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.

the OMEGA Group

DATE: 12-10-85

## CERTIFICATE OF CALIBRATION

CUSTOMER: ENVIRONMENTAL TESTING INC
1700 UNIV COMMERICAL PL
CHARLOTTE NC 28213

Customer Purchase Order: 2861RO
OMEGA Work Order No: SO 511268760
MODEL: MH-2
SERIAL NO: 14403

OMEGA ENGINEERING certifies that the above instrumentation has been calibrated and tested to meet or exceed the published specifications. This calibration and testing was performed using instrumentation and standards that are traceable to the U.S. National Bureau of Standards.

Reference: NATIONAL BUREAU OF STANDARDS TEST NO(s): 36320

Tony D'Inverno
Supervisor, Instrumentation

CAL-3

OMEGA ENGINEERING, INC.
OMEGA PRESS OMEGA INTERNATIONAL CORP. BIOMEGA
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# SOURCE SAMPLING REPORT

# FOR

# BLYTHE INDUSTRIES, INC.

# Gastonia, North Carolina

RECEIVED
NOV 20 1989
AIR QUALITY TECH SERVICES

Reviewed by:
ENVIRONMENTAL TESTING, INC.
Charlotte, North Carolina

Paul R. Jenkins, Jr.
October 1989

Performed by:
ENVIRONMENTAL TESTING, INC.
Charlotte, North Carolina

Richard B. McCain, III
October 1989

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B. Field Data

C. Process Data

D. Test Participants

E. Sampling and Analytical Procedures

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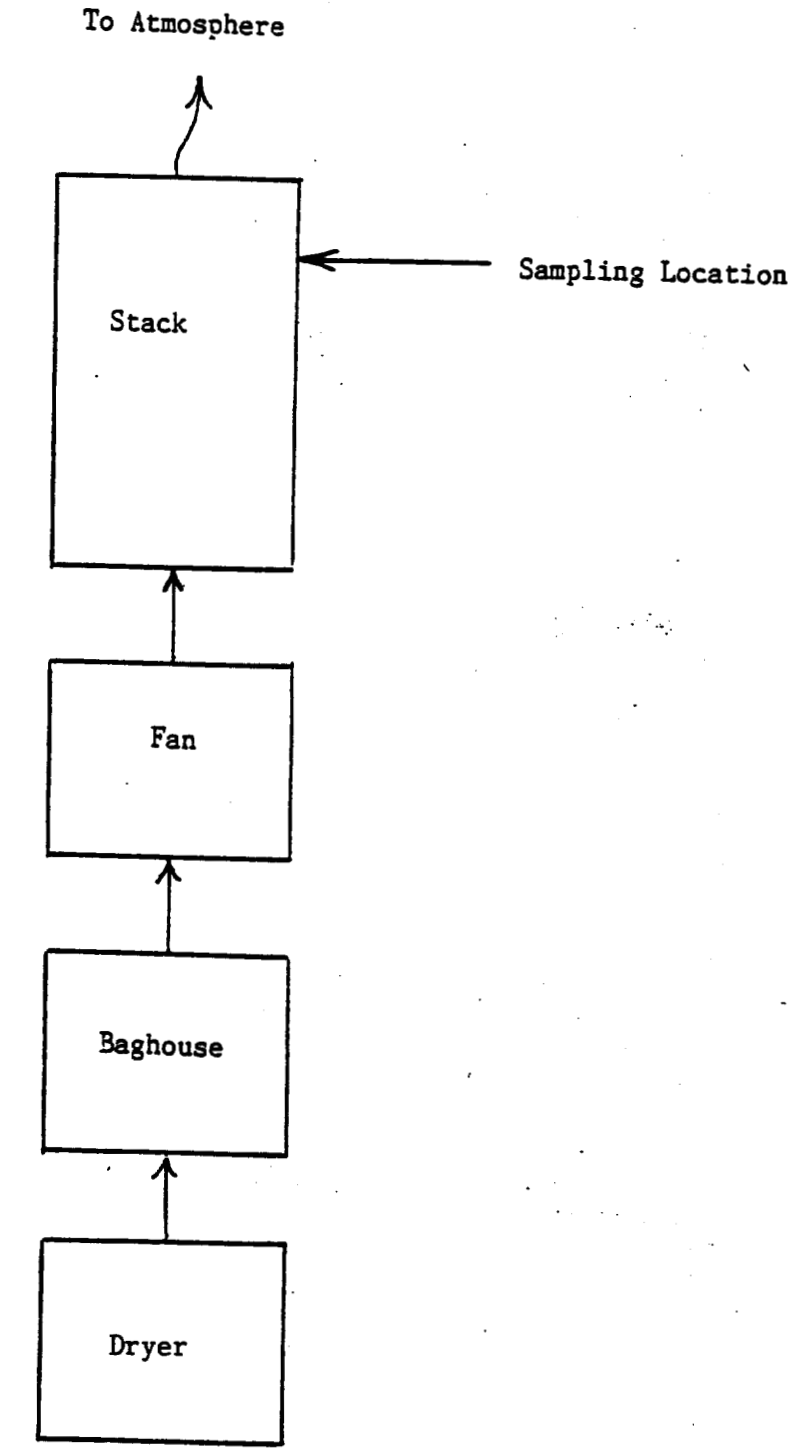
# INTRODUCTION

Source sampling was performed for Blythe Industries, Inc. Gastonia, North Carolina. The purpose of the sampling was to determine compliance with the permit limitations of 0.04 grains per dry standard cubic foot as required by the State of North Carolina. Three sampling runs were made on October 30, 1989 at the sampling locations shown on Figure 1.

The measurements of stack gas flow rate and pollutant concentrations were made according to U.S. Environmental Protection Agency and the North Carolina Department of Natural Resources and Community Development (DNRCD) recommendations. Mr. Mike Landis, N.C. DNRCD, was present to observe the test.

The following sections of the report treat the summary of results, the process and its operation, the location of the sampling points and the sampling and analytical procedures used.




FLOW DIAGRAM

Figure 1

## SUMMARY OF RESULTS

Table 1 presents the summary of results from the particulate sampling. The mean particulate concentration was 0.0222 grains per dry standard cubic foot and the mean particulate emission rate was 3.669 pounds per hour. The average process weight was approximately 240 tons per hour.

There were visual emissions observed during the sampling runs, however, all visual emissions noted were recorded as less than 20%. The field data sheets and summary sheets detailing the opacity readings can be found in Appendix B.

Based on the results of the particulate sampling and the visual emission observations the Blythe Industries, Inc., Gastonia, North Carolina asphalt plant was in compliance with the regulations of the State of North Carolina which allowed for an emission rate of 0.04 grains per dry standard cubic foot.

## TABLE 1

## SUMMARY OF RESULTS, PARTICULATE SAMPLING

| Run Number | 1 | 2 | 3 |
|---|---|---|---|
| Date | 10/30/89 | 10/30/89 | 10/30/89 |
| % Isokinetic | 109.98 | 108.14 | 108.58 |
| Volume of Gas Sampled, SCF * Dry | 45.142 | 47.051 | 45.825 |
| Stack Gas Flow Rate, SCFM * Dry | 18820.6 | 19635.3 | 19352.4 |
| Stack Gas Flow Rate, ACFM | 37402.8 | 38792.5 | 38171.9 |
| Particulate: | | | |
| Catch, mgrams | 70.13 | 63.17 | 65.82 |
| Concentration, grains/ SCF * Dry | 0.0239 | 0.0207 | 0.0221 |
| Emission Rate, lbs/hr | 3.859 | 3.479 | 3.669 |

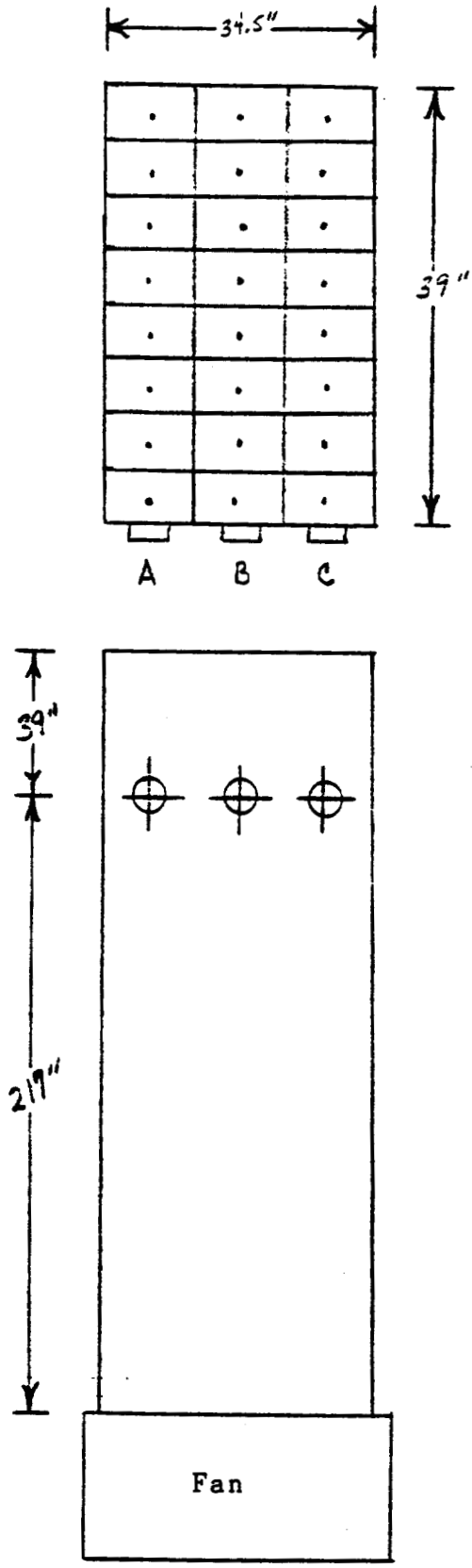
*68°F, 29.92 in. Hg
**Nozzle, probe, filter

## PROCESS DESCRIPTION AND OPERATION

The Blythe Industries, Inc. asphalt plant in Gastonia, North Carolina is a Aztec continuous drum type plant. It produces hot mix asphalt made from asphalt cement, sand, granite screenings and granite aggregates. The materials are dried in a rotary dryer fired with No. 2 fuel oil. The material mix was conveyed to a storage silo. Air was introduced at the burner and passed through the dryer, baghouse, fan and stack to the atmosphere. The plant was rated at 250 tons per hour.

## LOCATION OF SAMPLING POINTS

The dimensions of the stack and the location of the sampling points are shown in Figure 2. The stack cross section was divided into 24 equal areas. The ports were labeled A, B and C. Each point was sampled for a period of 2.5 minutes per point which yielded a total test time of 60 minutes per run. The number of sampling points was determined by the distance from the last disturbance in the gas flow as outlined in Method 1, Federal Register, Volume 48, No. 191, 30 September 1983.




De = 36.6

Figure 2

## SAMPLING AND ANALYTICAL PROCEDURES

All sampling and analytical procedures used were those recommended by the U.S. Environmental Protection Agency and the N.C. DNRCD. Complete details are found in Appendix E which is a copy of the Federal Register, Volume 42, Number 160, dated 18 August 1977, the Federal Register, Volume 48, No. 191, 30 September 1983 (Methods 1 - 5), and 40 CFR Chapter 1, Part 60, Appendix A, dated 01 July 1986 (Method 9).

Sample point locations and velocity measurements were made by Methods 1 and 2. Gas composition was determined by Fyrite and Method 3 on continuous bag samples. Method 5 was used for the particulate determination. Method 9 was used for the visual emission determinations.

