampling time of 72 minutes.

The Spent Grain Dryer No. 9 Outlet has two ports. For particulate testing, six points were sampled per port. For Run 1, the sampling time per point was eight minutes for a total sampling time of 96 minutes. For Runs 3 and 4, the sampling time per point was seven minutes for a total sampling time of 84 minutes. For total hydrocarbon testing, a single point was sampled in the center of the duct for approximately 60 minutes. The sampling locations are shown in Figure 3 on page 3-4.



Figure 3

The cross section of the Spent Grain Dryer No. 9 Inlet and Outlet shows sampling point locations.



<u>TRAVERSE POINT</u>	<u>PORT TO POINT DISTANCE (IN)</u>
1	18.4
2	16.4
3	13.6
4	5.7
5	2.8
6	0.8

COORS BREWING COMPANY
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 Figure 3
 Spent Grain Dryer No. 9 Inlet and Outlet
 Sampling Point Locations

COMMENTS

The measured gas stream moisture content for Run 1 at the Spent Grain Dryer No. 9 Outlet was above the saturation limit. A comparison of the moisture values calculated using the actual data and the saturated data follows. The saturated moisture values were used to perform all calculations.

<u>Location</u>	<u>Saturated Moisture (%H₂O Vapor, volume basis)</u>	<u>Measured Value (%H₂O Vapor, volume basis)</u>	<u>Percent Difference</u>
Spent Grain Dryer Outlet Run No.1	33.5	40.9	18.1

Free moisture droplets in the gas stream account for moisture measurements which are over the gas saturation limit. Substitution of saturated moisture content is recommended in the EPA guidelines documented in "Quality Assurance Manuals for Air Pollution Measurement Systems," Vol 3, "Stationary Source Specific Methods" (EPA-600/4-77-027b), Section 3.3.6.5.

Run 2 was not included in the results because the unit was not operating.

No other deviations from standard U.S. EPA testing procedures were noted.

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CAE Project No: 6362-1
Date: 11/14/80
Page: 4-1
Title: Spent Grain Dryer No. 9 Outlet
Author: J. J. [unclear]
Reviewed: [unclear]
Approved: [unclear]

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APPENDIX

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NOMENCLATURE

5-1

Nomenclature

A	-	absorbance
A_n	-	cross sectional area of nozzle (ft ²)
A_s	-	cross sectional area of stack (ft ²)
B_{wo}	-	proportion of water vapor in the gas stream by volume
B_{ws}	-	proportion of water vapor in the gas stream by volume at saturated conditions
C_p	-	pitot tube coefficient (dimensionless)
D_f	-	dilution factor
F_d	-	ratio of dry gas generated to gross calories (dscf/MBtu)
F_c	-	ratio of gas generated
GCV	-	gross calorific value of fuel (Btu/lb)
$\frac{DH}{\sqrt{DP}}$	-	average pressure drop across meter box orifice (in. H ₂ O)
\sqrt{DP}	-	average square roots of velocity heads of stack gas ($\sqrt{\text{in. H}_2\text{O}}$)
DH@	-	meter orifice calibration coefficient (in. H ₂ O)
%I	-	percent of isokinetic sampling (acceptable: $90 \leq \%I \leq 110\%$)
K_p	-	pitot tube constant: $85.49 \text{ (ft/sec)} \frac{\sqrt{(\text{lb/lb-mole})(\text{in. Hg})}}{\sqrt{(\text{ }^\circ \text{R})(\text{in. H}_2\text{O})}}$
K_c	-	spectrophotometer calibration factor
M_d	-	dry molecular weight of stack gas (lb/lb-mole)
M_s	-	molecular weight of stack gas, wet basis (lb/lb-mole)
M_n	-	total amount of particulate matter collected (gm)
N	-	normality of titrant (meq/ml)
P_b	-	barometric pressure (in. Hg)
P_f	-	final absolute pressure of flask (in. Hg)
P_i	-	initial absolute pressure of flask (in. Hg)
P_s	-	absolute stack gas pressure (in. Hg)
Q_a	-	volumetric flow rate, actual conditions
Q_{std}	-	volumetric flow rate, standard conditions, dry basis
std	-	standard conditions, 29.92 in. Hg, 68 ° F
T_f	-	final absolute temperature of flask (° R)
T_i	-	initial temperature of flask (° R)
T_m	-	average dry gas meter temperature (° F)

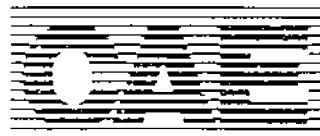


T_s	-	average stack temperature (° F)
T_{std}	-	absolute temperature, standard conditions (528 ° R)
Θ	-	total sampling time (min)
V_a	-	volume of aliquot (ml)
V_f	-	volume of flask (ml)
V_{lc}	-	total volume of liquid collected in impingers and silica gel (ml)
V_m	-	volume of gas sample through the dry gas meter at meter conditions (ft ³)
V_{mstd}	-	volume of gas sample through the dry gas meter, standard conditions (ft ³)
V_{sc}	-	volume of flask sample, standard conditions (ml)
V_{soln}	-	total volume of solution (ml)
V_t	-	volume of titrant used to titrate aliquot (ml)
V_{tb}	-	volume of titrant used to titrate blank (ml)
V_{wstd}	-	volume of water collected, standard conditions (ft ³)
V_s	-	stack gas velocity (ft/sec)
Y_d	-	gas meter correction factor (dimensionless)



Nomenclature

CAL GAS	actual concentration of the upscale calibration gas
CAL I	initial system calibration bias check response for the upscale calibration gas, ppm
CAL F	final system calibration bias check response for the upscale calibration gas, ppm
ZERO I	initial system calibration bias check response for the zero gas, ppm
ZERO F	final system calibration bias check response for the zero gas, ppm
ppm	measured concentration as parts per million in the gas stream
ppm (drift calibrated)	concentration calibrated for drift as per Eq. 6C-1 of EPA Method 6C



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SAMPLE CALCULATIONS

SAMPLE CALCULATIONS - Run 1, Spent Grain Dryer No. 9 Outlet
(Note: results are taken from computer analysis)

1. Volume of water collected

$$\begin{aligned} V_{wstd} &= (0.04707 \text{ ft}^3/\text{ml}) (V_{lc}) \\ &= (0.04707) (630.0) \\ &= 29.65 \text{ wscf} \end{aligned}$$

2. Volume of gas metered, standard conditions

$$\begin{aligned} V_{mstd} &= \frac{(17.64 \text{ }^\circ\text{R}/\text{in. Hg}) (V_m) \left[P_b + \frac{DH}{13.6} \right] (Y_d)}{(460 + T_m)} \\ &= \frac{(17.64) (55.23) \left[24.37 + \frac{0.89}{13.6} \right] (1.0078)}{(460 + 99)} \\ &= 42.91 \text{ dscf} \end{aligned}$$

3. Moisture content (measured)

$$\begin{aligned} B_{wo} &= \frac{V_{wstd}}{V_{mstd} + V_{wstd}} \\ &= \frac{29.65}{42.91 + 29.65} \\ &= 0.4086 \\ &= 40.9\% \end{aligned}$$

Saturated moisture value

$$B_{wo} = \frac{\text{saturated moisture value}}{\text{saturated vapor pressure}} = \frac{P_s}{P_s}$$

$$\begin{aligned} &= \frac{8.147}{24.35} \\ &= 0.3346 \\ &= 33.5\% \end{aligned}$$

If $B_{wo} \text{ (saturated)} < B_{wo} \text{ (measured)}$, then use $B_{wo} \text{ (saturated)}$

4. Molecular weight of dry gas stream

$$\begin{aligned} M_d &= 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%CO + \%N_2) \\ &= 0.44(0.0) + 0.32(20.9) + 0.28(79.1) \\ &= 28.84 \end{aligned}$$

5. Molecular weight of stack gas

$$\begin{aligned} M_s &= M_d (1 - B_{wo}) + 18(B_{wo}) \\ &= 28.84 (1 - 0.3346) + 18(0.3346) \\ &= 25.21 \end{aligned}$$

6. Stack pressure (in. Hg)

$$\begin{aligned} P_s &= P_b + \left(\frac{\text{STATIC P}}{13.6} \right) \\ &= 24.37 + \left(\frac{-0.3}{13.6} \right) \\ &= 24.35 \end{aligned}$$

SAMPLE CALCULATIONS (Continued)

7. Velocity of stack gas

$$\begin{aligned} V_s &= K_p C_p (DP)^{\frac{1}{2}} \frac{[\bar{T}_s + 460]^{\frac{1}{2}}}{[(M_s) (P_s)]^{\frac{1}{2}}} \\ &= 85.49 (0.84) (1.107) \frac{[153 + 460]^{\frac{1}{2}}}{[(25.21) (24.35)]^{\frac{1}{2}}} \\ &= 79.45 \text{ ft/sec} \end{aligned}$$

8. Total flow of stack gas

$$\begin{aligned} Q_a &= (60) (A_s) (V_s) \\ &= (60) (1.996) (79.45) \\ &= 9,515 \text{ acfm} \\ Q_{std} &= \frac{Q_a P_s (17.64 \text{ }^\circ\text{R/in. Hg}) (1 - B_{wo})}{\bar{T}_s + 460} \\ &= \frac{(9,515) (24.35) (17.64) (1 - 0.3346)}{153 + 460} \\ &= 4,434 \text{ dscfm} \end{aligned}$$

9. Percent Isokinetic

$$\begin{aligned} \%I &= \frac{(0.09450) (\bar{T}_s + 460) V_{mstd}}{P_s V_s A_n \Theta (1 - B_{wo})} \\ &= \frac{(0.09450) (153 + 460) (42.91)}{(24.35) (79.45) (0.000209) (96.0) (1 - 0.3346)} \\ &= 96.3 \% \end{aligned}$$

10. Particulate

$$\begin{aligned} \text{gr/dscf} &= \frac{(15.43 \text{ gr/g}) (M_n)}{V_{mstd}} \\ &= \frac{(15.43) (0.0272)}{42.91} \\ &= 0.0098 \\ \text{lb/hr} &= \frac{(\text{gr/dscf}) (Q_{std}) (60)}{7,000 \text{ gr/lb}} \\ &= \frac{(0.0098) (4,434) (60)}{7,000} \\ &= 0.37 \end{aligned}$$

SAMPLE CALCULATIONS (Continued)

12. Total Hydrocarbons (as propane)

$$\begin{aligned} \text{ppm}_{\text{wet, drift calibrated}} &= \frac{(C_{\text{avg}} - C_o) C_{\text{ma}}}{(C_m - C_o)} \\ &= (29 - 0) \frac{55.52}{(54.5 - 0)} \\ &= 30 \end{aligned}$$

- C_{avg} = Average gas concentration indicated by gas analyzer, wet basis, ppm.
- C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm.
- C_m = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm.
- C_{ma} = Actual concentration of the upscale calibration gas, ppm.