# APPENDICES

APPENDIX A

# SUMMARY OF RESULTS

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Summary of Method 5 Particulate Results

Blythe Industries Inc. Gastonia NC Baghouse Stack

| Run Number | | 1 | 2 | 3 |
|---|---|---|---|---|
| Date | | 10/30/89 | 10/30/89 | 10/30/89 |
| DN | Sample nozzle dia., in. | 0.250 | 0.252 | 0.250 |
| TT | Net time of test | 60 | 60 | 60 |
| PB | Barometric pressure, in. Hg. | 29.34 | 29.34 | 29.34 |
| PM | Average orifice pressure drop, in. H2O | 2.190 | 2.381 | 2.285 |
| VM | Volume of dry gas sampled, cu. ft. at meter conditions | 48.06 | 50.79 | 49.95 |
| TM | Average gas meter temp. in degrees F. | 94.04 | 102.02 | 107.38 |
| VMSTD | Volume of dry gas sampled at standard conditions*, SCF | 45.142 | 47.051 | 45.825 |
| VW | Total water collected in impingers + silica gel, ML. | 355.5 | 364.0 | 354.0 |
| VMV | Volume of water vapor at standard conditions*, SCF | 16.740 | 17.141 | 16.670 |
| PMV | Percent moisture by volume | 27.052 | 26.702 | 26.674 |
| MD | Mole fraction dry gas | 0.7295 | 0.7330 | 0.7333 |
| PCO2 | Percent CO2 by volume, dry | 4.00 | 6.50 | 3.50 |
| PO2 | Percent O2 by volume, dry | 12.50 | 12.00 | 10.00 |
| PCO | Percent CO by volume, dry | 0.00 | 0.00 | 0.00 |
| PN2 | Percent N2 by volume, dry | 83.50 | 81.50 | 86.50 |
| MWD | Molecular weight-dry stack gas | 29.140 | 29.520 | 28.960 |
| MW | Molecular weight-stack gas | 26.126 | 26.444 | 26.037 |
| CP | Pitot tube coefficient | 0.84 | 0.84 | 0.84 |
| DPS | Average velocity head of stack gas, inches water | 0.9352 | 0.9764 | 0.9539 |
| TS | Average stack temperature, F | 289.08 | 288.25 | 287.33 |

| | | | | |
|---|---|---|---|---|
| PSI | Static pressure of stack gas, inches Hg. | -0.048 | -0.048 | -0.048 |
| PS | Stack pressure, absolute | 29.292 | 29.292 | 29.292 |
| VS | Average stack velocity, FPM | 3986.7 | 4134.8 | 4068.7 |
| AS | Stack area, inches sqrd. | 1345.5 | 1345.5 | 1345.5 |
| QS | Stack flow rate, dry, standard conditions, DSCFM | 18820.6 | 19635.3 | 19352.4 |
| QSW | Stack flow rate, wet, standard conditions, WSCFM | 25800.1 | 26788.5 | 26392.3 |
| QA | Actual stack flow rate, ACFM | 37402.8 | 38792.5 | 38171.9 |
| PERI | Percent isokinetic | 109.98 | 108.14 | 108.58 |
| FMF | Particulate, Mg., front | 70.13 | 63.17 | 65.82 |
| CAN | Particulate, GR/DSCF front | 0.0239 | 0.0207 | 0.0221 |
| CAM | Particulate, GR/WSCF front | 0.0328 | 0.0282 | 0.0302 |
| CAT | Particulate, GR/ACF front | 0.0120 | 0.0105 | 0.0112 |
| CAW | Particulate, LB/HR front | 3.859 | 3.479 | 3.669 |
| FNP | Net sampling points | 24 | 24 | 24 |
| RW | Process weight, tons/hr | 240.0 | 240.0 | 240.0 |

Average 0.0222

*68 Degrees F. 29.92 Inches Hg.

environmental testing inc.

Method 5 Particulate Calculations Test Number 1

Blythe Industries Inc. Gastonia NC Baghouse Stack

Volume of Dry Gas Sampled at Standard Conditions

$$VMSTD = \frac{17.64 * VM * (PB + PM / 13.6)}{TM + 460} = 45.142$$

Volume of Water Vapor at Standard Conditions

VMV = 0.04709 * VW = 16.740

Percent Moisture in Stack Gas

$$PMV = \frac{100 * VMV}{VMSTD + VMV} = 27.052$$

Mole Fraction of Dry Gas

$$MD = \frac{100 - PMV}{100} = 0.7295$$

Average Molecular Weight of Dry Stack Gas

MWD = 0.44 * PCO2 + 0.32 * PO2 + 0.28 * (PN2+PCO) = 29.140

Molecular Weight of Stack Gas

MW = MWD * MD +18 * (1-MD) = 26.126

Stack Gas Velocity at Stack Conditions

VS = 5129.4 * CP * DPS * SQRT(TS + 460)/(PS * MW) = 3986.7

Stack Gas Volumetric Flow at Standard Conditions, Dry

$$QS = \frac{0.123 * VS * AS * PS * MD}{TS + 460} = 18820.6$$

Stack Gas Volumetric Flow at Stack Conditions

$$QA = \frac{QS * (TS + 460)}{17.64 * PS * MD} = 37402.8$$

Percent Isokinetic

$$PERI = \frac{1039 * (TS + 460) * VMSTD}{VS * TT * PS * MD * DN * DN} = 109.98$$

Particulate Loading -- Probe, Cyclone, Filter
( At Standard Conditions )
CAN = 0.0154 * FMF / VMSTD = 0.0239

Particulate Loading -- Probe, Cyclone, Filter
( At Stack Conditions )

$$CAT = \frac{17.64 * CAN * PS * MD}{TS + 460} = 0.0120$$

Particulate Lb/Hr -- Probe, Cyclone, Filter
( At Standard Conditions )
CAW = 0.00857 * CAN * QS = 3.859

APPENDIX B

# FIELD DATA

# TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

Plant Blythe Industries, Gastonia NC

Date Oct. 30, 1989

Sampling location Baghouse Stack

Inside of far wall to outside of nipple (X) 42"

Inside of near wall to outside of nipple (nipple length) (X) 3"

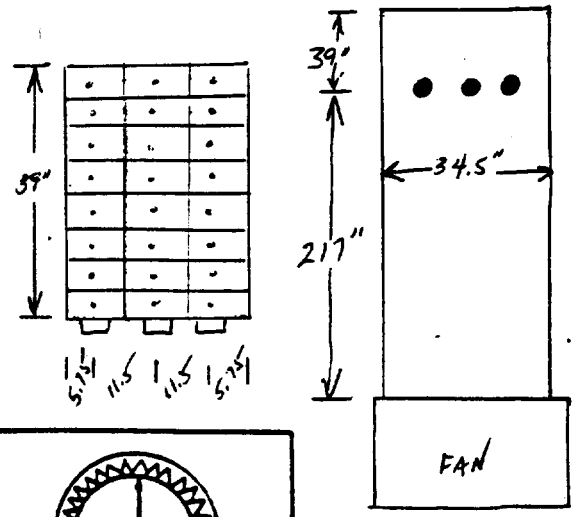
Stack I.D. (X-Y) 34.5" x 39"

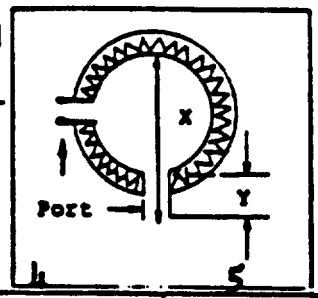
Nearest upstream disturbance 1.07 dd

Nearest downstream disturbance 5.93 dd

Calculated by RBM

Eq Diameter 36.6"




SCHEMATIC OF SAMPLING LOCATION

| 1 | 2 | 3 | | | |
|---|---|---|---|---|---|
| TRAVERSE POINT NUMBER | FRACTION OF STACK I D | STACK I D | PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH) | NIPPLE LENGTH | TRAVERSE POINT LOCATION FROM OUTSIDE OF NIPPLE (SUM OF COLUMNS 4 & 5) |
| 1 | 0.0625 | 39" | 2.438 | 3" | 5.438 |
| 2 | 0.1875 | \| | 7.313 | \| | 10.313 |
| 3 | 0.3125 | \| | 12.188 | \| | 15.188 |
| 4 | 0.4375 | \| | 17.063 | \| | 20.063 |
| 5 | 0.5625 | \| | 21.938 | \| | 24.938 |
| 6 | 0.6875 | \| | 26.813 | \| | 29.813 |
| 7 | 0.8125 | \| | 31.688 | \| | 34.688 |
| 8 | 0.9375 | 39" | 36.563 | 3" | 39.563 |
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# METHOD 2 GAS VELOCITY AND CYCLONIC FLOW DETERMINATION

Plant and City Blythe Industries, Gastonia NC Run Date 10/30/89

Sampling Location Baghouse Stack Clock Time 0800

Run Number 1 Operator RBM/WAB Amb. Temp., °F 64

Bar. Press., in. Hg 29.34 Static Press., in. $H_2O$ -0.65

Stack Press., in. Hg 29.292 Static Press., in. Hg -0.048

Stack Dimension, in. - Diam. or side 1 34.5 side 2 39

Pitot Tube ($C_p$) 0.84 Pitot Tube Leak Check <0.1 @ 4.2 in. $H_2O$

Field data — No Cyclonic Flow in Rect. Duct

| Traverse point number | Position, in. A | Velocity head ($\Delta p_s$), in. $H_2O$ A | B | C | Stack temp., °F A | B | C | Cyclonic flow determination: $\Delta p_s$ at 0° reference | | Angle (α) which yields a null Δp | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.435 | 0.78 | 0.82 | 0.86 | 287 | 289 | 291 | | | | |
| 2 | 10.313 | 1.10 | 1.10 | 1.10 | 287 | 289 | 291 | | | | |
| 3 | 15.188 | 1.15 | 1.10 | 1.00 | 287 | 289 | 291 | | | | |
| 4 | 20.063 | 1.10 | 1.00 | 0.85 | 287 | 289 | 291 | | | | |
| 5 | 24.938 | 1.10 | 1.00 | 0.60 | 287 | 289 | 291 | | | | |
| 6 | 29.813 | 1.05 | 0.95 | 0.58 | 287 | 289 | 291 | | | | |
| 7 | 34.688 | 0.98 | 0.90 | 0.65 | 287 | 289 | 291 | | | | |
| 8 | 39.563 | 1.00 | 0.90 | 0.60 | 287 | 289 | 291 | | | | |

Average angle (α)[a]

[a] Average of (α) must be < 10 degrees to be acceptable.

## NOMAGRAPH DATA

$\Delta H_@$ 1.81 $T_m$ 100 %M 18% $P_s/P_m$ 0.999 C 0.83 $D_b$ 287

$\overline{\Delta p}$ 0.93 $T_s$ 290 $DN_c$ 0.235 $DN_a$ 0.250 0.252 0.250 Ref. Δp 0.75 $W_b$ 145 D/ 142

# METHOD 5 PARTICULATE FIELD DATA

Plant: Blythe Industries, Gastonia
Run No.: 1
Location: Baghouse Stack
Date: 10/30/89
Operator: RAM / WAB
Sample Box No.: 1
Meter Box No.: 1348
Filter No.: 75
Probe No.:
Pitot Tube Cp: 0.84

Very Important — Fill In All Blanks
Leak Checks: Beg. @ 15" 0.004
End @ 10" 0.004
Pitot Tube: Pretest @ 4.5 "$H_2O$
Posttest @ 3.9 "$H_2O$
Static Pressure: -0.65 "$H_2O$
Start: 0845
Finish: 0949
Observer: Mike Landis Agency: N.C. DNRCD

Bar. Press. "Hg: 29.34
Meter Box ΔH@: 1.81 Y = 1.00
Assumed Tm, °F: 100
Dry Bulb, °F: 287
Wet Bulb, °F: 145
Db - Wb, °F: 142
Assumed Moisture %: 18%
Ps/Pm: 0.999
C Factor: 0.83

Ambient Temp., °F: 65
Heater Box Setting, °F: 250
Probe Tip Dia., in.: 0.250
Probe Length: 4' glass lined
Probe Heater Setting: 85%
Average Δp: 0.93 Δp: 0.75
Average ΔH: 2.30 ΔH: Ref
Process Weight: 240 tons / hr
Steam Load: —
Steam Pressure: —

| Point | Clock Time | Dry Gas Meter, Cu. Ft. | Pitot Manometer (Δp) in $H_2O$ | Orifice Manometer (ΔH) in $H_2O$ Desired | Orifice Manometer (ΔH) in $H_2O$ Actual | Dry Gas Temp. °F Inlet | Dry Gas Temp. °F Outlet | Pump Vacuum in Hg Gauge | Box Temp. °F | Impinger Temp. °F | Stack Temp. °F | % $CO_2$ | % $O_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 0 | 962.30 | 0.90 | 2.21 | 2.21 | 66 | 66 | 7.0 | 235 | 52 | 285 | | |
| 2 | 2½ | 964.29 | 0.90 | 2.21 | 2.21 | 74 | 77 | 7.0 | 235 | 50 | 286 | | |
| 3 | 5 | 966.27 | 0.98 | 2.45 | 2.45 | 80 | 78 | 8.5 | 245 | 52 | 287 | | |
| 4 | 7½ | 968.39 | 1.05 | 2.60 | 2.60 | 88 | 78 | 9.5 | 255 | 52 | 288 | | |
| 5 | 10 | 970.46 | 1.05 | 2.60 | 2.60 | 94 | 79 | 9.5 | 260 | 54 | 288 | | |
| 6 | 12½ | 972.57 | 1.00 | 2.49 | 2.49 | 100 | 80 | 9.3 | 260 | 56 | 289 | | |
| 7 | 15 | 974.69 | 0.90 | 2.21 | 2.21 | 103 | 78 | 7.5 | 255 | 57 | 290 | | |
| 8 | 17½ | 976.72 | 0.87 | 2.19 | 2.19 | 106 | 78 | 7.5 | 260 | 58 | 290 | | |
| B1 | 20/0 | 978.75 | 1.05 | 2.60 | 2.60 | 98 | 73 | 9.5 | 260 | 54 | 289 | | |
| 2 | 2½ | 980.92 | 0.93 | 2.30 | 2.30 | 104 | 76 | 8.0 | 265 | 57 | 290 | | |
| 3 | 5 | 983.01 | 1.00 | 2.49 | 2.49 | 108 | 78 | 9.4 | 265 | 59 | 290 | | |
| 4 | 7½ | 985.12 | 1.05 | 2.60 | 2.60 | 111 | 80 | 9.8 | 260 | 59 | 290 | | |
| 5 | 10 | 987.28 | 1.05 | 2.60 | 2.60 | 113 | 80 | 9.8 | 260 | 59 | 291 | | |
| 6 | 12½ | 989.49 | 1.00 | 2.49 | 2.49 | 116 | 82 | 9.5 | 260 | 58 | 293 | | |
| 7 | 15 | 991.64 | 0.98 | 2.45 | 2.45 | 118 | 83 | 9.3 | 260 | 59 | 292 | | |
| 8 | 17½ | 993.71 | 0.90 | 2.21 | 2.21 | 120 | 85 | 8.0 | 260 | 60 | 292 | | |
| C1 | 20/0 | 995.79 | 0.82 | 2.02 | 2.02 | 117 | 86 | 7.5 | 260 | 58 | 290 | | |
| 2 | 2½ | 997.75 | 0.93 | 2.30 | 2.30 | 118 | 87 | 8.3 | 260 | 58 | 291 | | |
| 3 | 5 | 999.82 | 0.80 | 1.96 | 1.96 | 120 | 88 | 7.2 | 255 | 59 | 289 | | |
| 4 | 7½ | 1001.77 | 0.71 | 1.80 | 1.80 | 121 | 89 | 6.5 | 250 | 59 | 288 | | |
| 5 | 10 | 1003.60 | 0.65 | 1.62 | 1.62 | 120 | 90 | 6.3 | 245 | 59 | 287 | | |
| 6 | 12½ | 1005.42 | 0.60 | 1.49 | 1.49 | 119 | 90 | 6.0 | 245 | 59 | 288 | | |
| 7 | 15 | 1007.11 | 0.56 | 1.41 | 1.41 | 119 | 90 | 5.8 | 240 | 59 | 288 | | |
| 8 | 17½ | 1008.78 | 0.51 | 1.27 | 1.27 | 119 | 91 | 5.5 | 240 | 60 | 287 | | |
| | 20 | 1010.36 | | | | | | | | | | | |
| | | | | | | | | | | | | | |

48.06 ✓ 2.16 OK

# METHOD 5 PARTICULATE FIELD DATA

Plant: Blythe Industries, Gastonia NC
Run No.: 2
Location: Baghouse Stack
Date: 10/30/89
Operator: RBM/WQB
Sample Box No.: 2
Meter Box No.: 1348
Filter No.: 26
Probe No.: 2
Pitot Tube Cp: 0.84

Very Important — Fill In All Blanks
Leak Checks: Beg. @ 15" 0.009
End @ 10" 0.013
Pitot Tube: Pretest @ 4.7 "$H_2O$
Posttest @ 3.6 "$H_2O$
Static Pressure: -0.65 "$H_2O$
Start: 1015
Finish: 1118
Observer: Mike Landis Agency: N.C. DNRCD

Bar. Press. "Hg: 29.34
Meter Box ΔH@: 1.81 Y = 1.00
Assumed Tm, °F: 100
Dry Bulb, °F: 287
Wet Bulb, °F: 145
Db - Wb, °F: 142
Assumed Moisture %: 18%
Ps/Pm: 0.999
C Factor: 0.83

Ambient Temp., °F: 68
Heater Box Setting, °F: 250
Probe Tip Dia., in.: 0.252
Probe Length: 4' glass lined
Probe Heater Setting: 85%
Average Δp: 0.93 Δp: 0.75
Average ΔH: 2.30 ΔH: Ref
Process Weight: 240 tons/hr
Steam Load: —
Steam Pressure: —

| Point | Clock Time | Dry Gas Meter, Cu. Ft. | Pitot Manometer (Δp) in $H_2O$ | Orifice Manometer (ΔH) in $H_2O$ Desired | Orifice Manometer (ΔH) in $H_2O$ Actual | Dry Gas Temp. °F Inlet | Dry Gas Temp. °F Outlet | Pump Vacuum in Hg Gauge | Box Temp. °F | Impinger Temp. °F | Stack Temp. °F | % $CO_2$ | % $O_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 0 | 10.64 | 1.05 | 2.60 | 2.60 | 86 | 86 | 8.5 | 230 | 54 | 287 | | |
| 2 | 2½ | 12.81 | 1.00 | 2.49 | 2.49 | 87 | 87 | 8.5 | 230 | 55 | 288 | | |
| 3 | 5 | 14.94 | 1.00 | 2.49 | 2.49 | 96 | 88 | 8.5 | 230 | 55 | 287 | | |
| 4 | 7½ | 17.02 | 1.05 | 2.60 | 2.60 | 103 | 89 | 9.5 | 230 | 55 | 288 | | |
| 5 | 10 | 19.18 | 1.05 | 2.60 | 2.60 | 107 | 90 | 9.5 | 235 | 57 | 289 | | |
| 6 | 12½ | 21.31 | 0.98 | 2.45 | 2.45 | 111 | 89 | 8.3 | 235 | 58 | 289 | | |
| 7 | 15 | 23.53 | 0.95 | 2.38 | 2.38 | 114 | 90 | 8.0 | 240 | 58 | 290 | | |
| 8 | 17½ | 25.69 | 0.90 | 2.21 | 2.21 | 116 | 90 | 7.8 | 240 | 59 | 289 | | |
| B1 | 20/0 | 27.78 | 1.00 | 2.49 | 2.49 | 111 | 90 | 8.8 | 240 | 59 | 287 | | |
| 2 | 2½ | 29.94 | 0.98 | 2.45 | 2.45 | 114 | 91 | 8.4 | 245 | 59 | 288 | | |
| 3 | 5 | 32.05 | 1.00 | 2.49 | 2.49 | 116 | 92 | 8.8 | 245 | 57 | 290 | | |
| 4 | 7½ | 34.17 | 1.10 | 2.70 | 2.70 | 116 | 92 | 10.0 | 240 | 56 | 290 | | |
| 5 | 10 | 36.42 | 1.05 | 2.60 | 2.60 | 117 | 92 | 9.8 | 240 | 53 | 289 | | |
| 6 | 12½ | 38.65 | 0.95 | 2.38 | 2.38 | 117 | 93 | 8.5 | 240 | 53 | 287 | | |
| 7 | 15 | 40.72 | 0.93 | 2.30 | 2.30 | 117 | 93 | 8.2 | 240 | 54 | 286 | | |
| 8 | 17½ | 42.87 | 0.93 | 2.30 | 2.30 | 117 | 93 | 8.2 | 240 | 56 | 288 | | |
| C1 | 20/0 | 44.95 | 1.00 | 2.49 | 2.49 | 114 | 94 | 9.0 | 240 | 53 | 289 | | |
| 2 | 2½ | 46.99 | 1.00 | 2.49 | 2.49 | 117 | 96 | 9.2 | 240 | 56 | 287 | | |
| 3 | 5 | 49.36 | 1.05 | 2.60 | 2.60 | 118 | 96 | 10.0 | 240 | 57 | 290 | | |
| 4 | 7½ | 51.44 | 0.95 | 2.38 | 2.38 | 119 | 96 | 9.5 | 240 | 58 | 287 | | |
| 5 | 10 | 53.59 | 0.83 | 2.10 | 2.10 | 118 | 96 | 9.0 | 240 | 59 | 288 | | |
| 6 | 12½ | 55.63 | 0.76 | 1.90 | 1.90 | 118 | 96 | 8.0 | 240 | 59 | 289 | | |
| 7 | 15 | 57.61 | 0.71 | 1.80 | 1.80 | 118 | 96 | 7.8 | 240 | 59 | 289 | | |
| 8 | 17½ | 59.52 | 0.73 | 1.85 | 1.85 | 119 | 96 | 7.8 | 235 | 61 | 287 | | |
| | 20 | 61.43 | | | | | | | | | | | |
| | | | | | | | | | | | | | |

59.29 2.38 102

# METHOD 5 PARTICULATE FIELD DATA

Plant: Blythe Industries, Gastonia NC
Run No.: 3
Location: Baghouse Stack
Date: 10/20/89
Operator: RBM / WAB
Sample Box No.: 3
Meter Box No.: 1348
Filter No.: 27
Probe No.: 3
Pitot Tube Cp: 0.84

Very Important — Fill In All Blanks
Leak Checks: Beg. @ 15": 0.008
End @ 11": 0.007
Pitot Tube: Prefest @ 4.5 "$H_2O$
Post test @ 4.8 "$H_2O$
Static Pressure: -0.65 "$H_2O$
Start: 1150
Finish: 1253
Observer: Mike Landis Agency: N.C. DNRCD

Bar. Press. "Hg: 29.34
Meter Box ΔH@: 1.81 Y = 1.00
Assumed Tm, °F: 100
Dry Bulb, °F: 207
Wet Bulb, °F: 145
Db - Wb, °F: 142
Assumed Moisture %: 18%
Ps/Pm: 0.999
C Factor: 0.83