$$\begin{aligned} \text{ppm}_{\text{dry}} &= \frac{\text{ppm}_{\text{wet, drift calibrated}}}{1 - B_{\text{wo}}} \\ &= \frac{30}{1 - 0.3346} \\ &= 44 \end{aligned}$$

$$\begin{aligned} \text{lb/hr}_{\text{propane}} &= \left(\frac{(\text{ppm}_{\text{dry}}) (\text{MW})}{385.3 \times 10^6 \text{ ft}^3 / \text{lb mole}} \right) (\text{dscfm}) (60) \\ &= \left(\frac{(44) (44)}{385.3 \times 10^6} \right) (4,434) (60) \\ &= 1.35 \end{aligned}$$

$$\begin{aligned} \text{lb/dscf} &= \frac{(\text{ppm}_{\text{dry}}) (\text{MW})}{385.3 \times 10^6} \\ &= \frac{(44)(44)}{385.3 \times 10^6} \\ &= 5.07 \times 10^{-6} \end{aligned}$$

$$\begin{aligned} \text{ton/yr} &= \frac{(\text{lb/hr}) (24 \frac{\text{hr}}{\text{day}}) (365 \frac{\text{days}}{\text{yr}})}{2,000 \frac{\text{lb}}{\text{ton}}} \\ &= \frac{(1.35)(24)(365)}{2,000} \\ &= 5.91 \end{aligned}$$

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PARAMETERS

5-3

COORS BREWING COMPANY
 CAE Project No: 6362-1
 Spent Grain Dryer No. 9 Inlet

Moisture and Velocity Parameters

Run No.*	1	3	4
Date (1992)	August 22	August 23	August 23
Start Time (approx.)	12:10 PM	10:00 AM	12:10 PM
Stop Time (approx.)	1:15 PM	11:22 AM	1:27 PM
%CO2	0.0	0.0	0.0
%O2	21.0	21.0	20.9
Pb	24.37	24.37	24.37
STATIC P	-4.4	-3.6	-3.6
Cp	0.84	0.84	0.84
An	0.000190	0.000190	0.000190
As	2.02	2.02	2.02
Vlc	328.3	372.8	392.6
Vm	34.48	35.74	35.06
DH	0.75	0.56	0.52
DH@	1.636	1.636	1.636
Yd	0.9946	0.9946	0.9946
Tm	101	97	100
Mn	0.3521	0.1378	0.4480
θ	60.0	72.0	72.0

CALCULATED RESULTS

Vwstd	15.45	17.55	18.48
Vmstd	26.34	27.48	26.81
Bwo	0.3698	0.3897	0.4080
AVG VEL ROOT	1.135	1.125	1.151
AVG TEMP	165	166	163
% l	108.0	97.3	95.0
Md	28.84	28.84	28.84
Ms	24.83	24.62	24.41
Ps	24.05	24.11	24.11
Vs	83.35	82.99	85.03
Qa (acfm)	10,102	10,058	10,305
Qstd (dscfm)	4,323	4,170	4,167
gr/dscf	0.2063	0.0774	0.2578
lb/hr	7.64	2.77	9.21
ton/yr	33.48	12.11	40.33

* Run 2 was not included because the unit was not operating.

COORS BREWING COMPANY
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 Spent Grain Dryer No. 9 Outlet

Moisture and Velocity Parameters

Run No.*	1	3	4
Date (1992)	August 22	August 23	August 23
Start Time (approx.)	11:35 AM	9:55 AM	12:11 PM
Stop Time (approx.)	1:32 PM	11:23 AM	1:38 PM
%CO2	0.0	0.0	0.0
%O2	20.9	21.0	21.0
Pb	24.37	24.37	24.37
STATIC P	-0.3	-0.6	-0.6
Cp	0.84	0.84	0.84
An	0.000209	0.000209	0.000209
As**	1.996	1.996	1.996
Vlc	630.0	428.0	491.0
Vm	55.23	41.92	43.90
DH	0.83	0.63	0.66
DH@	1.6764	1.6764	1.6764
Yd	1.0078	1.0078	1.0078
Tm	99	94	100
Mn	0.0272	0.0147	0.0162
θ	96.0	84.0	84.0
Saturated Vapor Pressure	8.147	N/A	N/A

CALCULATED RESULTS

Vwstd	29.65	20.15	23.11
Vmstd	42.91	32.84	34.03
Bwo***	0.3346	0.3802	0.4045
AVG VEL ROOT	1.107	1.070	1.047
AVG TEMP	153	159	162
% I	96.3	93.1	102.3
Md	28.84	28.84	28.84
Ms	25.21	24.72	24.46
Ps	24.35	24.33	24.33
Vs	79.46	77.98	76.87
Qa (acfm)	9,516	9,339	9,206
Qstd (dscfm)	4,435	4,013	3,781
gr/dscf	0.0098	0.0069	0.0073
lb/hr	0.37	0.24	0.24
ton/yr	1.63	1.04	1.04

* Run 2 was not included because the unit was not operating.

** Area corrected for 0.75" water at bottom of duct.

*** Run 1 had saturated moistures. The saturation moisture value was used in all calculations

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Spent Grain Dryer No. 9 Outlet

Total Hydrocarbons Concentration
(ppm as propane)

Run No.	1	3	4
Date (1992)	August 22	August 23	August 23
Start Time (approx.)	11:03 AM	10:40 AM	12:24 PM
Stop Time (approx.)	12:06 PM	11:41 AM	1:28 PM
dscfm	4,434	4,013	3,781
Bwo	0.3346	0.3802	0.4045
ZERO I	0	0	0
CAL I	55	56	53
ZERO F	0	0	0
CAL F	54	53	53
ppm	29	47	42
CAL GAS	55.52	55.52	55.52
ppm, wet (drift calibrated)	30	48	44
ppm, dry	44	77	74
lb/dscf	5.07E-06	8.82E-06	8.44E-06
lb/hr	1.35	2.12	1.91
ton/yr	5.91	9.30	8.38

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CALIBRATION DATA

5-4

METER BOX FUTURE CARBON

Date: 03-27-82 Operator: S O Barometric Pressure: 24.71

Meter Box No.: 04 Meter Box ΔH@: 1.636 Meter Box Yd: 994.6

Q	ΔH	ΔP	Yds	Standard Meter Gas Volume ft ³		Meter Box Gas Volume ft ³		Std. Meter Temperature °F		Meter Box Temperature °F		Time	Yd	ΔH@		
				Initial	Final	Vds Net	Initial	Final	Vds Net	In	Out				In	Out
51	3.0	-13.0	1.000	0	10.004	10.004	292.564	302.724	9.540	70	70	92.5	85.5	9.05	1.0038	1.610
51	3.0	-13.0	1.000	0	10.004	10.004	307.511	317.775	5.568	70	70	93	86	9.05	1.0015	1.610
64	1.5	-7.2	1.000	0	10.001	10.001	317.779	327.953	10.174	70	70	95	86.5	12.91	.9952	1.635
64	1.5	-7.0	1.000	0	10.001	10.001	327.953	337.153	10.200	70	70	95	87	12.92	.9931	1.637
37	1.5	-3.6	1.000	0	5.000	5.000	287.761	292.884	5.175	70	70	92	85	11.23	.9977	1.657
36	1.5	-3.6	1.000	0	5.000	5.000	302.234	307.511	5.157	70	70	92	86	11.27	.9963	1.667

Calculations

$$Yd = (Yds) \left[\frac{Vds}{Vd} \right] \left[\frac{Td + 460}{Tds + 460} \right] \left[\frac{Pb + \Delta P / 13.6}{Pb + \Delta H / 13.6} \right]$$

$$\Delta H@ = \frac{0.0317 \Delta H}{Pb(Td + 460) - (Vds)(Yds)}$$

$$Q = \frac{17.64 (Vds)(Pb)}{(Tds + 460)90}$$

Nomenclature

Pb Barometric Pressure
 Q Flow Rate (cfm)
 ΔH Orifice Pressure Differential ("H₂O)
 ΔP Inlet Pressure Differential ("H₂O)
 Vd Volume Dry Gas Meter (ft³)
 Vds Volume Dry Standard (ft³)
 Yd Meter Correction Factor (unitless)
 Yds Standard Meter Correction Factor (unitless)
 ΔH@ Orifice Pressure Differential that gave 0.75 cfm of air at 70°F and 29.92 "Hg ("H₂O)

Vacuum Gauge Calibration

Standard (Hgr)	Vacuum Gauge
5	5
10.1	10
15	15
20.5	20
25.2	24

Thermometer Calibration

Standard	Inlet	Outlet
60	60	60
50	50	50
100	100	100
170	170	170

POST TEST CALIBRATION CHECK

METER BOX Yds: 1.0100

DATE: 9-9-92

JOB#: 6253
6317

CLIENT/OWNER: Coors

METER BOX NUMBER: d-4

METER BOX VACUUM: 0

Sp	Q	dh	dP	Pds	WET TEST VOLUME		METER Vds	DRY GAS VOLUME		METER Vds	WET TEST TEMPERATURES		DRY GAS TEMPERATURES		TIME	Yd	dHC
					INITIAL	FINAL		INITIAL	FINAL		IN	OUT	IN	OUT			
25.130	0.6044	1.50	-12.5	1.00	0.000	10.005	10.005	803.56000	813.220	9.660	82.0	82.0	94.0	89	13.54	1.0109	1.646
25.130	0.6048	1.50	-12.1	1.00	0.000	10.005	10.005	813.22000	822.910	9.696	82.0	72.0	95.0	89	13.53	1.0099	1.642
25.130	0.6047	1.50	-12.5	1.00	0.000	10.000	10.004	822.91000	832.610	9.700	82.0	72.0	95.0	91	13.53	1.0094	1.639

FILE: 6253

METER BOX FULL TEST CALIBRATION

Yd: 1.0078 dHR: 1.5764

Op	METER TEST VOLUME		METER DRY VOLUME		METER NET Wt		HET TEST TEMPERATURES		DRY GAS METER TEMPERATURES		TIME	Yd	dHR
	INITIAL	FINAL	INITIAL	FINAL	WT	IN	OUT	IN	OUT				
24.840	0.9017	3.00	10.000	323.54800	333.250	9.602	74.0	74.0	90.5	81	9.10	1.0142	1.657
24.840	0.8996	3.00	10.009	333.25000	342.889	9.639	74.0	74.0	92.0	82	9.13	1.0136	1.661
24.840	0.6288	1.50	10.000	352.94300	362.078	9.935	74.0	74.0	88.5	84	13.05	1.0031	1.703
24.840	0.6317	1.50	10.000	362.97000	372.808	9.930	74.0	74.0	90.0	84	12.99	1.0054	1.684
24.840	0.3663	0.50	5.000	342.88300	347.907	5.018	74.0	74.0	87.0	83	11.20	1.0061	1.675
24.840	0.3657	0.50	5.000	347.90700	352.943	5.036	74.0	74.0	88.0	84	11.22	1.0049	1.678

VACUUM GAUGE CALIBRATION

STD (kg)	VAC GAUGE
5.0	5.000
10.0	10.000
15.0	15.000
20.0	20.000
22.0	23.000

THERMOMETER CALIBRATION

STANDARD	INLET	OUTLET
80	80.000	80.000
100	100	100
120	119	120
140	140	138
160	160	159
180		

DATE: 15 May 92

OPERATOR: Jonathan Dellinger

METER BOX NO.: D-5

CLIENT/DHMR Colorado Incineration

JOB#: 6191

2418 COOHN 63" CHOHREY-CORIGHT 200" COOHN 73"

POST TEST CALIBRATION CHECK

METER BOX Yd: 0.9969

DATE: 9/11/92

JOB#: COORS
6317

CLIENT/OWNER: TRISTATE

OPERATOR: RTH

METER BOX NUMBER: 0-5

METER BOX VACUUM: 10

Sp	0	dH	dP	Yds	MET TEST VOLUME		METER Vds	DRY VOLUME		GAS VOLUME	METER HETER		MET TEST METER TEMPERATURES		DRY GAS METER TEMPERATURES		TIME	Yd	dHS
					INITIAL	FINAL		INITIAL	FINAL		IN	OUT	Tds	IN	OUT	IN			
24.950	0.6103	1.50	-7.9	1.00	0.000	11.000	11.000	888.52000	899.520	11.000	74.0	74.0	74.0	83	87.5	14.84	0.9970	1.807	
24.950	0.6110	1.50	-7.6	1.00	0.000	10.000	10.000	839.52000	909.570	10.000	74.0	74.0	74.0	84	89.0	13.49	0.9957	1.801	
24.950	0.6073	1.50	-7.6	1.00	0.000	10.000	10.000	909.57000	919.650	10.000	74.0	74.0	74.0	87	91.5	13.57	0.9981	1.811	

846Coors finale

FILE: -----

Scott Specialty Gases

a division of
Scott Environmental Technology, Inc.