Ambient Temp., °F: 72
Heater Box Setting, °F: 250
Probe Tip Dia., in.: 0.250
Probe Length: 4' glass lined
Probe Heater Setting: 85%
Average Δp: 0.93 Δp: 0.75
Average ΔH: 2.30 ΔH Rel
Process Weight: 240 tons/hr
Steam Load: —
Steam Pressure: —

| Point | Clock Time | Dry Gas Meter, Cu. Ft. | Pitot Manometer (Δp) in $H_2O$ | Orifice Manometer (ΔH) in $H_2O$ Desired | Orifice Manometer (ΔH) in $H_2O$ Actual | Dry Gas Temp. °F Inlet | Dry Gas Temp. °F Outlet | Pump Vacuum in Hg Gauge | Box Temp. °F | Impinger Temp. °F | Stack Temp. °F | % $CO_2$ | % $O_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 0 | 62.60 | 1.05 | 2.60 | 2.60 | 92 | 91 | 10.0 | 225 | 55 | 285 | | |
| 2 | 2½ | 64.75 | 1.05 | 2.60 | 2.60 | 98 | 92 | 10.0 | 225 | 53 | 289 | | |
| 3 | 5 | 66.91 | 1.00 | 2.49 | 2.49 | 106 | 92 | 9.8 | 230 | 52 | 289 | | |
| 4 | 7½ | 69.09 | 0.95 | 2.38 | 2.38 | 111 | 93 | 9.8 | 235 | 53 | 290 | | |
| 5 | 10 | 71.23 | 0.98 | 2.45 | 2.45 | 114 | 93 | 10.0 | 240 | 54 | 288 | | |
| 6 | 12½ | 73.39 | 1.00 | 2.49 | 2.49 | 118 | 93 | 10.0 | 245 | 55 | 289 | | |
| 7 | 15 | 75.55 | 0.90 | 2.21 | 2.21 | 121 | 94 | 9.5 | 245 | 55 | 289 | | |
| 8 | 17½ | 77.61 | 0.90 | 2.21 | 2.21 | 123 | 94 | 9.5 | 240 | 58 | 287 | | |
| B1 | 20/0 | 79.70 | 1.05 | 2.60 | 2.60 | 112 | 94 | 10.0 | 240 | 56 | 288 | | |
| 2 | 2½ | 82.00 | 1.05 | 2.60 | 2.60 | 115 | 95 | 10.0 | 245 | 57 | 288 | | |
| 3 | 5 | 84.21 | 1.00 | 2.49 | 2.49 | 118 | 96 | 9.8 | 245 | 58 | 289 | | |
| 4 | 7½ | 86.26 | 1.00 | 2.49 | 2.49 | 119 | 97 | 9.8 | 250 | 58 | 288 | | |
| 5 | 10 | 88.41 | 1.05 | 2.60 | 2.60 | 120 | 97 | 10.0 | 250 | 58 | 288 | | |
| 6 | 12½ | 90.67 | 1.00 | 2.49 | 2.49 | 120 | 97 | 9.8 | 250 | 59 | 288 | | |
| 7 | 15 | 92.91 | 0.98 | 2.45 | 2.45 | 121 | 97 | 9.8 | 250 | 59 | 287 | | |
| 8 | 17½ | 95.17 | 0.95 | 2.38 | 2.38 | 121 | 98 | 9.8 | 250 | 59 | 287 | | |
| C1 | 20/0 | 97.14 | 0.95 | 2.38 | 2.38 | 120 | 99 | 10.0 | 255 | 60 | 288 | | |
| 2 | 2½ | 99.13 | 0.98 | 2.45 | 2.45 | 123 | 100 | 10.2 | 255 | 60 | 289 | | |
| 3 | 5 | 101.21 | 0.85 | 2.15 | 2.15 | 125 | 100 | 9.5 | 255 | 60 | 287 | | |
| 4 | 7½ | 103.41 | 0.83 | 2.10 | 2.10 | 126 | 100 | 9.3 | 255 | 60 | 286 | | |
| 5 | 10 | 105.42 | 0.70 | 1.77 | 1.77 | 127 | 101 | 9.0 | 250 | 60 | 285 | | |
| 6 | 12½ | 107.32 | 0.63 | 1.60 | 1.60 | 128 | 101 | 8.5 | 250 | 59 | 283 | | |
| 7 | 15 | 109.11 | 0.60 | 1.49 | 1.49 | 129 | 101 | 8.0 | 250 | 59 | 284 | | |
| 8 | 17½ | 110.92 | 0.55 | 1.38 | 1.38 | 130 | 102 | 7.5 | 250 | 69 | 285 | | |
| | 20 | 112.55 | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | 49.95 | | | | 285 | | 107.5 | | | | | |

environmental testing inc.

# METHOD 3 - ORSAT AND DRY MOLECULAR WEIGHT DETERMINATION

Plant Blythe Industries, Gastonia, NC Sample Location Baghouse stack

Sample Type - Continuous ✓ Pump Leakfree @ 10" ? ✓

Oxygen Check 20.9% ± 0.1% ✓ Fuel Type No. 2 Fuel Oil

Orsat Leak Check @ 4 min.: Pipet Levels - Leakfree ? ✓

Buret 20.9 - 20.9 = <0.2 ml ? ✓

Run No. 1 Sample Date 10/30/89 Ambient Temp. °F 73

Sampling Time (24 - hr clock) 0945-0949 Analysis By RBM

| Gas \ Run | 1 Actual | 1 Net | 2 Actual | 2 Net | 3 Actual | 3 Net | Avg. % | Mult. | Molecular Wt. Dry lb/lb mole |
|---|---|---|---|---|---|---|---|---|---|
| $CO_2$ | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | .44 | 1.760 |
| $O_2$ | 16.5 | 12.5 | 16.5 | 12.5 | 16.5 | 12.5 | 12.5 | .32 | 4.000 |
| CO | 16.5 | 0.0 | 16.5 | 0.0 | 16.5 | 0.0 | 0.0 | .28 | 0.000 |
| $N_2$ | 100 | 83.5 | 100 | 83.5 | 100 | 83.5 | 83.5 | .28 | 23.380 |
| | | | | | | | | Total | 29.140 |

$F_o = \frac{20.9 - \%O_2}{\%CO_2}$ = NA

Run No. 2 Sample Date 10/30/89 Ambient Temp. °F 73

Sampling Time (24 - hr clock) 1015-1118 Analysis By RBM

| Gas \ Run | 1 Actual | 1 Net | 2 Actual | 2 Net | 3 Actual | 3 Net | Avg. % | Mult. | Molecular Wt. Dry lb/lb mole |
|---|---|---|---|---|---|---|---|---|---|
| $CO_2$ | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | .44 | 2.860 |
| $O_2$ | 18.5 | 12.0 | 18.5 | 12.0 | 18.5 | 12.0 | 12.0 | .32 | 3.840 |
| CO | 18.5 | 0.0 | 18.5 | 0.0 | 18.5 | 0.0 | 0.0 | .28 | 0.000 |
| $N_2$ | 100 | 81.5 | 100 | 81.5 | 100 | 81.5 | 81.5 | .28 | 22.820 |
| | | | | | | | | Total | 29.520 |

$F_o = \frac{20.9 - \%O_2}{\%CO_2}$ = NA

Run No. 3 Sample Date 10/30/89 Ambient Temp. °F 73

Sampling Time (24 - hr clock) 1150-1253 Analysis By RBM

| Gas \ Run | 1 Actual | 1 Net | 2 Actual | 2 Net | 3 Actual | 3 Net | Avg. % | Mult. | Molecular Wt. Dry lb/lb mole |
|---|---|---|---|---|---|---|---|---|---|
| $CO_2$ | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | .44 | 1.540 |
| $O_2$ | 13.5 | 10.0 | 13.5 | 10.0 | 13.5 | 10.0 | 10.0 | .32 | 3.200 |
| CO | 13.5 | 0.0 | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | .28 | 0.000 |
| $N_2$ | 100 | 86.5 | 100 | 86.5 | 100 | 86.5 | 86.5 | .28 | 24.220 |
| | | | | | | | | Total | 28.960 |

| Fuel type | $F_o$ range |
|---|---|
| Coal: | |
| Anthracite and lignite | 1.016-1.130 |
| Bituminous | 1.083-1.230 |
| Wood | 1.000-1.120 |
| Wood bark | 1.003-1.130 |

$F_o = \frac{20.9 - \%O_2}{\%CO_2}$ = NA

environmental testing inc.

# METHOD 5 SAMPLE RECOVERY AND INTEGRITY SHEET

Plant: Bly the Industries, Gastonia NC  Recovered By: RBM / WDB
Sample Location: Baghouse Stack  Recovery Date: 10/30/89

| | | | |
|---|---|---|---|
| Run Number | 1 | 2 | 3 |
| Sample Date | 10/30/89 | 10/30/89 | 10/30/89 |
| Sample Box Number | 1 | 2 | 3 |
| Probe Number | 1 | 2 | 3 |
| Filter Number | 25 | 26 | 27 |

## MOISTURE RECOVERY

| | | | |
|---|---|---|---|
| Impingers Cont. Number | 1-1 | 1-2 | 1-3 |
| Description of Water | White - turbid | White - turbid | White - turbid |
| Liquid Level Marked | ✓ | ✓ | ✓ |
| Final Volume (wt.), ml | 534 | 545 | 538 |
| Initial Volume (wt.), ml | 200 | 200 | 200 |
| Net Volume (wt.), ml (g) | 334 | 345 | 338 |
| Silica Gel Cont. Number | 1-1 | 1-2 | 1-3 |
| Silica Gel % Spent | 90% | 90% | 90% |
| Final Weight, g | 221.5 | 219.0 | 216.0 |
| Initial Weight, g | 200.0 | 200.0 | 200.0 |
| Net Weight, g | 21.5 | 19.0 | 16.0 |
| Total Moisture, g | 355.5 | 364.0 | 354.0 |

## PARTICULATE RECOVERY

| | | | |
|---|---|---|---|
| Filter Cont. Number | 1-1 | 1-2 | 1-3 |
| Particulate Description | tan | tan | tan |
| Filter Cont. Sealed | ✓ | ✓ | ✓ |
| Final Weight, mg | 538.57 | 533.83 | 512.21 |
| Final Weight Audit, mg | 538.52 | 533.87 | 512.30 |
| Initial Weight, mg | 484.02 | 481.36 | 476.74 |
| Initial Weight Audit, mg | 483.86 | 481.39 | 476.54 |
| Filter Catch, mg | 54.63 | 52.47 | 35.62 |
| Probe Rinse Cont. Number | 1-1 | 1-2 | 1-3 |
| Liquid Level Marked | ✓ | ✓ | ✓ |
| Final Weight, mg | 105,333.2 | 105,768.9 | 103,846.2 |
| Final Weight Audit, mg | 105,333.7 | 105,769.4 | 103,846.7 |
| Initial Weight, mg | 105,317.9 | 105,758.4 | 103,816.2 |
| Initial Weight Audit, mg | 105,318.1 | 105,758.5 | 103,816.4 |
| Less Acetone Blank, mg | 0.0 | 0.0 | 0.0 |
| Acetone Rinse Catch, mg | 15.5 | 10.7 | 30.2 |
| Total Particulate, mg | 70.13 | 63.17 | 65.82 |

| | |
|---|---|
| Acetone Blank Number | A |
| Final Weight, mg | 106,458.5 |
| Final Weight Audit, mg | 106,458.3 |
| Initial Weight, mg | 106,458.4 |
| Initial Weight Audit, mg | 106,458.3 |
| Acetone Residue, mg | 0.0 |
| Acetone Volume, ml | 200 |
| Concentration, mg/mg | $<.5 \times 10^{-6}$ |

**LABORATORY CUSTODY**

Received By: RBM / WDB
Date Received: 10/30/89
Stored & Locked: ✓
Remarks: NONE

Visible Emission Summary Data Sheet

Company Blythe Date 10-30-89 Location Gastonia

Start time 8:45 Emission point Asphalt Plant

| Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 205 | 8.5 | 37 | 140 | 5.8 | 73 | 235 | 9.8 | 109 | 100 | 4.2 | 145 | 55 | 2.3 | 181 | 65 | 2.7 |
| 2 | 200 | 8.3 | 38 | 140 | 5.8 | 74 | 230 | 9.6 | 110 | 95 | 4.0 | 146 | 60 | 2.5 | 182 | 65 | 2.7 |
| 3 | 210 | 8.8 | 39 | 145 | 6.0 | 75 | 225 | 9.4 | 111 | 90 | 3.8 | 147 | 60 | 2.5 | 183 | 65 | 2.7 |
| 4 | 205 | 8.5 | 40 | 145 | 6.0 | 76 | 225 | 9.4 | 112 | 85 | 3.5 | 148 | 60 | 2.5 | 184 | 65 | 2.7 |
| 5 | 200 | 8.3 | 41 | 145 | 6.0 | 77 | 215 | 9.0 | 113 | 80 | 3.3 | 149 | 65 | 2.7 | 185 | 60 | 2.5 |
| 6 | 205 | 8.5 | 42 | 145 | 6.0 | 78 | 200 | 8.3 | 114 | 75 | 3.1 | 150 | 70 | 2.9 | 186 | 55 | 2.3 |
| 7 | 205 | 8.5 | 43 | 150 | 6.3 | 79 | 190 | 7.9 | 115 | 75 | 3.1 | 151 | 75 | 3.1 | 187 | 50 | 2.1 |
| 8 | 205 | 8.5 | 44 | 160 | 6.7 | 80 | 180 | 7.5 | 116 | 75 | 3.1 | 152 | 80 | 3.3 | 188 | 50 | 2.1 |
| 9 | 195 | 8.1 | 45 | 175 | 7.3 | 81 | 165 | 6.9 | 117 | 75 | 3.1 | 153 | 85 | 3.5 | 189 | 45 | 1.9 |
| 10 | 195 | 8.1 | 46 | 190 | 7.9 | 82 | 160 | 6.7 | 118 | 75 | 3.1 | 154 | 90 | 3.8 | 190 | 40 | 1.7 |
| 11 | 195 | 8.1 | 47 | 195 | 8.1 | 83 | 150 | 6.3 | 119 | 70 | 2.9 | 155 | 95 | 4.0 | 191 | 35 | 1.5 |
| 12 | 195 | 8.1 | 48 | 205 | 8.5 | 84 | 140 | 5.8 | 120 | 65 | 2.7 | 156 | 95 | 4.0 | 192 | 40 | 1.7 |
| 13 | 190 | 7.9 | 49 | 215 | 9.0 | 85 | 140 | 5.8 | 121 | 70 | 2.9 | 157 | 100 | 4.2 | 193 | 40 | 1.7 |
| 14 | 190 | 7.9 | 50 | 220 | 9.2 | 86 | 135 | 5.6 | 122 | 65 | 2.7 | 158 | 105 | 4.4 | 194 | 40 | 1.7 |
| 15 | 185 | 7.7 | 51 | 225 | 9.4 | 87 | 130 | 5.4 | 123 | 65 | 2.7 | 159 | 105 | 4.4 | 195 | 35 | 1.5 |
| 16 | 180 | 7.5 | 52 | 225 | 9.4 | 88 | 125 | 5.2 | 124 | 65 | 2.7 | 160 | 105 | 4.4 | 196 | 35 | 1.5 |
| 17 | 165 | 6.9 | 53 | 235 | 9.8 | 89 | 125 | 5.2 | 125 | 60 | 2.5 | 161 | 105 | 4.4 | 197 | 35 | 1.5 |
| 18 | 160 | 6.7 | 54 | 245 | 10.2 | 90 | 125 | 5.2 | 126 | 60 | 2.5 | 162 | 105 | 4.4 | 198 | 35 | 1.5 |
| 19 | 155 | 6.5 | 55 | 250 | 10.4 | 91 | 120 | 5.0 | 127 | 55 | 2.3 | 163 | 110 | 4.6 | 199 | 35 | 1.5 |
| 20 | 155 | 6.5 | 56 | 255 | 10.6 | 92 | 120 | 5.0 | 128 | 50 | 2.1 | 164 | 115 | 4.8 | 200 | 35 | 1.5 |
| 21 | 150 | 6.3 | 57 | 270 | 11.3 | 93 | 120 | 5.0 | 129 | 45 | 1.9 | 165 | 120 | 5.0 | 201 | 40 | 1.7 |
| 22 | 145 | 6.0 | 58 | 270 | 11.3 | 94 | 120 | 5.0 | 130 | 40 | 1.7 | 166 | 120 | 5.0 | 202 | 40 | 1.7 |
| 23 | 145 | 6.0 | 59 | 280 | 11.7 | 95 | 120 | 5.0 | 131 | 40 | 1.7 | 167 | 120 | 5.0 | 203 | 40 | 1.7 |
| 24 | 145 | 6.0 | 60 | 290 | 12.1 | 96 | 120 | 5.0 | 132 | 40 | 1.7 | 168 | 115 | 4.8 | 204 | 45 | 1.9 |
| 25 | 145 | 6.0 | 61 | 285 | 11.9 | 97 | 115 | 4.8 | 133 | 40 | 1.7 | 169 | 115 | 4.8 | 205 | 50 | 2.1 |
| 26 | 145 | 6.0 | 62 | 285 | 11.9 | 98 | 115 | 4.8 | 134 | 40 | 1.7 | 170 | 110 | 4.6 | 206 | 45 | 1.9 |
| 27 | 135 | 5.6 | 63 | 285 | 11.9 | 99 | 115 | 4.8 | 135 | 45 | 1.9 | 171 | 110 | 4.6 | 207 | 40 | 1.7 |
| 28 | 135 | 5.6 | 64 | 290 | 12.1 | 100 | 115 | 4.8 | 136 | 50 | 2.1 | 172 | 105 | 4.4 | 208 | 40 | 1.7 |
| 29 | 135 | 5.6 | 65 | 290 | 12.1 | 101 | 115 | 4.8 | 137 | 55 | 2.3 | 173 | 100 | 4.2 | 209 | 40 | 1.7 |
| 30 | 135 | 5.6 | 66 | 290 | 12.1 | 102 | 110 | 4.8 | 138 | 60 | 2.5 | 174 | 95 | 4.0 | 210 | 40 | 1.7 |
| 31 | 135 | 5.6 | 67 | 290 | 12.1 | 103 | 110 | 4.6 | 139 | 55 | 2.3 | 175 | 90 | 3.8 | 211 | 40 | 1.7 |
| 32 | 140 | 5.8 | 68 | 280 | 11.7 | 104 | 110 | 4.6 | 140 | 50 | 2.1 | 176 | 85 | 3.5 | 212 | 35 | 1.5 |
| 33 | 145 | 6.0 | 69 | 270 | 11.3 | 105 | 110 | 4.6 | 141 | 45 | 1.9 | 177 | 80 | 3.3 | 213 | 40 | 1.7 |
| 34 | 145 | 6.0 | 70 | 260 | 10.8 | 106 | 110 | 4.6 | 142 | 45 | 1.9 | 178 | 75 | 3.1 | 214 | 45 | 1.9 |
| 35 | 140 | 5.8 | 71 | 255 | 10.6 | 107 | 105 | 4.4 | 143 | 50 | 2.1 | 179 | 75 | 3.1 | 215 | 50 | 2.1 |
| 36 | 135 | 5.6 | 72 | 245 | 10.2 | 108 | 105 | 4.4 | 144 | 55 | 2.3 | 180 | 70 | 2.9 | 216 | 50 | 2.1 |

Maximum average 12.1 % Start number of six minute average —/—

Number of nonoverlapping averages in excess of standard _____ Listing start number of these averages _____

Calculated by J. Giuliani Date _____ Reviewed by _____ Date _____

Quality Assurance Handbook M9-5 1 and M9-6 2

## Visible Emission Summary Data Sheet

Company Blythe Date 10-30-89 Location Gastonia

Start time 1015 Emission point Asphalt Plant

| Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10 | 0.4 | 37 | 75 | 3.1 | 73 | 55 | 2.3 | 109 | 50 | 2.1 | 145 | 0 | 0.0 | 181 | 0 | 0.0 |
| 2 | 10 | 0.4 | 38 | 80 | 3.3 | 74 | 50 | 2.1 | 110 | 50 | 2.1 | 146 | 0 | 0.0 | 182 | 0 | 0.0 |
| 3 | 10 | 0.4 | 39 | 85 | 3.5 | 75 | 50 | 2.1 | 111 | 50 | 2.1 | 147 | 0 | 0.0 | 183 | 0 | 0.0 |
| 4 | 10 | 0.4 | 40 | 90 | 3.8 | 76 | 45 | 1.9 | 112 | 50 | 2.1 | 148 | 0 | 0.0 | 184 | 0 | 0.0 |
| 5 | 10 | 0.4 | 41 | 95 | 4.0 | 77 | 40 | 1.7 | 113 | 45 | 1.9 | 149 | 0 | 0.0 | 185 | 0 | 0.0 |
| 6 | 10 | 0.4 | 42 | 100 | 4.2 | 78 | 40 | 1.7 | 114 | 45 | 1.9 | 150 | 0 | 0.0 | 186 | 0 | 0.0 |
| 7 | 10 | 0.4 | 43 | 105 | 4.4 | 79 | 35 | 1.5 | 115 | 45 | 1.9 | 151 | 0 | 0.0 | 187 | 0 | 0.0 |
| 8 | 10 | 0.4 | 44 | 110 | 4.6 | 80 | 35 | 1.5 | 116 | 40 | 1.7 | 152 | 0 | 0.0 | 188 | 0 | 0.0 |
| 9 | 10 | 0.4 | 45 | 115 | 4.8 | 81 | 35 | 1.5 | 117 | 40 | 1.7 | 153 | 0 | 0.0 | 189 | 0 | 0.0 |
| 10 | 10 | 0.4 | 46 | 115 | 4.8 | 82 | 30 | 1.3 | 118 | 40 | 1.7 | 154 | 0 | 0.0 | 190 | 0 | 0.0 |
| 11 | 10 | 0.4 | 47 | 115 | 4.8 | 83 | 25 | 1.0 | 119 | 35 | 1.5 | 155 | 0 | 0.0 | 191 | 0 | 0.0 |
| 12 | 10 | 0.4 | 48 | 110 | 4.6 | 84 | 20 | 0.8 | 120 | 35 | 1.5 | 156 | 0 | 0.0 | 192 | 0 | 0.0 |
| 13 | 5 | 0.2 | 49 | 105 | 4.4 | 85 | 15 | 0.6 | 121 | 30 | 1.3 | 157 | 0 | 0.0 | 193 | 0 | 0.0 |
| 14 | 5 | 0.2 | 50 | 105 | 4.4 | 86 | 15 | 0.6 | 122 | 25 | 1.0 | 158 | 0 | 0.0 | 194 | 0 | 0.0 |
| 15 | 5 | 0.2 | 51 | 105 | 4.4 | 87 | 15 | 0.6 | 123 | 20 | 0.8 | 159 | 0 | 0.0 | 195 | 0 | 0.0 |
| 16 | 5 | 0.2 | 52 | 105 | 4.4 | 88 | 15 | 0.6 | 124 | 15 | 0.6 | 160 | 0 | 0.0 | 196 | 0 | 0.0 |
| 17 | 5 | 0.2 | 53 | 105 | 4.4 | 89 | 15 | 0.6 | 125 | 10 | 0.4 | 161 | 0 | 0.0 | 197 | 0 | 0.0 |
| 18 | 5 | 0.2 | 54 | 100 | 4.2 | 90 | 15 | 0.6 | 126 | 5 | 0.2 | 162 | 0 | 0.0 | 198 | 0 | 0.0 |
| 19 | 5 | 0.2 | 55 | 100 | 4.2 | 91 | 15 | 0.6 | 127 | 5 | 0.2 | 163 | 0 | 0.0 | 199 | 0 | 0.0 |
| 20 | 5 | 0.2 | 56 | 95 | 4.0 | 92 | 15 | 0.6 | 128 | 5 | 0.2 | 164 | 0 | 0.0 | 200 | 0 | 0.0 |
| 21 | 5 | 0.2 | 57 | 90 | 3.8 | 93 | 15 | 0.6 | 129 | 0 | 0.0 | 165 | 0 | 0.0 | 201 | 0 | 0.0 |
| 22 | 10 | 0.4 | 58 | 90 | 3.8 | 94 | 15 | 0.6 | 130 | 0 | 0.0 | 166 | 0 | 0.0 | 202 | 0 | 0.0 |
| 23 | 10 | 0.4 | 59 | 90 | 3.8 | 95 | 20 | 0.8 | 131 | 0 | 0.0 | 167 | 0 | 0.0 | 203 | 0 | 0.0 |
| 24 | 15 | 0.6 | 60 | 95 | 4.0 | 96 | 20 | 0.8 | 132 | 0 | 0.0 | 168 | 0 | 0.0 | 204 | 0 | 0.0 |
| 25 | 20 | 0.8 | 61 | 95 | 4.0 | 97 | 25 | 1.0 | 133 | 0 | 0.0 | 169 | 0 | 0.0 | 205 | 0 | 0.0 |
| 26 | 25 | 1.0 | 62 | 90 | 3.8 | 98 | 30 | 1.3 | 134 | 0 | 0.0 | 170 | 0 | 0.0 | 206 | 0 | 0.0 |
| 27 | 30 | 1.3 | 63 | 85 | 3.5 | 99 | 30 | 1.3 | 135 | 0 | 0.0 | 171 | 0 | 0.0 | 207 | 5 | 0.2 |
| 28 | 35 | 1.5 | 64 | 80 | 3.3 | 100 | 35 | 1.5 | 136 | 0 | 0.0 | 172 | 0 | 0.0 | 208 | 5 | 0.2 |
| 29 | 40 | 1.7 | 65 | 80 | 3.3 | 101 | 40 | 1.7 | 137 | 0 | 0.0 | 173 | 0 | 0.0 | 209 | 5 | 0.2 |
| 30 | 45 | 1.9 | 66 | 75 | 3.1 | 102 | 45 | 1.9 | 138 | 0 | 0.0 | 174 | 0 | 0.0 | 210 | 5 | 0.2 |
| 31 | 50 | 2.1 | 67 | 70 | 2.9 | 103 | 45 | 1.9 | 139 | 0 | 0.0 | 175 | 0 | 0.0 | 211 | 5 | 0.2 |
| 32 | 55 | 2.3 | 68 | 70 | 2.9 | 104 | 45 | 1.9 | 140 | 0 | 0.0 | 176 | 0 | 0.0 | 212 | 5 | 0.2 |
| 33 | 60 | 2.5 | 69 | 65 | 2.7 | 105 | 50 | 2.1 | 141 | 0 | 0.0 | 177 | 0 | 0.0 | 213 | 5 | 0.2 |
| 34 | 65 | 2.7 | 70 | 60 | 2.5 | 106 | 50 | 2.1 | 142 | 0 | 0.0 | 178 | 0 | 0.0 | 214 | 5 | 0.2 |
| 35 | 70 | 2.9 | 71 | 55 | 2.3 | 107 | 50 | 2.1 | 143 | 0 | 0.0 | 179 | 0 | 0.0 | 215 | 5 | 0.2 |
| 36 | 70 | 2.9 | 72 | 55 | 2.3 | 108 | 50 | 2.1 | 144 | 0 | 0.0 | 180 | 0 | 0.0 | 216 | 5 | 0.2 |