1290 COMBERMERE STREET, TROY, MICHIGAN 48084 (313) 589-2950

Shipped from : Scott Michigan

Our Project # : 530469

Your P.O. # : 3750-715

Expiration Date : 6-3-93

Cylinder Number : ALM-010255

Cylinder Pressure : 1900 psig

*** CERTIFICATE OF ANALYSIS - EFA PROTOCOL GASES ***
 PERFORMED ACCORDING TO SECTION 3.0.4
 Certified Per Traceability Procedure # GI
 Protocol # 1 File # PQ-1733

Certified Accuracy 1 % NRS Traceable

INSTRUMENTATION

ANALYTICAL PRINCIPLE
 FLAME IONIZATION DETECTOR

LAST CALIBRATION DATE
 10-25-91

INSTR/MODEL/SERIAL #
 BECKMAN 400

REFERENCE STD
 CONCENTRATION
 98.54 PPM
 48.40 PPM

CYLINDER NUMBER
 CAL-2522
 XA4113

Customer :
 C A E INSTRUMENT RENTAL
 246 WOODWORK LANE
 PALATINE, IL. 60067

ANALYZED	CYLINDER	CERTIFIED CONCENTRATION	SRM # (CRM #)	CYLINDER NUMBER	CONCENTRATION
RUFANE		55.52 PPM	2643	CAL-2522	98.54 PPM
			GMS#	XA4113	48.40 PPM

BALANCE GAS : NITROGEN

DATE : 12-3-91

ANALYSIS

ZERO GAS (mV)	TEST GAS (mV)	REFERENCE GAS CONCENTRATION	RESULTS PPM	RESULTS PPM
0.00	57.00	98.54 PPM	55.52	98.54
0.00	57.00	100.00	55.52	98.54
0.00	57.00	100.00	55.52	98.54

CALCULATED RESULTS
 55.52
 55.52
 55.52

AVERAGE : 55.52 PPM

CALIBRATION CURVE

SRM # (CRM #)	CONCENTRATION (PPM)	SPLIT RATIO (%)	DVM VALUE (mV)	FITTED VALUE	PERCENT ERROR
2643	98.54	100	100.00	98.54	-0.00
	48.40	49	49.90	48.52	0.24
	25.80	26	26.60	25.75	-0.20
	10.36	11	10.50	10.20	-1.57
	0.00	0	0.00	0.00	0.00
	0.00	0	0.00	0.00	0.00
	0.00	0	0.00	0.00	0.00

SRM #	CONCENTRATION (PPM)	LOH	LOM	HIH	HILO
2643	98.54	100.00	10.50	10.20	-1.57

The only liability of this Company for gas which fails to comply with this analysis shall be replacement thereof by the Company without extra charge.

1290 COMBERMERE STREET, TROY, MICHIGAN 48084 (313) 589-2950

Our Project #: 527476

Your P.O. #: 3114-71500

Expiration Date: 2-27-93

Customer:
C A E INSTRUMENT RENTAL
246 WOODWORK LANE
PALATINE, IL. 60067

*** CERTIFICATE OF ANALYSIS - EPA PROTOCOL GASES ***
PERFORMED ACCORDING TO SECTION 3.0.4
Certified Per Traceability Procedure # 61
Protocol # 1
File # PO-1125

Cylinder Number: ALM-023262

Cylinder Pressure: 1900 psig

Certified Accuracy 1% NBS Traceable

ANALYZED	CYLINDER	CERTIFIED CONC.	REFERENCE STD		INSTR/MODEL/SERIAL #	LAST CALIBRATION DATE
			SRM # (CRM #)	CYLINDER NUMBER		
PROPANE	24.49 PPM	24.49 PPM	2643	CAL-2522	BECKMAN 400	8-27-91
			6MISA	XA4113		

BALANCE GAS: NITROGEN

DATE: 8-27-91

ANALYSIS			CALIBRATION CURVE			2nd DEGREE		
ZERO	TEST	REFERENCE	SRM #	CONC. (CRM #)	SPLIT PT (X)	DVM (mV)	FITTED VALUE	PERCENT ERROR
GAS (mV)	GAS (mV)	GAS (mV)	2643	98.54	100	100.00	98.54	-0.00
0.00	25.30	24.49		48.40	49	49.90	48.52	0.24
0.00	25.30	24.49		25.80	26	26.60	25.75	-0.20
0.00	25.30	24.49		10.36	11	10.50	10.20	-1.57
				0.00	0	0.00	0.00	0.00
				0.00	0	0.0000	0.0000	0.00
				0.00	0	0.00	0.00	0.00
CALCULATED RESULTS			6MIS	10.36	LOW	10.50	10.20	-1.57
AVERAGE: 24.49 PPM			2643	98.54	100.00	100.00	98.54	-0.00

*** GMS - GAS MANUFACTURER'S INTERNE CERTIFICATION OF THIS COMPANY ANALYSIS WHICH CALLS FOR GMS WITH THIS ANALYSIS SHALL BE AT THE PLACEMENT THEREOF PROVIDED COMPANY WITHOUT EXTRA COST ***

[Signature]

COORS BREWING COMPANY
CAE Project No: 6362-1

WEIGHT SHEETS

5-5

Particulate Testing Weight Sheet

Client <u>CCERS BREWING CO</u>	Project Number <u>6265 6362</u>	Analyst
Plant <u>GOLDEN CO.</u>	Unit <u>SPENT GRAIN DRYER #9</u>	Balance <u>FISHER</u>
Test Date <u>22, 23 AUG 92</u>		

Description	Wt. No.	I.D. and Sample Description ¹	Sample volume (ml) ²	Date/Time	Gross Weight (g)	Tare Weight (g)	Date/Time	Net Weight (g)	
Type <u>F 1/2</u>	<u>1</u>	<u>250ml</u> <u># 10</u>	<u>150</u>	<u>8-27/0851</u>	<u>101.4254</u>	<u>101.3497</u>	<u>8/25 945</u>	<u>0.0766</u>	
Run <u>1</u>				<u>8/28 1700</u>	<u>101.4262</u>	<u>101.3794</u>	<u>8/25 1611</u>		
Location <u>INLET</u>				<u>8/31 0705</u>	<u>101.4262</u>	<u>101.3497</u>			
			T F <input checked="" type="checkbox"/>						
Type	<u>2</u>	<u>250ml</u> <u># AR 65</u>				<u>107.8199</u>	<u>8/25 946</u>		
Run						<u>107.8193</u>	<u>8/25 1610</u>		
Location									
			T F <input checked="" type="checkbox"/>						
Type <u>F 1/2</u>	<u>4</u>	<u>250ml</u> <u># AI 65</u>	<u>165ml</u>	<u>8-27/0850</u>	<u>103.4541</u>	<u>103.3712</u>	<u>8/25 748</u>	<u>0.0852</u>	
Run <u>3</u>				<u>8/28 1700</u>	<u>103.4565</u>	<u>103.3709</u>	<u>8/25 1608</u>		
Location <u>INLET</u>					<u>103.4565</u>	<u>103.3711</u>			
			T F <input checked="" type="checkbox"/>						
Type <u>F 1/2</u>	<u>5</u>	<u>250ml</u> <u># AV 65</u>	<u>270ml</u>	<u>8-27/0859</u>	<u>103.5362</u>	<u>103.3035</u>	<u>8/25 949</u>	<u>0.2328</u>	
Run <u>4</u>				<u>8/28 1700</u>	<u>103.5357</u>	<u>103.3030</u>	<u>8/25 1609</u>		
Location <u>INLET</u>					<u>103.5357</u>	<u>103.3032</u>			
			T F <input checked="" type="checkbox"/>						
Type <u>F 1/2</u>	<u>6</u>	<u>250ml</u> <u># AC 65</u>	<u>135ml</u>	<u>8-27/0853</u>	<u>108.6390</u>	<u>108.6107</u>	<u>8/25 150</u>	<u>0.0285</u>	
Run <u># 1</u>				<u>8/28 1658</u>	<u>108.6392</u>	<u>108.6105</u>	<u>8/25 1646</u>		
Location <u>OUTLET</u>					<u>108.6391</u>	<u>108.6106</u>			
			T F <input checked="" type="checkbox"/>						
Type <u>F 1/2</u>	<u>8</u>	<u>250ml</u> <u># AF 65</u>	<u>125ml</u>	<u>8-27/0852</u>	<u>104.8898</u>	<u>104.8761</u>	<u>8/25 752</u>		
Run <u>3</u>				<u>8/28 1651</u>	<u>104.8889</u>	<u>104.8764</u>	<u>8/25 1603</u>		
Location <u>OUTLET</u>				<u>8/31 0909</u>	<u>104.8898</u>	<u>104.8763</u>			
			T F <input checked="" type="checkbox"/>						
Type	<u>9</u>	<u>250ml</u> <u># 109</u>				<u>104.8900</u>	<u>101.7255</u>	<u>8/25 753</u>	
Run							<u>101.7262</u>	<u>8/25 1605</u>	
Location									
			T F <input checked="" type="checkbox"/>						
Type <u>F 1/2</u>	<u>10</u>	<u>250ml</u> <u># 131</u>	<u>100ml</u>	<u>8-27/0858</u>	<u>100.5685</u>	<u>100.5478</u>	<u>8/25 954</u>	<u>0.0208</u>	
Run <u>4</u>				<u>8/28 1650</u>	<u>100.5687</u>	<u>100.5477</u>	<u>8/25 1604</u>		
Location <u>OUTLET</u>					<u>100.5686</u>	<u>100.5478</u>			
			T F <input checked="" type="checkbox"/>						

¹ Note appearance of particulate
² Two volumes (e.g. 500/100) indicate an aliquot was taken.
 Indicate (T)himbler, (F)ilter, or (B)eaker in box below.