Maximum average 4.8 % Start number of six minute average ___

Number of nonoverlapping averages in excess of standard ___ Listing start number of these averages ___

Calculated by V. Gualtieri Date ___ Reviewed by ___ Date ___

Quality Assurance Handbook M9-5 1 and M9-6 2

## Visible Emission Summary Data Sheet

Company Blythe Date 10-30-89 Location Gastonia

Start time 1150 Emission point Asphalt Plant

| Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity | Start no | Total opacity | Average opacity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0.0 | 37 | 5 | 0.2 | 73 | 0 | 0.0 | 109 | 0 | 0.0 | 145 | 0 | 0.0 | 181 | 0 | 0.0 |
| 2 | 0 | 0.0 | 38 | 5 | 0.2 | 74 | 0 | 0.0 | 110 | 0 | 0.0 | 146 | 0 | 0.0 | 182 | 0 | 0.0 |
| 3 | 0 | 0.0 | 39 | 5 | 0.2 | 75 | 0 | 0.0 | 111 | 0 | 0.0 | 147 | 0 | 0.0 | 183 | 0 | 0.0 |
| 4 | 0 | 0.0 | 40 | 0 | 0.0 | 76 | 0 | 0.0 | 112 | 0 | 0.0 | 148 | 0 | 0.0 | 184 | 0 | 0.0 |
| 5 | 0 | 0.0 | 41 | 0 | 0.0 | 77 | 0 | 0.0 | 113 | 0 | 0.0 | 149 | 0 | 0.0 | 185 | 0 | 0.0 |
| 6 | 0 | 0.0 | 42 | 0 | 0.0 | 78 | 0 | 0.0 | 114 | 0 | 0.0 | 150 | 0 | 0.0 | 186 | 0 | 0.0 |
| 7 | 5 | 0.2 | 43 | 0 | 0.0 | 79 | 0 | 0.0 | 115 | 0 | 0.0 | 151 | 0 | 0.0 | 187 | 0 | 0.0 |
| 8 | 5 | 0.2 | 44 | 0 | 0.0 | 80 | 5 | 0.2 | 116 | 0 | 0.0 | 152 | 0 | 0.0 | 188 | 0 | 0.0 |
| 9 | 5 | 0.2 | 45 | 0 | 0.0 | 81 | 5 | 0.2 | 117 | 0 | 0.0 | 153 | 0 | 0.0 | 189 | 0 | 0.0 |
| 10 | 5 | 0.2 | 46 | 0 | 0.0 | 82 | 5 | 0.2 | 118 | 0 | 0.0 | 154 | 0 | 0.0 | 190 | 0 | 0.0 |
| 11 | 5 | 0.2 | 47 | 0 | 0.0 | 83 | 5 | 0.2 | 119 | 0 | 0.0 | 155 | 0 | 0.0 | 191 | 0 | 0.0 |
| 12 | 5 | 0.2 | 48 | 0 | 0.0 | 84 | 5 | 0.2 | 120 | 0 | 0.0 | 156 | 0 | 0.0 | 192 | 0 | 0.0 |
| 13 | 5 | 0.2 | 49 | 0 | 0.0 | 85 | 5 | 0.2 | 121 | 0 | 0.0 | 157 | 0 | 0.0 | 193 | 0 | 0.0 |
| 14 | 5 | 0.2 | 50 | 0 | 0.0 | 86 | 5 | 0.2 | 122 | 0 | 0.0 | 158 | 0 | 0.0 | 194 | 0 | 0.0 |
| 15 | 5 | 0.2 | 51 | 0 | 0.0 | 87 | 5 | 0.2 | 123 | 0 | 0.0 | 159 | 0 | 0.0 | 195 | 0 | 0.0 |
| 16 | 10 | 0.4 | 52 | 0 | 0.0 | 88 | 5 | 0.2 | 124 | 0 | 0.0 | 160 | 0 | 0.0 | 196 | 0 | 0.0 |
| 17 | 10 | 0.4 | 53 | 0 | 0.0 | 89 | 5 | 0.2 | 125 | 0 | 0.0 | 161 | 0 | 0.0 | 197 | 0 | 0.0 |
| 18 | 10 | 0.4 | 54 | 0 | 0.0 | 90 | 5 | 0.2 | 126 | 0 | 0.0 | 162 | 0 | 0.0 | 198 | 0 | 0.0 |
| 19 | 10 | 0.4 | 55 | 0 | 0.0 | 91 | 5 | 0.2 | 127 | 0 | 0.0 | 163 | 0 | 0.0 | 199 | 0 | 0.0 |
| 20 | 10 | 0.4 | 56 | 0 | 0.0 | 92 | 5 | 0.2 | 128 | 0 | 0.0 | 164 | 0 | 0.0 | 200 | 0 | 0.0 |
| 21 | 10 | 0.4 | 57 | 0 | 0.0 | 93 | 5 | 0.2 | 129 | 0 | 0.0 | 165 | 0 | 0.0 | 201 | 0 | 0.0 |
| 22 | 10 | 0.4 | 58 | 0 | 0.0 | 94 | 5 | 0.2 | 130 | 0 | 0.0 | 166 | 0 | 0.0 | 202 | 0 | 0.0 |
| 23 | 10 | 0.4 | 59 | 0 | 0.0 | 95 | 5 | 0.2 | 131 | 0 | 0.0 | 167 | 0 | 0.0 | 203 | 0 | 0.0 |
| 24 | 10 | 0.4 | 60 | 0 | 0.0 | 96 | 5 | 0.2 | 132 | 0 | 0.0 | 168 | 0 | 0.0 | 204 | 0 | 0.0 |
| 25 | 10 | 0.4 | 61 | 0 | 0.0 | 97 | 5 | 0.2 | 133 | 0 | 0.0 | 169 | 0 | 0.0 | 205 | 0 | 0.0 |
| 26 | 10 | 0.4 | 62 | 0 | 0.0 | 98 | 5 | 0.2 | 134 | 0 | 0.0 | 170 | 0 | 0.0 | 206 | 0 | 0.0 |
| 27 | 10 | 0.4 | 63 | 0 | 0.0 | 99 | 5 | 0.2 | 135 | 0 | 0.0 | 171 | 0 | 0.0 | 207 | 0 | 0.0 |
| 28 | 10 | 0.4 | 64 | 0 | 0.0 | 100 | 5 | 0.2 | 136 | 0 | 0.0 | 172 | 0 | 0.0 | 208 | 0 | 0.0 |
| 29 | 10 | 0.4 | 65 | 0 | 0.0 | 101 | 5 | 0.2 | 137 | 0 | 0.0 | 173 | 0 | 0.0 | 209 | 0 | 0.0 |
| 30 | 10 | 0.4 | 66 | 0 | 0.0 | 102 | 5 | 0.2 | 138 | 0 | 0.0 | 174 | 0 | 0.0 | 210 | 0 | 0.0 |
| 31 | 5 | 0.2 | 67 | 0 | 0.0 | 103 | 5 | 0.2 | 139 | 0 | 0.0 | 175 | 0 | 0.0 | 211 | 0 | 0.0 |
| 32 | 5 | 0.2 | 68 | 0 | 0.0 | 104 | 0 | 0.0 | 140 | 0 | 0.0 | 176 | 0 | 0.0 | 212 | 0 | 0.0 |
| 33 | 5 | 0.2 | 69 | 0 | 0.0 | 105 | 0 | 0.0 | 141 | 0 | 0.0 | 177 | 0 | 0.0 | 213 | 0 | 0.0 |
| 34 | 5 | 0.2 | 70 | 0 | 0.0 | 106 | 0 | 0.0 | 142 | 0 | 0.0 | 178 | 0 | 0.0 | 214 | 0 | 0.0 |
| 35 | 5 | 0.2 | 71 | 0 | 0.0 | 107 | 0 | 0.0 | 143 | 0 | 0.0 | 179 | 0 | 0.0 | 215 | 0 | 0.0 |
| 36 | 5 | 0.2 | 72 | 0 | 0.0 | 108 | 0 | 0.0 | 144 | 0 | 0.0 | 180 | 0 | 0.0 | 216 | 0 | 0.0 |

Maximum average 0.4 % Start number of six minute average ___/___

Number of nonoverlapping averages in excess of standard ___ Listing start number of these averages ___

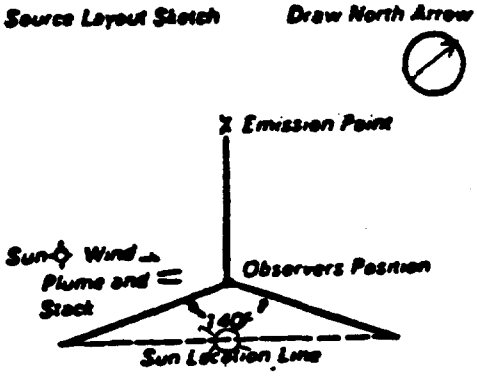
Calculated by J. Qualtieri Date ___ Reviewed by ___ Date ___

Visible Emission Observation Form

| | |
|---|---|
| SOURCE NAME | Blythe |
| ADDRESS | |
| CITY | Gastonia |
| STATE | NC |
| ZIP | |
| PHONE | |
| SOURCE ID NUMBER | |
| PROCESS EQUIPMENT | Asphalt Plant |
| OPERATING MODE | |
| CONTROL EQUIPMENT | Baghouse |
| OPERATING MODE | |
| DESCRIBE EMISSION POINT | square metal Duct |
| START | STOP |
| HEIGHT ABOVE GROUND LEVEL | START 30' STOP 30' |
| HEIGHT RELATIVE TO OBSERVER | START 30' STOP 30' |
| DISTANCE FROM OBSERVER | START 220' STOP 200' |
| DIRECTION FROM OBSERVER | START NW STOP NW |
| DESCRIBE EMISSIONS | START white to gray smoke STOP Gray Smoke |
| EMISSION COLOR | START white STOP |
| PLUME TYPE | CONTINUOUS ☑ FUGITIVE ☐ INTERMITTENT ☐ |
| WATER DROPLETS PRESENT | NO ☐ YES ☑ |
| IF WATER DROPLET PLUME | ATTACHED ☐ DETACHED ☑ |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED | START 20' Above emmission pt. STOP |
| DESCRIBE BACKGROUND | START Sky STOP sky |
| BACKGROUND COLOR | START Blue STOP Blue |
| SKY CONDITIONS | START clear STOP over cast |
| WIND SPEED | START 4 to 7 STOP 1 to 3 |
| WIND DIRECTION | START N STOP N |
| AMBIENT TEMP | START 60 STOP 65 |
| Db / Wb | 60 / 57 |
| RH percent | 82% |