Particulate Testing Weight Sheet

Page 1 of 1

Client <u>COORS BREWING CO.</u>	Project Number <u>6362-1</u>	Analyst <u>gsp</u>
Plant <u>GOLDEN, CO.</u>	Unit <u>SPENT GRAIN DRYER #9</u>	Balance <u>KA 200</u>
Test Date <u>22, 23 AUG 92</u>	FISHER #4581	

Description	Wt. No.	I.D. and Sample Description ¹	Sample volume (ml) ²	Date/Time	Gross Weight (g)	Tare Weight (g)	Date/Time	Net Weight (g)
Type	1	BROWN DUST 10000	T(F)B	8/25 1051	0.5175	.5214	8/10 8 ³⁰ A	
Run 4				8/25 1657	0.5176	.5213	8/10 15 ¹⁵	
Location ^{SC-D} OUTLET						(0.5176)	(.5214)	
Type	3	BROWN DUST 10002	T(F)B	8/25 1049	0.5219	.5224	8/10 8 ³⁰ A	
Run 1				8/25 1650	0.5220	.5220	8/10 15 ⁰⁰	
Location ^{SC-D} OUTLET						(0.5220)	(0.5222)	
Type	4	BROWN DUST 10003	T(F)B	8/25 1045	0.5213	.5198	8/10 8 ³⁰ A	
Run 3				8/25 1634	0.5210	.5191	8/10 15 ¹⁰	
Location ^{SC-D} OUTLET						(0.5212)	(0.5192)	8/11 8 ³⁰
Type	5	BROWN DUST 10004	T(F)B	8/25 1024	0.5718	.5179	8/10 8 ³⁰ A	
Run 3				8/25 1632	0.5718	.5177	8/10 15 ¹⁰	
Location ^{SC-D} INLET						(0.5718)	(0.5177)	
Type	7	BROWN GRAINS DUST 10006	T(F)B	8/25 1035	0.7994	.5206	8/10 8 ³⁰ A	
Run 1				8/25 1630	0.7973	.5205	8/10 15 ¹⁰	
Location ^{SC-D} INLET				8/26 0730	.7973			
Type	8	BROWN FIBROUS GRAIN 10007	T(F)B	8/25 1022	0.7364	.5188	8/10 8 ³⁰ A	
Run 4					0.7372	.5187	8/10 15 ¹⁵	
Location ^{SC-D} INLET				8/26 0731	.7363			
Type	9	10008	T(F)B	8/26 1053	.7361	(0.7362)	(0.5188)	
Run						.5191	8/10 8 ³⁰ A	
Location						.5194	8/10 15 ¹⁵	
Type	10	10009	T(F)B			.5195	8/10 8 ³⁰ A	
Run						.5197	8/10 15 ¹⁵	
Location								

¹Note appearance of particulate
²no volumes (e.g. 500/100) indicate an aliquot was taken.
 Indicate (T)himbler, (F)ilter, or (B)aker in box below.

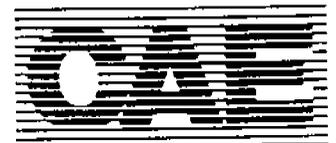


Particulate Testing Weight Sheet

Client <u>COORS BREWING CO</u>	Project Number <u>636Z-1</u>	Analyst
Plant <u>GOLDBO CO</u>	Unit <u>SPENT GRAIN DRYER#9</u>	Balance <u>FISHER</u>
Test Date <u>27, 23 AUG 92</u>		

Description	Wt. No.	I.D. and Sample Description ¹	Sample volume (ml) ²	Date/Time	Gross Weight (g)	Tare Weight (g)	Date/Time	Net Weight (g)
Type <u>BLANK</u>	1	250ml #301	150ml /	<u>8/25 1601</u>	<u>98.7668</u>	<u>98.7642</u>	<u>8/25 955</u>	<u>0.0012</u>
Run				<u>8/28 1648</u>	<u>98.7675</u>	<u>98.7646</u>	<u>8/25 1601</u>	<u>150ml</u>
Location				<u>8/31 0907</u>	<u>98.7630</u>	<u>98.7640</u>		
Type	2	250ml #106	/	<u>8/25 1602</u>	<u>103.7508</u>	<u>103.7508</u>	<u>8/25 956</u>	
Run						<u>103.7510</u>	<u>1600</u>	
Location				<u>T F B</u>				
Type	3		/					
Run								
Location				<u>T F B</u>				
Type	4		/					
Run								
Location				<u>T F B</u>				
Type	5		/					
Run								
Location				<u>T F B</u>				
Type	6		/					
Run								
Location				<u>T F B</u>				
Type	7		/					
Run								
Location				<u>T F B</u>				
Type	8		/					
Run								
Location				<u>T F B</u>				
Type	9		/					
Run								
Location				<u>T F B</u>				
Type	10		/					
Run								
Location				<u>T F B</u>				

¹ Note appearance of particulate
² Two volumes (e.g. 500/100) indicate an aliquot was taken.
 Indicate (T)himble, (F)ilter, or (B)eaker in box below.



COORS BREWING COMPANY
CAE Project No: 6362-1

FIELD DATA

5-6

Orsat Readings

6362-1

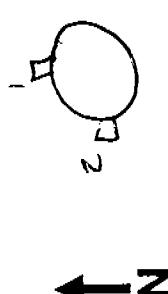
Client <u>Coors Brewing Co</u>	Project Number <u>6265^{kn}</u>	$F_o = \frac{20.9 - \%O_2}{\%CO_2}$ $F_o = 1.083 \text{ to } 1.230$ (for bituminous coal)
Plant <u>GOLDEN, CO.</u>	Unit <u>SPENT GRAIN DRYER#9</u>	
Date <u>21 AUG 92</u>	Fuel Type <u>NA</u>	
Orsat ID	Leak Check? <u>O.K.</u>	

Run Number	Location	Bag ID	Trial	Percent CO ₂	Percent CO ₂ + O ₂	Percent O ₂	F _o	Sample Time	Analysis Time	Analyst
R-1	INLET	R-1 I	1	0.0	21.0			12:10	13:00	M.H
			2	0.0	21.0					
			3	0.0	21.0					
			Avg.	0.0	21.0	21.0				
								21 AUG		
R-1	OUTLET	R-1 O	1	0.0	20.8			11:35	13:15	M.H
			2	0.0	21.0					
			3	0.0	21.0					
			Avg.	0.0	20.9	20.9				
								21 AUG		
R-3	INLET	R-3 I	1	0.0	21.0			10:00	11:30	M.H
			2	0.0	21.0					
			3	0.0	21.0					
			Avg.	0.0	21.0	21.0				
								22 AUG		
R-3	OUTLET	R-3 O	1	0.0	20.9				11:40	M.H
			2	0.0	21.0					
			3	0.0	21.0					
			Avg.	0.0	21.0	21.0				
								22 AUG		
R-4	INLET	R-4 I	1	0.0	21.0				13:35	M.H
			2	0.0	20.9					
			3	0.0	20.9					
			Avg.	0.0	20.9	20.9				
								22 AUG		
R-4	OUTLET	R-4 O	1	0.0	21.0				13:45	M.H
			2	0.0	21.0					
			3	0.0	21.0					
			Avg.	0.0	21.0	21.0				
								22 AUG		
			1							
			2							
			3							
			Avg.							
			1							
			2							
			3							
			Avg.							



Particulate Testing Field Data Sheet

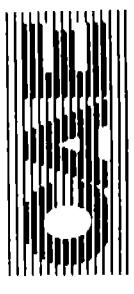
Location: INLET Run: 0362
 Client: COORS Project Number: 6265
 Plant: Calumet Unit: INLET/outlet/stack
 Date: 8-22-82
 Meter Operator: J MOLINARO
 Probe Operator: _____

Schematic of Testing Location

 First point all the way IN OUT Method S
 Area (ft²): 2.021 Port Len. (in.): 2.74 Gas Flow IN OUT
 Filter Number: 10006
 Thimble Number: _____
 Beaker Number: _____

Sample Box Number: 3 Pyrometer Number: D4
 Meter Box Number: 84
 Meter ΔH@: 1.636 Meter Yd: 9.446
 K Factor: 5.72 Pilot Cp: 5.84
 Pilot Leak Check: Before After _____
 Leak Rate Before: 0 CFM @ 15 "Hg
 Leak Rate After: 0 CFM @ 5 "Hg
 Static Pressure (inches H₂O) (+/-): -4.4

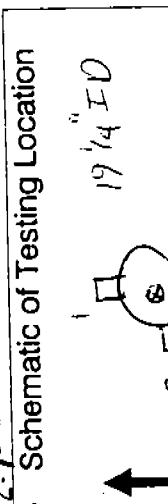
Ambient Temp. (°F): 81 Bar. Press. (in. Hg): 24.37
 Assumed Moisture (%): 32.20
 Heater Box Setting: 250 Probe Heater Setting: 250
 Probe Length: 4' Probe Number: 65-435
 Probe Material: SS Acetone Number: _____
 Nozzle Diameter (in.): .1865 Nozzle Number: 65-1-1865
 IGS Bag ID Number: E-1
 % O₂: 21.0 % CO₂: 0.0
 H₂O (ml): 320 Silica Gel (gm): 8.3
 Total V_{ic}: 38.3
 Start Time: 12:10 AM (PM) Stop Time: 13:15 AM / PM

Transpose Point Number	Min/pt	Clock time	Pump Vacuum (in. Hg)	Stack Temp. T _s (°F)	Velocity Head ΔPs	Orifice Setting ΔH (in. H ₂ O)	Initial Volume Gas Sample Volume V _m (ft ³)	Gas Sample Temperature at Dry Gas Meter		Comd. Temp. T _c (°F)	Filter Temp. T _f (°F)	Probe Temp. (°F)	Notes
								Inlet T _{in} (°F)	Outlet T _{out} (°F)				
1	5	5	3	165	2	1.144	119.53	96	96	38	265	250	70I = 108.6
2	10	10	3	166	2.3	1.32	126.57	100	97	42	259	274	
3	15	15	3	168	1.8	1.03	128.02	102	97	46	254	272	
4	20	20	3	167	.88	.503	132.64	103	98	48	252	270	
5	25	25	3	160	.98	.561	135.92	103	98	50	263	262	
6	30	30	1	167.5	.98	.521	137.68	102	99	52	262	262	
1	35	35	2	165	1.3	.744	140.69	100	100	48	264	274	
2	40	40	2	166	1.0	.572	143.20	104	101	48	265	270	
3	45	45	2	166	1.2	.646	145.91	105	101	50	269	269	
4	50	50	3	166	1.2	.686	148.67	107	102	54	268	258	
5	55	55	2	165	1.0	.572	151.25	107	103	56	265	249	
6	60	60	3	164	1.2	.684	154.01	107	103		261	258	
Total				177	13.617	7.03	34.48	1236	1195				
Average				165	1.135	.75		101					



Particulate Testing Field Data Sheet

Location: SPENT COOK'S 362.4
 Run: 2-2A-588 Bar. Press. (in. Hg) 24.37
 Ambient Temp. (°F) 88 Assumed Moisture (%)



Client: COOK'S
 Plant: COOK'S
 Date: 8-23-92
 Meter Operator: MOLINARO
 Probe Operator: MOLINARO

Sample Box Number 3 Pyrometer Number D4
 Meter Box Number D4
 Meter ΔH@ 1.636 Meter Yd .9946
 K Factor .3637493 Pilot Cp .24
 Pitot Leak Check: Before After
 Leak Rate Before 0 CFM @ 15 "Hg
 Leak Rate After CFM @ "Hg
 Static Pressure (inches H2O) (+/-) -3.6

Heater Box Setting 250 Probe Heater Setting 250
 Probe Length 4' Probe Number 65-4
 Probe Material SS Acetone Number
 Nozzle Diameter (in.) .185 Nozzle Number 65-1865-1

IGS Bag ID Number 8-2A
 % O2 21.0 % CO2 0
 H2O (ml) 36.5 Silica Gel (gm) 7.8
 Total Vlc 372.8

Start Time 10 (AM/PM) AM Stop Time 122 AM / PM

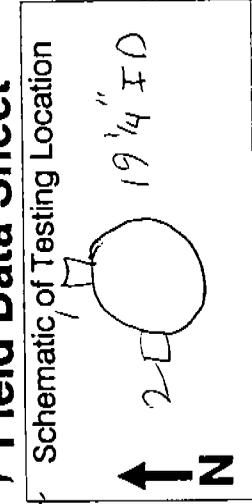
Traverse Point Number	Min/pt	Clock time	Pump Vacuum (in. Hg)	Stack Temp. T _s (°F)	Velocity Head ΔPs	Orifice Setting ΔH (in. H2O)	Initial Volume Gas Sample Volume V _m (ft ³)	Gas Sample Temperature at Dry Gas Meter		Filter Temp. T _f (°F)	Probe Temp. T _p (°F)	Notes
								Inlet T _m in (°F)	Outlet T _m out (°F)			
1	6	6	2	167	2.1	1.04	230.510 234.41	96	93	262	248	
2	12	3	3	167	2.1	1.04	238.53	98	93	259	249	7.0 I = 97.5
3	18	2	2	168	1.6	.79	242.24	100	94	264	267	
4	24	1	1	167	.86	.42	245.04	101	94	252	269	
5	30	1	1	164	.94	.46	247.83	100	94	251	261	
6	36	1	1	168	.96	.47	250.515	99	94	245	250	.358 ΔK
2-1	42	1	1	163	1.4	.51	253.35	97	95	249	256	7 T _m < 105
2	48	1	1	165	1.2	.43	255.9	99	94	243	249	K _{af} (T _m =) K _A = F (T _m = 98")
3	54	1	1	165	1.0	.36	258.53	100	95	249	268	
4	60	1	1	166	1.4	.5	261.48	99	95	249	267	
5	66	1	1	165	1.0	.36	263.88	100	96	250	266	
6	72	1	1	165	1.0	.36	266.250	99	95	249	266	
Total					13.502	6.74	35.174					
Average				166	1.125	0.56						

SPENT CRAIN
Run: B4 6362-1

Particulate Testing Field Data Sheet

Page 2 of 2

Location: INLET
Client: COORS
Plant: GOLDEN CO
Date: 8-23-97
Meter Operator: J. FLOINARD
Probe Operator: J. FLOINARD



Ambient Temp. (°F) 90
Assumed Moisture (%) 38.76
Bar. Press. (in. Hg) 24.37

Heater Box Setting 250
Probe Length 41
Probe Material SS
Nozzle Diameter (in.) 1/8

Probe Heater Setting 250
Probe Number 65-41
Acetone Number
Nozzle Number 65-1865

Sample Box Number 3
Meter Box Number D4
Meter ΔH@ 1.636
K Factor .36
Pitot Leak Check: Before After ✓
Leak Rate Before 0
Leak Rate After 0
Static Pressure (inches H2O) (+) - 3.6

Pyrometer Number D4
Meter Yd 1.9946
Pitot Cp 0.84
CFM @ 12" Hg
CFM @ 6" Hg

First point all the way IN OUT Method

Area (ft²) 2.07
Port Len. (in.) 24
Gas Flow IN OUT

Filter Number 10007
Thimble Number
Beaker Number

IGS Bag ID Number R4
% O2 21.0
H2O (ml) 383
Total Vic 392.6

% CO2 0
Silica Gel (gm) 9.6

Start Time 12:00 AM PM Stop Time 13:27 AM / PM

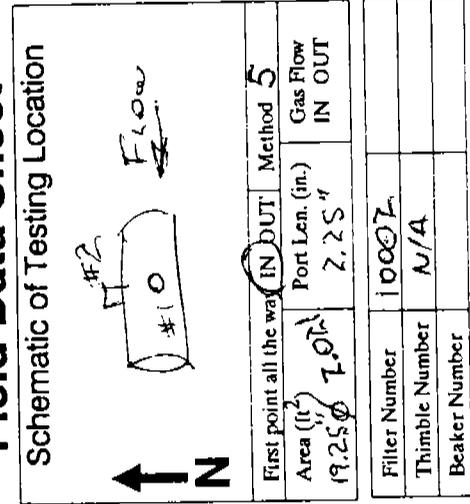
Traverse Point Number	Min/pi	Clock time	Pump Vacuum (in. Hg)	Stack Temp. Ts (°F)	Velocity Head ΔPs	Orifice Scouting ΔH (in. H2O)	Initial Volume Gas Sample Volume Vm (ft³)	Gas Sample Temperature at Dry Gas Meter		Cond. Temp. Tc (°F)	Filter Temp. Tf (°F)	Probe Temp. (°F)	Notes
								Inlet Tm In (°F)	Outlet Tm Out (°F)				
2-1	6	6	4	165	1.5	.58	274.31	99	97	34	250	258	75.2
2	18	18	4	163	1.2	.47	277.06	100	97	34	256	254	
3	18	18	2	165	1.2	.43	279.78	101	98	38	250	249	
4	24	24	2	165	1.5	.58	282.91	102	98	40	251	243	
5	30	30	1	164	1.1	.39	285.48	102	98	40	257	253	
6	36	36	2	165	1.4	.5	288.35	102	98	42	261	256	AK 7.42
1-1	42	42	2	169	2.0	.72	291.66	100	98	36	276	275	START
2	48	48	2	168	1.9	.79	295.12	102	96	38	268	249	
3	54	54	1	160	1.3	.54	298.96	103	98	40	260	246	
4	60	60	1	159	.93	.39	300.86	103	99	42	269	252	
5	66	66	1	161	1.0	.42	303.46	103	99	44	270	254	
6	72	72	1	162	1.0	.42	306.29	104	100	48	268	240	
Total	78	78		1951	13.82	6.23	35.06	2397					
Average	12.67	12.67		163	1.151	.62		99.875					



Location: DEYER #9 Run: 6362-1
 Client COORS Project Number 6765
 Plant Unit SGT #19
 Date 8/22/92 Inlet/Outlet/Stack
 Meter Operator G2 PAVLAKIS
 Probe Operator G2 PAVLAKIS

Particulate Testing Field Data Sheet

Page 1 of 1
 Ambient Temp. (°F) 96 Bar. Press. (in. Hg) 24.37
 Assumed Moisture (%)



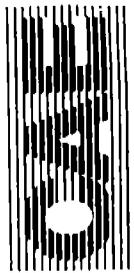
Sample Box Number K0 Pyrometer Number D-5
 Meter Box Number D-5
 Meter ΔH@ 1.6764 Meter Yd 1.0078
 K Factor Pilot Cp .84
 Pitot Leak Check: Before After
 Leak Rate Before .004 CFM @ 14" Hg
 Leak Rate After .003 CFM @ 9" Hg
 Static Pressure (inches H₂O) (+/-) -.3" H₂O

Heater Box Setting 250°F Probe Heater Setting 250°F
 Probe Length 4' Probe Number
 Probe Material SS Acetone Number
 Nozzle Diameter (in.) .196 Nozzle Number

IGS Bag ID Number 307-2-1
 % O₂ 20.9 % CO₂ 0
 H₂O (ml) 616 Silica Gel (gm) 14
 Total Vol 630

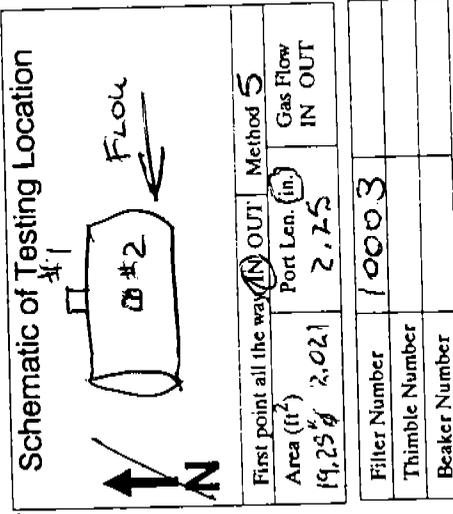
Start Time 11:35 AM Stop Time 13:32 AM / PM

Traverse Point Number	Min/pt	Clock time	Pump Vacuum (in. Hg)	Stack Temp. T _s (°F)	Velocity Head ΔPs	Orifice Setting ΔH (in. H ₂ O)	Gas Sample Temperature at Dry Gas Meter		Initial Volume Gas Sample Volume V _m (ft ³)	Inlet T _{in} (°F)	Outlet T _{out} (°F)	Cond. Temp. T _c (°F)	Filter Temp. T _f (°F)	Probe Temp. (°F)	Notes
							Inlet T _{in} (°F)	Outlet T _{out} (°F)							
1-1	8	8	6.0	156	1.6	1.1	98	95	65.512	98	95	64	252	250	
2	16	16	7.0	157	1.4	.99	100	96	90.50	100	96	69	250	250	
3	24	24	7.0	149	1.2	.90	101	96	100.40	101	96	69	250	252	
4	32	32	5.0	148	.98	.73	102	97	104.85	102	97	68	250	252	
5	40	40	6.0	149	1.1	.80	102	97	109.39	102	97	68	250	255	
6	48	48	6.0	150	1.1	.79	102	98	113.90	102	98	68	250	256	
2-1	8	8	5.0	157	1.2	.72	100	97	118.23	100	97	60	249	249	
2	16	16	5.0	156	1.2	.72	100	97	122.50	100	97	64	251	248	
3	24	24	5.0	159	1.0	.58	101	98	126.41	101	98	64	251	248	
4	32	32	6.0	151	1.2	.86	102	98	131.05	102	98	65	251	256	
5	40	40	7.0	158	1.4	.84	102	98	135.77	102	98	66	251	264	B _{low} = .41
6	48	48	8.0	154	1.4	.95	103	97	140.743	103	97	67	251	260	%I 106.5
Total	96														
Average				153.29	1.107	.832	99		55.231						



Particulate Testing Field Data Sheet

Location: **COORS** Run: **3** Project Number **6362-1**
 Unit **SD 9**
 Plant **GOLDEN CO** Inlet **6010/stack**
 Date **8/23/92** Meter Operator **GSP**
 Probe Operator **GSP**