Source Layout Sketch

Draw North Arrow




| OBSERVATION DATE | START TIME | STOP TIME |
|---|---|---|
| 10-30-89 | 8:45 | 9:45 |

| MIN \ SEC | 0 | 15 | 30 | 45 | MIN \ SEC | 0 | 15 | 30 | 45 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 10 | 5 | 10 | 10 | 31 | 5 | 5 | 5 | 5 |
| 2 | 5 | 10 | 5 | 10 | 32 | 0 | 5 | 5 | 5 |
| 3 | 10 | 10 | 10 | 10 | 33 | 5 | 0 | 5 | 0 |
| 4 | 10 | 10 | 10 | 20 | 34 | 0 | 0 | 0 | 0 |
| 5 | 10 | 10 | 5 | 5 | 35 | 0 | 5 | 5 | 5 |
| 6 | 5 | 5 | 5 | 5 | 36 | 5 | 0 | 0 | 5 |
| 7 | 5 | 15 | 5 | 5 | 37 | 0 | 5 | 5 | 0 |
| 8 | 10 | 10 | 5 | 0 | 38 | 0 | 0 | 0 | 0 |
| 9 | 10 | 10 | 10 | 5 | 39 | 0 | 0 | 5 | 0 |
| 10 | 10 | 5 | 5 | 5 | 40 | 0 | 5 | 5 | 5 |
| 11 | 5 | 5 | 5 | 0 | 41 | 5 | 0 | 0 | 0 |
| 12 | 0 | 5 | 5 | 5 | 42 | 5 | 5 | 5 | 5 |
| 13 | 5 | 5 | 5 | 5 | 43 | 5 | 5 | 5 | 5 |
| 14 | 10 | 10 | 10 | 5 | 44 | 5 | 5 | 5 | 5 |
| 15 | 10 | 5 | 5 | 10 | 45 | 5 | 5 | 5 | 5 |
| 16 | 10 | 10 | 5 | 5 | 46 | 5 | 5 | 5 | 5 |
| 17 | 5 | 10 | 15 | 15 | 47 | 5 | 5 | 5 | 5 |
| 18 | 15 | 10 | 15 | 15 | 48 | 5 | 5 | 0 | 5 |
| 19 | 10 | 10 | 5 | 15 | 49 | 0 | 5 | 0 | 0 |
| 20 | 20 | 15 | 15 | 20 | 50 | 0 | 0 | 0 | 0 |
| 21 | 10 | 15 | 15 | 5 | 51 | 0 | 5 | 0 | 0 |
| 22 | 10 | 10 | 10 | 5 | 52 | 5 | 5 | 5 | 0 |
| 23 | 5 | 10 | 5 | 5 | 53 | 0 | 0 | 5 | 0 |
| 24 | 5 | 5 | 5 | 5 | 54 | 0 | 0 | 5 | 5 |
| 25 | 5 | 5 | 5 | 5 | 55 | 0 | 0 | 0 | 0 |
| 26 | 5 | 5 | 5 | 5 | 56 | 0 | 0 | 0 | 5 |
| 27 | 5 | 5 | 5 | 5 | 57 | 0 | 5 | 5 | 5 |
| 28 | 5 | 5 | 5 | 5 | 58 | 0 | 0 | 5 | 0 |
| 29 | 5 | 5 | 5 | 5 | 59 | 0 | 0 | 0 | 5 |
| 30 | 5 | 5 | 5 | 0 | 60 | 5 | 5 | 5 | 5 |

| | |
|---|---|
| AVERAGE OPACITY FOR HIGHEST PERIOD | NUMBER OF READINGS ABOVE % WERE |
| RANGE OF OPACITY READINGS | MINIMUM / MAXIMUM |
| OBSERVER'S NAME (PRINT) | T. Qualtieri |
| OBSERVER'S SIGNATURE | T. Qualtieri |
| DATE | 10-30-89 |
| ORGANIZATION | Environmental Testing Inc |
| CERTIFIED BY | ETA |
| DATE | 9-20-89 |
| VERIFIED BY | |
| DATE | |

COMMENTS

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SIGNATURE

TITLE

DATE

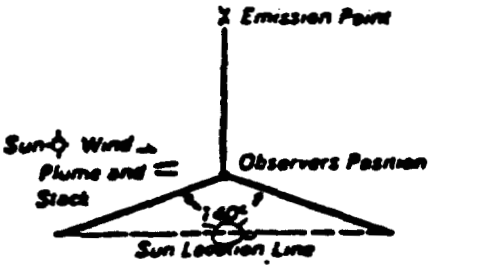
Visible Emission Observation Form

| | |
|---|---|
| SOURCE NAME | Blythe |
| ADDRESS | |
| CITY | Gastonia |
| STATE | NC |
| ZIP | |
| PHONE | |
| SOURCE ID NUMBER | |
| PROCESS EQUIPMENT | Asphaut Plant |
| OPERATING MODE | |
| CONTROL EQUIPMENT | Baghouse |
| OPERATING MODE | |
| DESCRIBE EMISSION POINT | START Square Metal Duct STOP SAME |
| HEIGHT ABOVE GROUND LEVEL | START 30' STOP 30' |
| HEIGHT RELATIVE TO OBSERVER | START 30' STOP 30' |
| DISTANCE FROM OBSERVER | START 175' STOP SAME |
| DIRECTION FROM OBSERVER | START NW STOP SAME |
| DESCRIBE EMISSIONS | START White to Gray Smoke STOP SAME |
| EMISSION COLOR | START White/Gray STOP |
| PLUME TYPE | CONTINUOUS ☑ FUGITIVE ☐ INTERMITTENT ☐ |
| WATER DROPLETS PRESENT | NO ☐ YES ☑ |
| IF WATER DROPLET PLUME | ATTACHED ☐ DETACHED ☑ |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED | START 20' above emission pt perpendicular to long. axis STOP |
| DESCRIBE BACKGROUND | START clouds STOP Sky & clouds |
| BACKGROUND COLOR | START Gray STOP Blue with White and Gray |
| SKY CONDITIONS | START 75% cloud STOP 60% cloud |
| WIND SPEED | START 1 to 3 STOP 1 to 3 |
| WIND DIRECTION | START N STOP NE |
| AMBIENT TEMP | START 69°F STOP 71°F |
| Db / Wb | 69°F . 62 |
| RH percent | 66% |

| OBSERVATION DATE | START TIME | STOP TIME |
|---|---|---|
| 10-30-89 | 1015 | 1115 |

| MIN \ SEC | 0 | 15 | 30 | 45 | MIN \ SEC | 0 | 15 | 30 | 45 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 31 | 0 | 5 | 5 | 5 |
| 2 | 0 | 0 | 0 | 0 | 32 | 5 | 5 | 5 | 0 |
| 3 | 0 | 0 | 0 | 5 | 33 | 0 | 5 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 34 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 5 | 36 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 38 | 0 | 5 | 5 | 0 |
| 9 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 41 | 0 | 0 | 0 | 0 |
| 12 | 0 | 0 | 5 | 5 | 42 | 0 | 0 | 0 | 0 |
| 13 | 5 | 5 | 5 | 5 | 43 | 0 | 0 | 0 | 0 |
| 14 | 5 | 5 | 5 | 5 | 44 | 0 | 0 | 0 | 0 |
| 15 | 5 | 5 | 5 | 5 | 45 | 0 | 0 | 0 | 0 |
| 16 | 0 | 5 | 5 | 5 | 46 | 0 | 0 | 0 | 0 |
| 17 | 5 | 5 | 5 | 5 | 47 | 0 | 0 | 0 | 0 |
| 18 | 5 | 5 | 5 | 5 | 48 | 0 | 0 | 0 | 0 |
| 19 | 0 | 0 | 5 | 5 | 49 | 0 | 0 | 0 | 0 |
| 20 | 5 | 5 | 0 | 5 | 50 | 0 | 0 | 0 | 0 |
| 21 | 0 | 0 | 5 | 5 | 51 | 0 | 0 | 0 | 0 |
| 22 | 5 | 5 | 0 | 0 | 52 | 0 | 0 | 0 | 0 |
| 23 | 0 | 5 | 0 | 0 | 53 | 0 | 0 | 0 | 0 |
| 24 | 50 | 0 | 0 | 0 | 54 | 0 | 0 | 0 | 0 |
| 25 | 0 | 0 | 0 | 5 | 55 | 0 | 0 | 0 | 0 |
| 26 | 0 | 0 | 0 | 0 | 56 | 0 | 0 | 0 | 0 |
| 27 | 0 | 0 | 0 | 0 | 57 | 0 | 0 | 0 | 0 |
| 28 | 0 | 0 | 0 | 0 | 58 | 0 | 0 | 5 | 0 |
| 29 | 0 | 5 | 0 | 0 | 59 | 0 | 0 | 0 | 0 |
| 30 | 5 | 0 | 0 | 5 | 60 | 0 | 0 | 0 | 0 |

Source Layout Sketch — Draw North Arrow




| | |
|---|---|
| AVERAGE OPACITY FOR HIGHEST PERIOD | NUMBER OF READINGS ABOVE % WERE |
| RANGE OF OPACITY READINGS | MINIMUM / MAXIMUM |
| OBSERVER'S NAME (PRINT) | J. Qualtieri |
| OBSERVER'S SIGNATURE | J. Qualtieri |
| DATE | 10-30-89 |
| ORGANIZATION | Environmental Testing Inc |
| CERTIFIED BY | ETA |
| DATE | 9-20-89 |
| VERIFIED BY | |
| DATE | |

COMMENTS

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SIGNATURE

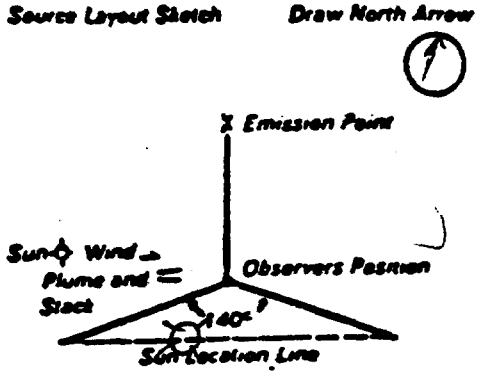
TITLE

DATE

## Visible Emission Observation Form

| | |
|---|---|
| SOURCE NAME | Blythe |
| ADDRESS | |
| CITY | Gastonia |
| STATE | NC |
| ZIP | |
| PHONE | |
| SOURCE ID NUMBER | |
| PROCESS EQUIPMENT | Asphalt Plant |
| OPERATING MODE | |
| CONTROL EQUIPMENT | Baghouse |
| OPERATING MODE | |
| DESCRIBE EMISSION POINT | START square metal Duct STOP SAME |
| HEIGHT ABOVE GROUND LEVEL | START 30' STOP 30' |
| HEIGHT RELATIVE TO OBSERVER | START 30' STOP 30' |
| DISTANCE FROM OBSERVER | START 175' STOP 175' |
| DIRECTION FROM OBSERVER | START NW STOP NW |
| DESCRIBE EMISSIONS | START white to Gray smoke STOP SAME |
| EMISSION COLOR | START white to Gray STOP |
| PLUME TYPE | CONTINUOUS ☑ FUGITIVE ☐ INTERMITTENT ☐ |
| WATER DROPLETS PRESENT | NO ☐ YES ☑ |
| IF WATER DROPLET PLUME | ATTACHED ☐ DETACHED ☑ |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED | START 20' Above emmission STOP pt perpen. to Long axis |
| DESCRIBE BACKGROUND | START Sky & clouds STOP SAME |
| BACKGROUND COLOR | START Blue & white STOP Blue & white |
| SKY CONDITIONS | START 75% cloud STOP 90% cloud |
| WIND SPEED | START 1 to 3 STOP 1 to 3 |
| WIND DIRECTION | START NE STOP NE |
| AMBIENT TEMP | START 71°F STOP 81°F |
| Db / Wb | 71°F · 66°F |
| RH, percent | 76% |