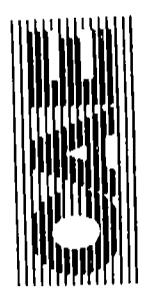
First point all the way IN OUT Method **5**
 Area (ft²) **19.25** Port Len. (in.) **2.25** Gas Flow IN OUT
 Filter Number **10003**
 Thimble Number
 Beaker Number

Heater Box Setting **250** Probe Heater Setting **260**
 Probe Length **4'** Probe Number
 Probe Material **SS** Acetone Number
 Nozzle Diameter (in.) **.196** Nozzle Number

IGS Bag ID Number **R-3** % CO₂ **0**
 % O₂ **21.0** Silica Gel (gm) **7**
 H₂O (ml) **421**
 Total Vic **428**

Start Time **9:55 AM** Stop Time **11:23 AM** PM

Traverse Point Number	Min/pt Clock time	Pump Vacuum (in. Hg)	Stack Temp. T _s (°F)	Velocity Head ΔP _s	Orifice Setting ΔH (in. H ₂ O)	Initial Volume Gas Sample Volume V _m (ft ³)	Gas Sample Temperature at Dry Gas Meter		Cond. Temp. T _c (°F)	Filter Temp. T _f (°F)	Probe Temp. T _p (°F)	Notes
							Inlet T _{in} (°F)	Outlet T _{out} (°F)				
1-1	7	3	157	.98	.58	214.12	91	91	63	254	265	
2	14	3	156	.98	.58	217.51	91	90	64	248	257	
3	21	3	157	1.1	.64	221.12	92	90	60	250	269	
4	28	4	158	1.4	.83	225.07	94	91	58	263	258	
5	35	4	156	1.3	.78	228.98	96	91	59	260	261	
6	42	4	153	1.2	.78	232.84	96	92	58	260	259	
2-1	7	4	162	1.5	.78	236.73	96	92	58	260	259	
2	14	4	161	1.4	.77	240.54	96	92	59	260	261	
3	21	4	162	1.2	.88	243.91	97	93	61	260	257	
4	28	3	162	.97	.44	246.87	98	94	62	260	273	
5	35	3	162	.93	.42	249.77	98	94	64	260	274	8w0:38
6	42	3	162	.89	.40	252.651	98	93	64	260	273	%T=93
Total	84											
Average			159	1.07	.632	41.917	94					



Location: STOUT GRAN 6362-1 4 6362-1
DRYER #9 Run:
 Client COORS Project Number 2265
 Plant GOLDEN CO Unit SGD #9
 Date 8/23/92 Inlet/Outlet Stack
 Meter Operator SEPAVLOVIC
 Probe Operator SS PAVLOVIC

Particulate Testing Field Data Sheet

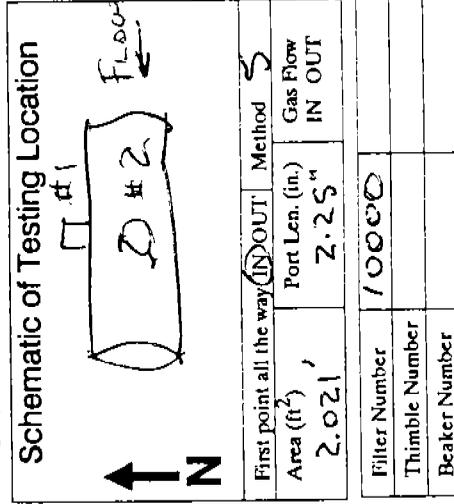
Page 1 of 1

Ambient Temp. (°F) 83 Bar. Press. (in. Hg) 24.37
 Assumed Moisture (%) 4

Heater Box Setting 260 Probe Heater Setting 250
 Probe Length 4' Probe Number 4'
 Probe Material SS Acticene Number
 Nozzle Diameter (in.) 1.96 Nozzle Number

IGS Bag ID Number R-4 SGD #9
 % O2
 H₂O (ml) 480 Silica Gel (gm) 11
 Total Vol 491

Start Time 12:11 AM (PM) Stop Time 1:38 AM (PM)



Sample Box Number 65-4 Pyrometer Number D-5
 Meter Box Number D-5
 Meter ΔH@ 1.6764 Meter Yd 1.0078
 K Factor 84 Pilot Cp 84
 Pitot Leak Check: Before 0 After 0
 Leak Rate Before 007 CFM @ 16" Hg
 Leak Rate After 000 CFM @ 10" Hg
 Static Pressure (inches H₂O) (+0 -0.6)

Traverse Point Number	Min/pt	Pump Vacuum (in. Hg)	Stack Temp. T _s (°F)	Velocity Head ΔPs	Orifice Setting ΔH (in. H ₂ O)	Initial Volume		Gas Sample Temperature at Dry Gas Meter		Cond. Temp. T _c (°F)	Filter Temp. T _f (°F)	Probe Temp. T _p (°F)	Notes
						Gas Sample Volume V _m (ft ³)	Gas Sample Volume V _m (ft ³)	Inlet T _{in} (°F)	Outlet T _{out} (°F)				
1-1	7	2	164	.82	.41	256.594	259.51	98	96	67	262	249	
2	14	3	163	.83	.41	262.39	262.39	97	96	66	264	253	
3	21	3	165	.96	.48	265.66	265.66	99	97	66	261	255	
4	28	4	165	1.3	.75	269.50	269.50	100	97	65	261	255	
5	35	4	164	1.3	.75	273.42	273.42	102	98	65	260	253	
6	42	4	163	1.3	.75	277.38	277.38	103	98	66	260	253	
2-1	7	4	163	1.4	.84	281.58	281.58	103	99	61	258	253	
2	14	4	162	1.2	.78	285.45	285.45	104	99	60	260	255	
3	21	4	160	1.2	.80	289.41	289.41	104	99	60	260	250	
4	28	4	160	1.0	.65	293.03	293.03	105	100	61	260	249	
5	35	4	159	1.0	.68	296.77	296.77	105	101	62	260	255	%I = 102
6	42	4	158	.94	.66	300.494	300.494	106	101	62	260	255	BWO = .40
Total	84												
Average			162.2	1.047	.663	43.9		100.3					

"COORS BREWING "
 "SPENT GRAIN DRYER 3"
 " 6-22-1992"
 "10:04:57.35"

"Time" "TH01" "	"DMMS" " ppm" "	ppm"
00:00:00:00.000	-0	0
00:00:00:59.999	-0	0
00:00:01:59.999	-0	0
00:00:02:59.999	-0	0
00:00:03:59.999	-0	0
00:00:04:59.999	-0	0
00:00:05:59.999	-0	0
00:00:06:59.999	-0	0
00:00:07:59.999	-0	0
00:00:08:59.999	-0	0
00:00:09:59.999	-0	0
00:00:10:59.999	-0	0
00:00:11:59.999	-0	0
00:00:12:59.998	-0	0
00:00:13:59.998	32	0
00:00:14:59.998	82	0
00:00:15:59.998	82	0
00:00:16:59.998	63	0
00:00:17:59.998	63	0
00:00:18:59.998	24	0
00:00:19:59.998	24	0
00:00:20:59.998	66	0
00:00:21:59.998	43	0
00:00:22:59.998	2	0
00:00:23:59.998	2	0
00:00:24:59.997	2	0
00:00:25:59.997	.2	0
00:00:26:59.997	-6	0
00:00:27:59.997	-0	0
00:00:28:59.997	4	0
00:00:29:59.997	54	0
00:00:30:59.997	28	0
00:00:31:59.997	3	0
00:00:32:59.997	3	0
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00:00:35:59.997	44	0
00:00:36:59.997	28	0
00:00:37:59.998	28	0
00:00:38:59.998	25	0
00:00:39:59.998	25	0
00:00:40:59.998	18	0
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00:00:47:59.998	2	0
00:00:48:59.998	2	0
00:00:49:59.998	1	0
00:00:50:59.998	1	0
00:00:51:59.998	1	0

75.52 CAL

0 CAL

55.56 CAL

2449 CAL

HECK

00:00:53:59.995	-0	0
00:00:54:59.995	7	0
00:00:55:59.995	17	0
00:00:56:59.995	35	0
00:00:57:59.995	40	0
00:00:58:59.995	32	0
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00:01:35:59.992	31	0
00:01:36:59.992	23	0
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00:01:54:59.990	39	0
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00:01:56:59.990	31	0
00:01:57:59.990	30	0

START RUN

00:01:59:59.999	27	0
00:02:00:59.999	29	0
00:02:01:59.999	32	0
00:02:02:59.999	33	0
00:02:03:59.999	36	0
00:02:04:59.999	27	0
00:02:05:59.999	23	0
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00:02:09:59.999	25	0
00:02:10:59.999	20	0
00:02:11:59.999	6	0
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00:02:54:59.999	0	0
00:02:55:59.999	13	0
00:02:56:59.999	22	0
00:02:57:59.999	22	0
00:02:58:59.999	13	0
00:02:59:59.999	54	0
00:03:00:59.999	54	0
00:03:01:59.999	35	0
00:03:02:59.999	-0	0
00:03:03:59.999	-2	0

EWD R1

⊙ CHECK

24.99 CHECK

55.52 CHECK

00:03:05:50.984	-1	0
00:03:06:50.984	12	0
00:03:07:52.984	18	0
00:03:08:53.984	13	0
00:03:09:59.984	11	0
00:03:10:59.984	19	0
00:03:11:59.984	40	0
00:03:12:59.984	43	0
00:03:13:59.984	40	0
00:03:14:59.984	32	0
00:03:15:59.983	50	0
00:03:16:59.983	43	0
00:03:17:59.983	38	0
00:03:18:59.983	46	0
00:03:19:59.983	36	0
00:03:20:59.983	47	0
00:03:21:59.983	51	0
00:03:22:59.983	46	0
00:03:23:59.983	44	0
00:03:24:59.983	39	0
00:03:25:59.983	32	0
00:03:26:59.983	38	0
00:03:27:59.982	35	0
00:03:28:59.982	38	0
00:03:29:59.982	37	0
00:03:30:59.982	34	0
00:03:31:59.982	30	0
00:03:32:59.982	38	0
00:03:33:59.982	38	0
00:03:34:59.982	27	0
00:03:35:59.982	31	0
00:03:36:59.982	31	0
00:03:37:59.982	37	0
00:03:38:59.982	32	0
00:03:39:59.981	38	0
00:03:40:59.981	39	0
00:03:41:59.981	38	0
00:03:42:59.981	35	0
00:03:43:59.981	41	0
00:03:44:59.981	35	0
00:03:45:59.981	49	0
00:03:46:59.981	40	0
00:03:47:59.981	39	0
00:03:48:59.981	36	0
00:03:49:59.981	31	0
00:03:50:59.981	39	0
00:03:51:59.980	48	0
00:03:52:59.980	39	0
00:03:53:59.980	31	0
00:03:54:59.980	31	0
00:03:55:59.980	28	0
00:03:56:59.980	27	0
00:03:57:59.980	27	0
00:03:58:59.980	30	0
00:03:59:59.980	47	0
00:04:00:59.980	47	0
00:04:01:59.980	47	0
00:04:02:59.980	39	0
00:04:03:59.979	35	0
00:04:04:59.979	31	0
00:04:05:59.979	49	0
00:04:06:59.979	51	0
00:04:07:59.979	41	0
00:04:08:59.979	41	0
00:04:09:59.979	37	0

~~START Row 2~~
START Row 2

00:04:11:59.978	46	0
00:04:12:59.978	39	0
00:04:13:59.978	35	0
00:04:14:59.978	36	0
00:04:15:59.978	37	0
00:04:16:59.978	36	0
00:04:17:59.978	37	0
00:04:18:59.978	39	0
00:04:19:59.978	57	0
00:04:20:59.978	55	0
00:04:21:59.978	44	0
00:04:22:59.978	11	0
00:04:23:59.978	-0	0
00:04:24:59.978	-4	0
00:04:25:59.978	-4	0
00:04:26:59.978	-4	0
00:04:27:59.977	12	0
00:04:28:59.977	22	0
00:04:29:59.977	22	0
00:04:30:59.977	22	0
00:04:31:59.977	53	0
00:04:32:59.977	53	0
00:04:33:59.976	11	0
00:04:34:59.976	-4	0
00:04:35:59.976	-4	0
00:04:36:59.976	-4	0
00:04:37:59.976	-4	0
00:04:38:59.976	-4	0
00:04:39:59.976	-4	0
00:04:40:59.976	-4	0
00:04:41:59.976	-4	0
00:04:42:59.976	-4	0
00:04:43:59.976	-4	0
00:04:44:59.976	-4	0
00:04:45:59.976	-4	0
00:04:46:59.976	-4	0
00:04:47:59.976	-4	0
00:04:48:59.976	-4	0
00:04:49:59.976	-4	0

END OF RUN
2

0 CHECK
24.49 CHECK

55.52 CHECK

"COORS BREWING "
"SPENT GRAIN DRYER 9"
" 8-23-1992"
"10:20:23.31"

" Time" "THC1" "

"DHMS" " ppm" " ppm"

00:00:00:00.000 0 0

00:00:00:59.999 -0 0

00:00:01:59.999 -0 0

00:00:02:59.999 27 0

00:00:03:59.999 90 0

00:00:04:59.999 69 0

00:00:05:59.999 85 0

00:00:06:59.999 86 0

00:00:07:59.999 52 0

00:00:08:59.999 58 0

00:00:09:59.999 30 0

00:00:10:59.999 27 0

00:00:11:59.999 17 0

00:00:12:59.998 1 0

00:00:13:59.998 2 0

00:00:14:59.998 2 0

00:00:15:59.998 -2 0

00:00:16:59.998 -2 0

00:00:17:59.998 3 0

00:00:18:59.998 23 0

00:00:19:59.998 76 0

00:00:20:59.998 91 0

00:00:21:59.998 95 0

00:00:22:59.998 68 0

00:00:23:59.998 79 0

00:00:24:59.997 69 0

00:00:25:59.997 71 0

00:00:26:59.997 65 0

00:00:27:59.997 66 0

00:00:28:59.997 63 0

00:00:29:59.997 64 0

00:00:30:59.997 56 0

00:00:31:59.997 53 0

00:00:32:59.997 51 0

00:00:33:59.997 53 0

00:00:34:59.997 48 0

00:00:35:59.997 44 0

00:00:36:59.997 43 0

00:00:37:59.996 45 0

00:00:38:59.996 47 0

00:00:39:59.996 44 0

00:00:40:59.996 45 0

00:00:41:59.996 46 0

00:00:42:59.996 43 0

00:00:43:59.996 40 0

00:00:44:59.996 45 0

00:00:45:59.996 41 0

00:00:46:59.996 36 0

00:00:47:59.996 39 0

00:00:48:59.995 37 0

00:00:49:59.995 35 0

00:00:50:59.995 47 0

00:00:51:59.995 54 0

00:00:52:59.995 51 0

00:00:53:59.995 41 0

00:00:54:59.995 36 0

00:00:55:59.995 36 0

00:00:56:59.995 34 0

00:00:57:59.995 34 0

00:00:58:59.995 34 0

CAL 3A
85.52 CAL
55.52 CAL
24.49 CAL

0 CAL
START
RUN 3

00:01:00:59.994	36	0
00:01:01:59.994	40	0
00:01:02:59.994	35	0
00:01:03:59.994	34	0
00:01:04:59.994	42	0
00:01:05:59.994	44	0
00:01:06:59.994	42	0
00:01:07:59.994	36	0
00:01:08:59.994	35	0
00:01:09:59.994	34	0
00:01:10:59.994	37	0
00:01:11:59.994	38	0
00:01:12:59.994	36	0
00:01:13:59.994	37	0
00:01:14:59.993	37	0
00:01:15:59.993	41	0
00:01:16:59.993	39	0
00:01:17:59.993	37	0
00:01:18:59.993	39	0
00:01:19:59.993	43	0
00:01:20:59.993	44	0
00:01:21:59.993	75	0
00:01:22:59.993	67	0
00:01:23:59.993	44	0
00:01:24:59.993	41	0
00:01:25:59.993	33	0
00:01:26:59.992	31	0
00:01:27:59.992	31	0
00:01:28:59.992	36	0
00:01:29:59.992	26	0
00:01:30:59.992	12	0
00:01:31:59.992	-0	0
00:01:32:59.992	-1	0
00:01:33:59.992	-1	0
00:01:34:59.992	-2	0
00:01:35:59.992	-1	0
00:01:36:59.992	-1	0
00:01:37:59.991	-4	0
00:01:38:59.991	-3	0
00:01:39:59.991	6	0
00:01:40:59.991	63	0
00:01:41:59.991	84	0
00:01:42:59.991	79	0
00:01:43:59.991	28	0
00:01:44:59.991	53	0
00:01:45:59.991	53	0
00:01:46:59.991	53	0
00:01:47:59.991	27	0
00:01:48:59.991	23	0
00:01:49:59.990	23	0
00:01:50:59.990	23	0
00:01:51:59.990	23	0
00:01:52:59.990	23	0
00:01:53:59.990	7	0
00:01:54:59.990	6	0
00:01:55:59.990	19	0
00:01:56:59.990	26	0
00:01:57:59.990	33	0
00:01:58:59.990	41	0
00:01:59:59.990	50	0
00:02:00:59.990	36	0
00:02:01:59.999	13	0
00:02:02:59.999	14	0
00:02:03:59.999	47	0
00:02:04:59.999	22	0
00:02:05:59.999	20	0
00:02:06:59.999	41	0
00:02:07:59.999	52	0

END RUN 3

START CAL 4

0 check

85.52 check

24.99 CAL

~~START~~

START RUN 4

00:01:00:59.909	64	0
00:01:01:59.909	73	0
00:01:02:59.909	72	0
00:01:03:59.909	64	0
00:01:04:59.909	60	0
00:01:05:59.909	58	0
00:01:06:59.909	55	0
00:01:07:59.909	53	0
00:01:08:59.909	47	0
00:01:09:59.909	45	0
00:01:10:59.909	44	0
00:01:11:59.909	39	0
00:01:12:59.909	39	0
00:01:13:59.909	38	0
00:01:14:59.909	37	0
00:01:15:59.909	35	0
00:01:16:59.909	40	0
00:01:17:59.909	46	0
00:01:18:59.909	41	0
00:01:19:59.909	44	0
00:01:20:59.909	47	0
00:01:21:59.909	44	0
00:01:22:59.909	47	0
00:01:23:59.909	46	0
00:01:24:59.909	40	0
00:01:25:59.909	38	0
00:01:26:59.909	32	0
00:01:27:59.909	31	0
00:01:28:59.909	33	0
00:01:29:59.909	43	0
00:01:30:59.909	47	0
00:01:31:59.909	36	0
00:01:32:59.909	34	0
00:01:33:59.909	41	0
00:01:34:59.909	42	0
00:01:35:59.909	35	0
00:01:36:59.909	43	0
00:01:37:59.909	42	0
00:01:38:59.909	35	0
00:01:39:59.909	33	0
00:01:40:59.909	31	0
00:01:41:59.909	34	0
00:01:42:59.909	41	0
00:01:43:59.909	35	0
00:01:44:59.909	43	0
00:01:45:59.909	42	0
00:01:46:59.909	35	0
00:01:47:59.909	33	0
00:01:48:59.909	31	0
00:01:49:59.909	34	0
00:01:50:59.909	41	0
00:01:51:59.909	35	0
00:01:52:59.909	35	0
00:01:53:59.909	43	0
00:01:54:59.909	38	0
00:01:55:59.909	34	0
00:01:56:59.909	35	0
00:01:57:59.909	33	0
00:01:58:59.909	34	0
00:01:59:59.909	35	0
00:02:00:59.909	37	0
00:02:01:59.909	37	0
00:02:02:59.909	36	0
00:02:03:59.909	40	0
00:02:04:59.909	42	0
00:02:05:59.909	42	0
00:02:06:59.909	42	0
00:02:07:59.909	44	0
00:02:08:59.909	39	0
00:02:09:59.909	8	0
00:02:10:59.909	-0	0
00:02:11:59.909	-3	0
00:02:12:59.909	-3	0
00:02:13:59.909	-3	0
00:02:14:59.909	-2	0
00:02:15:59.909	71	0

END ROAD 4

CHIEF

B.S. JR
CHECK

00:03:17:59.983	69	0
00:03:18:59.983	-1	0
00:03:19:59.983	-1	0
00:03:20:59.983	27	0
00:03:21:59.983	53	0
00:03:22:59.983	53	0
00:03:23:59.983	53	0
00:03:24:59.983	66	0
00:03:25:59.983	36	0
00:03:26:59.983	23	0
00:03:27:59.982	22	0
00:03:28:59.982	22	0
00:03:29:59.982	22	0
00:03:30:59.982	22	0
00:03:31:59.982	7	0
00:03:32:59.982	-4	0
00:03:33:59.982	-4	0
00:03:34:59.982	6	0
00:03:35:59.982	1	0
00:03:36:59.982	3	0
00:03:37:59.982	10	0
00:03:38:59.982	14	0
00:03:39:59.981	-3	0
00:03:40:59.981	-2	0
00:03:41:59.981	4	0

55.52
CHECK

24.49
CHECK

0 CHECK
268

COORS BREWING COMPANY
CAE Project No: 6362-1

FIELD DATA PRINTOUTS

COORS BREWING COMPANY
CAE Project No. 6362
August 22, 1992
Spent Grain Dryer No. 9 Outlet
10:04 AM
Pre-calibration - Run 1

Time	THC ppm
10:04 AM	0
10:05 AM	0
10:06 AM	0
10:07 AM	0
10:08 AM	0
10:09 AM	0
10:10 AM	0
10:11 AM	0
10:12 AM	0
10:13 AM	0
10:14 AM	0
10:15 AM	0
10:16 AM	0
10:17 AM	0
10:18 AM	32
10:19 AM	82
10:20 AM	82
10:21 AM	83
10:22 AM	83
10:23 AM	84
10:24 AM	84
10:25 AM	86
10:26 AM	43
10:27 AM	2
10:28 AM	2
10:29 AM	2
10:30 AM	2
10:31 AM	0
10:32 AM	0
10:33 AM	4
10:34 AM	54
10:35 AM	26
10:36 AM	3
10:37 AM	3
10:38 AM	43
10:39 AM	55
10:40 AM	44
10:41 AM	28
10:42 AM	26
10:43 AM	25
10:44 AM	25
10:45 AM	19
10:46 AM	3
10:47 AM	2
10:48 AM	2
10:49 AM	2

COORS BREWING COMPANY

CAE Project No. 6362

August 22, 1992

Spent Grain Dryer No. 9 Outlet

10:04 AM

Pre-calibration - Run 1 continued

Time	THC ppm
10:50 AM	2
10:51 AM	2
10:52 AM	2
10:53 AM	2
10:54 AM	1
10:55 AM	1
10:56 AM	1
10:57 AM	1
10:58 AM	0
10:59 AM	7
11:00 AM	17
11:01 AM	35
11:02 AM	40

COORS BREWING COMPANY

CAE Project No. 6362

August 22, 1992

Spent Grain Dryer No. 9 Outlet

11:03 AM

Run 1

Time	THC ppm
11:03 AM	32
11:04 AM	28
11:05 AM	27
11:06 AM	32
11:07 AM	28
11:08 AM	22
11:09 AM	20
11:10 AM	32
11:11 AM	28
11:12 AM	32
11:13 AM	32
11:14 AM	39
11:15 AM	32
11:16 AM	28
11:17 AM	27
11:18 AM	37
11:19 AM	27
11:20 AM	28
11:21 AM	30
11:22 AM	32
11:23 AM	25
11:24 AM	28
11:25 AM	30
11:26 AM	28
11:27 AM	26
11:28 AM	34
11:29 AM	30
11:30 AM	27
11:31 AM	30
11:32 AM	24
11:33 AM	22
11:34 AM	30
11:35 AM	33
11:36 AM	26
11:37 AM	23
11:38 AM	22
11:39 AM	32
11:40 AM	31
11:41 AM	23
11:42 AM	22
11:43 AM	21
11:44 AM	27
11:45 AM	28
11:46 AM	21
11:47 AM	22
11:48 AM	23

COORS BREWING COMPANY
CAE Project No. 6362
August 22, 1992
Spent Grain Dryer No. 9 Outlet
11:03 AM
Run 1 continued

Time	THC ppm
11:49 AM	22
11:50 AM	22
11:51 AM	21
11:52 AM	28
11:53 AM	33
11:54 AM	25
11:55 AM	24
11:56 AM	26
11:57 AM	48
11:58 AM	51
11:59 AM	39
12:00 PM	34
12:01 PM	31
12:02 PM	30
12:03 PM	29
12:04 PM	27
12:05 PM	29
12:06 PM	32
Average	29

COORS BREWING COMPANY
CAE Project No. 6362
August 22, 1992
Spent Grain Dryer No. 9 Outlet
12:07 PM
Post-calibration Run 1

Time	THC ppm
12:07 PM	39
12:08 PM	36
12:09 PM	27
12:10 PM	23
12:11 PM	25
12:12 PM	28
12:13 PM	27
12:14 PM	25
12:15 PM	20
12:16 PM	6
12:17 PM	-1
12:18 PM	-2
12:19 PM	-2
12:20 PM	-2
12:21 PM	-2
12:22 PM	-2
12:23 PM	-2
12:24 PM	6
12:25 PM	30
12:26 PM	47
12:27 PM	34
12:28 PM	32
12:29 PM	30
12:30 PM	32
12:31 PM	32
12:32 PM	35
12:33 PM	28
12:34 PM	27
12:35 PM	30
12:36 PM	37
12:37 PM	46
12:38 PM	44
12:39 PM	38
12:40 PM	63
12:41 PM	87
12:42 PM	0
12:43 PM	-2
12:44 PM	-2
12:45 PM	-2
12:46 PM	-2
12:47 PM	-2
12:48 PM	-2
12:49 PM	-2
12:50 PM	-2
12:51 PM	-2
12:52 PM	-2

COORS BREWING COMPANY

CAE Project No. 6362

August 22, 1992

Spent Grain Dryer No. 9 Outlet

12:07 PM

Post-calibration Run 1 continued

Time	THC ppm
12:53 PM	-2
12:54 PM	-2
12:55 PM	-2
12:56 PM	-2
12:57 PM	-2
12:58 PM	-2
12:59 PM	0
1:00 PM	13
1:01 PM	22
1:02 PM	22
1:03 PM	19
1:04 PM	54
1:05 PM	54
1:06 PM	35
1:07 PM	0
1:08 PM	-2
1:09 PM	4
1:10 PM	-1
1:11 PM	12
1:12 PM	18
1:13 PM	13
1:14 PM	11
1:15 PM	19

COORS BREWING COMPANY
CAE Project No. 6362
August 23, 1992
Spent Grain Dryer No. 9 Outlet
10:20 AM
Pre-calibration Run 3

Time	THC ppm
10:20 AM	0
10:21 AM	0
10:22 AM	0
10:23 AM	27
10:24 AM	90
10:25 AM	89
10:26 AM	85
10:27 AM	86
10:28 AM	52
10:29 AM	56
10:30 AM	30
10:31 AM	27
10:32 AM	17
10:33 AM	1
10:34 AM	2
10:35 AM	2
10:36 AM	-2
10:37 AM	-2
10:38 AM	3
10:39 AM	23

COORS BREWING COMPANY
CAE Project No. 6362
August 23, 1992
Spent Grain Dryer No. 9 Outlet
10:40 AM
Run 3

Time	THC ppm
10:40 AM	76
10:41 AM	91
10:42 AM	95
10:43 AM	88
10:44 AM	79
10:45 AM	69
10:46 AM	71
10:47 AM	65
10:48 AM	66
10:49 AM	63
10:50 AM	64
10:51 AM	56
10:52 AM	53
10:53 AM	51
10:54 AM	53
10:55 AM	46
10:56 AM	44
10:57 AM	43
10:58 AM	45
10:59 AM	47
11:00 AM	44
11:01 AM	45
11:02 AM	46
11:03 AM	43
11:04 AM	40
11:05 AM	45
11:06 AM	41
11:07 AM	36
11:08 AM	39
11:09 AM	37
11:10 AM	35
11:11 AM	47
11:12 AM	54
11:13 AM	51
11:14 AM	41
11:15 AM	36
11:16 AM	36
11:17 AM	34
11:18 AM	34
11:19 AM	34
11:20 AM	40
11:21 AM	38
11:22 AM	40
11:23 AM	35
11:24 AM	34
11:25 AM	42

COORS BREWING COMPANY

CAE Project No. 6362

August 23, 1992

Spent Grain Dryer No. 9 Outlet

10:40 AM

Run 3 continued

Time	THC ppm
11:26 AM	44
11:27 AM	42
11:28 AM	36
11:29 AM	35
11:30 AM	34
11:31 AM	37
11:32 AM	38
11:33 AM	36
11:34 AM	37
11:35 AM	37
11:36 AM	41
11:37 AM	39
11:38 AM	37
11:39 AM	39
11:40 AM	43
11:41 AM	44
Average	47

COORS BREWING COMPANY

CAE Project No. 6362

August 23, 1992

Spent Grain Dryer No. 9 Outlet

11:42 AM

Post-calibration Run 3

Time	THC ppm
11:42 AM	75
11:43 AM	67
11:44 AM	44
11:45 AM	41
11:46 AM	33
11:47 AM	31
11:48 AM	31
11:49 AM	36
11:50 AM	28
11:51 AM	12
11:52 AM	0
11:53 AM	-1
11:54 AM	-1
11:55 AM	-2
11:56 AM	-1
11:57 AM	-1
11:58 AM	-4
11:59 AM	-3
12:00 PM	8
12:01 PM	83
12:02 PM	84
12:03 PM	79
12:04 PM	28
12:05 PM	53
12:06 PM	53
12:07 PM	53
12:08 PM	27
12:09 PM	23
12:10 PM	23
12:11 PM	23
12:12 PM	23
12:13 PM	23
12:14 PM	7
12:15 PM	6
12:16 PM	19
12:17 PM	26
12:18 PM	33
12:19 PM	41
12:20 PM	50
12:21 PM	36
12:22 PM	13
12:23 PM	14

COORS BREWING COMPANY

CAE Project No. 6362

August 23, 1992

Spent Grain Dryer No. 9 Outlet

12:24 PM

Run 4

Time	THC ppm
12:24 PM	47
12:25 PM	22
12:26 PM	20
12:27 PM	41
12:28 PM	63
12:29 PM	64
12:30 PM	73
12:31 PM	72
12:32 PM	54
12:33 PM	60
12:34 PM	58
12:35 PM	55
12:36 PM	53
12:37 PM	47
12:38 PM	45
12:39 PM	44
12:40 PM	39
12:41 PM	39
12:42 PM	38
12:43 PM	37
12:44 PM	33
12:45 PM	40
12:46 PM	46
12:47 PM	41
12:48 PM	44
12:49 PM	47
12:50 PM	44
12:51 PM	47
12:52 PM	46
12:53 PM	40
12:54 PM	33
12:55 PM	32
12:56 PM	31
12:57 PM	33
12:58 PM	43
12:59 PM	47
1:00 PM	36
1:01 PM	34
1:02 PM	41
1:03 PM	42
1:04 PM	35
1:05 PM	43
1:06 PM	42
1:07 PM	35
1:08 PM	33
1:09 PM	31

COORS BREWING COMPANY

CAE Project No. 6362

August 23, 1992

Spent Grain Dryer No. 9 Outlet

12:24 PM

Run 4 continued

Time	THC ppm
1:10 PM	34
1:11 PM	41
1:12 PM	35
1:13 PM	35
1:14 PM	43
1:15 PM	38
1:16 PM	34
1:17 PM	35
1:18 PM	33
1:19 PM	34
1:20 PM	35
1:21 PM	37
1:22 PM	37
1:23 PM	38
1:24 PM	40
1:25 PM	42
1:26 PM	42
1:27 PM	42
1:28 PM	44
Average	42

COORS BREWING COMPANY
CAE Project No. 6362
August 23, 1992
Spent Grain Dryer No. 9 Outlet
1:29 PM
Post-calibration Run 4

Time	THC ppm
1:29 PM	39
1:30 PM	8
1:31 PM	0
1:32 PM	-3
1:33 PM	-3
1:34 PM	-3
1:35 PM	-2
1:36 PM	71
1:37 PM	83
1:38 PM	69
1:39 PM	-1
1:40 PM	-1
1:41 PM	27
1:42 PM	53
1:43 PM	53
1:44 PM	53
1:45 PM	66
1:46 PM	36
1:47 PM	23
1:48 PM	22
1:49 PM	22
1:50 PM	22
1:51 PM	22
1:52 PM	7
1:53 PM	-4
1:54 PM	-4
1:55 PM	6
1:56 PM	1
1:57 PM	3