Source Layout Sketch — Draw North Arrow




| OBSERVATION DATE | START TIME | STOP TIME |
|---|---|---|
| 10-30-89 | 1150 | 1250 |

| MIN \ SEC | 0 | 15 | 30 | 45 | MIN \ SEC | 0 | 15 | 30 | 45 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 34 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 0 | 0 |
| 8 | 0 | 5 | 0 | 0 | 38 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 5 | 0 | 40 | 0 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 41 | 0 | 0 | 0 | 0 |
| 12 | 0 | 0 | 0 | 0 | 42 | 0 | 0 | 0 | 0 |
| 13 | 0 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 |
| 14 | 0 | 0 | 0 | 0 | 44 | 0 | 0 | 0 | 0 |
| 15 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 0 |
| 16 | 0 | 0 | 0 | 0 | 46 | 0 | 0 | 0 | 0 |
| 17 | 0 | 0 | 0 | 0 | 47 | 0 | 0 | 0 | 0 |
| 18 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 0 |
| 19 | 0 | 0 | 0 | 0 | 49 | 0 | 0 | 0 | 0 |
| 20 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| 21 | 0 | 0 | 0 | 0 | 51 | 0 | 0 | 0 | 0 |
| 22 | 0 | 0 | 0 | 0 | 52 | 0 | 0 | 0 | 0 |
| 23 | 0 | 0 | 0 | 0 | 53 | 0 | 0 | 0 | 0 |
| 24 | 0 | 0 | 0 | 0 | 54 | 0 | 0 | 0 | 0 |
| 25 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| 26 | 5 | 0 | 0 | 0 | 56 | 0 | 0 | 0 | 0 |
| 27 | 0 | 0 | 0 | 0 | 57 | 0 | 0 | 0 | 0 |
| 28 | 0 | 0 | 0 | 0 | 58 | 0 | 0 | 0 | 0 |
| 29 | 0 | 0 | 0 | 0 | 59 | 0 | 0 | 0 | 0 |
| 30 | 0 | 0 | 0 | 0 | 60 | 0 | 0 | 0 | 0 |

| | |
|---|---|
| AVERAGE OPACITY FOR HIGHEST PERIOD | NUMBER OF READINGS ABOVE % WERE |
| RANGE OF OPACITY READINGS | MINIMUM / MAXIMUM |
| OBSERVER'S NAME (PRINT) | J. Quattlebaum |
| OBSERVER'S SIGNATURE | J. Quattlebaum |
| DATE | 10-30-89 |
| ORGANIZATION | Environmental Testing Inc. |
| CERTIFIED BY | ETA |
| DATE | 9-20-89 |
| VERIFIED BY | |
| DATE | |
| COMMENTS | |
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| SIGNATURE | |
| TITLE | |
| DATE | |

# VISIBLE EMISSIONS EVALUATOR

*This is to certify that*

J. Qualtieri

*met the specifications of Federal Reference Method 9 and qualified as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates of Raleigh, North Carolina. This certificate is valid for six months from date of issue.*

Thomas Hose
President

224039
Certificate Number

Vice President

Asheville
Location

David Savage
Program Manager

September 30, 1989
Date of Issue

© GOES 445

LITHO IN U.S.A.

APPENDIX C

## PROCESS DATA

During the sampling the asphalt plant produced approximately 240 tons per hour.

APPENDIX D

## TEST PARTICIPANTS

| | |
|---|---|
| Richard B. McCain, III | Source Sampling Supervisor<br>Environmental Testing, Inc. |
| W. Quentin Best | Chemist<br>Environmental Testing, Inc. |
| Jay Qualtieri | Visual Emission Observer<br>Environmental Testing, Inc. |

# APPENDIX E

# CALIBRATION INFORMATION

## NOZZLES

Each new set of nozzles purchased by ETI are first machined and calibrated before being put into field use. Thereafter, whenever it becomes apparent that a nozzle has been damaged, it is again machined and recalibrated. A set of three is matched to within 0.002 inches (Difference between high and low readings). Nozzles are checked prior to each source test.

## PITOT TUBES

All pitot tubes used by ETI whether separate or attached to a sampling probe were made by ETI personnel. Prior to being put into field use, they are calibrated. In general, if a type "S" pitot tube is constructed properly, and not positioned too closely to the probe nozzle or any other obstruction, it will have a Cp of 0.83 - 0.87. As long as the pitot tube is not damaged its calibration should not change. All ETI pitot tubes are made to have a Cp of 0.84. If a pitot tube does not initially have a Cp of 0.84, it is altered until a reading of 0.84 is obtained. Pitot tubes are checked before each source test and receive a complete calibration once a year.

## DRY GAS METER AND ORIFICE METER

Complete meter box calibrations are performed annually. One point calibrations at the average orifice meter and maximum vacuum readings encountered during the compliance test are performed after each source test. If the dry gas meter calibration factor differs from 1.00 by more than \0.02 then the dry gas meter is repaired and given an annual calibration.

## THERMOMETERS, FYRITES, ORSAT AND ORSAT BAGS

Each new thermometer, pyrometer and thermocouple purchased or manufactured by ETI is checked and calibrated before being put into field use. After each source test each temperature sensing device used on the test receives a one point calibration check according to U.S. EPA guidelines.

Fyrites, orsat and orsat bags are checked before and after each source test. If they do not function according to U.S. EPA protocol that piece of equipment is either repaired or replaced.

## LABORATORY EQUIPMENT

ETI has a written quality assurance document that covers calibration and maintenance of laboratory equipment. This includes calibration of the analytical balance against Class S weights, and service contracts to maintain traceability to N.B.S. Calibration of thermometers, barometers, stopwatches and wet test meters are traceable to N.B.S. A copy of our quality assurance document may be obtained by written request.

environmental testing inc.

# METHOD 5 PRETEST - POSTEST CALIBRATION CHECKS

Plant Blythe Industries Gastonia NC Calibrated by RBM
Meter box number 1348 Date 10/27/89 + 10/31/89

**Dry Gas Meter**

Pretest meter calibration factor, Y = 1.00 (within ± 2%)
Postest meter calibration factor, Y = 1.004 (within ± 5% of pretest)
Recalibration required? Circle one: yes or (no) If yes new Y = ____
Lower cal. factor, Y = ____ for calculations (pretest or postest)

**Dry Gas Meter Thermometers**

Was a pretest temperature correction used? Circle one: yes or (no) If yes temperature correction ____ (within ± 5.4°F over range)
Postest comparison with mercury-in-glass thermometer? (within ±10.8°F at ambient temperature) Recalibration required? Circle one: yes or (no)
Recalibration temperature correction? ____ (within ±5.4°F over range
If yes, no correction necessary for calculations if meter thermometer temperature is higher; if calibration temperature is higher, add correction to average meter temperature for calculations

**Stack Temperature Sensor**

Was a pretest temperature correction used? Circle one: yes or (no) If yes temperature correction ____ °F (within ±1.5% in °R over range)
Average stack temperature of compliance test, 748 °R
Temperature of ref. thermometer for recalibration #1 755 #2 755 °R
(within ± 10% of the average stack temperature)
Temperature of stack thermometer for recalibration #1 753 #2 751 °R
Diff. between ref. and stack thermometer temps. #1 2 #2 4 °R
Do the ref. and stack values agree within ±1.5%? Circle one: (yes) or no
If yes, no correction is necessary for calculations
If no, calculations must be done twice—once with the recorded values and once with the average stack temperature corrected to correspond to the reference temperature differential; both final result values must be reported since there is no way to determine which is correct

**Barometer**

Was the pretest field barometer reading correct? Circle one: (yes) or no
Postest comparison? 0.003 in. Hg (±0.1 in. Hg) Recalibration required? Circle one: yes or (no) If yes, no correction necessary for calculations when the field barometer has a lower reading; if the mercury-in-glass reading is lower, subtract the difference from the field data readings for the calculations.

| | Pretest | Postest |
|---|---|---|
| Hg in glass | 29.404 | 29.327 |
| Field | 29.41 | 29.33 |
| Difference | 0.006 | 0.003 |

**Nozzle**

Was the nozzle calibrated to the nearest .001 in.? Circle one: (yes) or no

| | | | | | | |
|---|---|---|---|---|---|---|
| Nozzle #1: | 0.249 | 0.251 | 0.250 | 0.250 | 0.251 | : Average 0.250 |
| Nozzle #2: | 0.252 | 0.253 | 0.252 | 0.252 | 0.251 | : Average 0.252 |
| Nozzle #3: | 0.250 | 0.249 | 0.250 | 0.250 | 0.250 | : Average 0.250 |

**Impinger Thermometer**

Was a pretest temperature correction used? Circle one: yes or (no) If yes temperature correction ____ (within ±5.4°F over range)

POSTEST DRY GAS METER CALIBRATION DATA FORM (English Units)

Test Number 1 Date 10/31/89 Meter Box No. 1348 Plant Blythe Industries, Gastonia NC

Barometric Pressure, $P_b$ = 29.159 in. Hg Dry Gas Meter No. 1348 Pretest Y 1.00

| Orifice manometer setting, inches $H_2O$ $\Delta H$ | Gas Volume: Wet test meter, $ft^3$ $V_w$ | Gas Volume: Dry gas meter, $ft^3$ $V_d$ | Temperature: Wet test meter, °F $t_w$ | Temperature: Dry Gas Meter: Inlet °F $t_{d_i}$ | Temperature: Dry Gas Meter: Outlet °F $t_{d_o}$ | Temperature: Dry Gas Meter: Average °F $t_d$ | Time min. $\theta$ | Vacuum setting in. Hg | $Y_i$ | $Y_i = \frac{V_w P_b (t_d + 460)}{V_d (P_b + \frac{\Delta H}{13.6})(t_w + 460)}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 2.3 | 10 | 10.78 | 68 | 130.5 | 100.5 | 115.5 | 12.60 | 10.5 | 1.0053 | $\frac{10(29.159)(115.5+460)}{10.78(29.159+\frac{2.3}{13.6})(68+460)}$ |
| 2.3 | 10 | 10.81 | 68 | 131 | 101 | 116 | 12.66 | 10.5 | 1.0033 | $\frac{10(29.159)(116+460)}{10.81(29.159+\frac{2.3}{13.6})(68+460)}$ |
| 2.3 | 10 | 10.84 | 68 | 131.5 | 102 | 116.75 | 12.74 | 10.5 | 1.0023 | $\frac{10(29.159)(116.75+460)}{10.84(29.159+\frac{2.3}{13.6})(68+46}$ |
| | | | | | | | | | | 1.0036 |

$V_w$ = Gas volume passing through the wet test meter, $ft.^3$

$V_d$ = Gas volume passing throught the dry gas meter, $ft.^3$

$t_w$ = Temperature of the gas in the wet test meter, °F

$t_{d_i}$ = Temperature of the inlet gas of the dry gas meter, °F

$t_{d_o}$ = Temperature of the outlet gas of the dry gas meter, °F

$t_d$ = Average temperature of the gas in the dry gas meter, obtained by the average of $t_{d_i}$ and $t_{d_o}$, °F

$\Delta H$ = Pressure differential across orifice, in. $H_2O$

$Y_i$ = Ratio of accuracy of wet test meter to dry gas meter for each run

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y ± 0.05Y

$P_b$ = Barometric pressure, in. Hg

$\theta$ = Time of calibration run, min.

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## PRETEST - POSTEST THERMOMETER CALIBRATION

Client Blythe Industries Date 10/27/89 + 10/31/89

Location Gastonia NC Ref. Thermometer #5

| Thermometer | Pretest | | Postest | |
|---|---|---|---|---|
| | Temp., °F | Ref. Temp., °F | Temp., °F | Ref. Temp., °F |
| DGM # 1348 | 70/70 | 70 | 72/72 | 72 |
| DGM # 1965 | 69/70 | 70 | — | — |
| DGM # — | — | — | — | — |
| DGM # — | — | — | — | — |
| Impinger #1 | 71 | 70 | 72 | 72 |
| Impinger #2 | 70 | 70 | 72 | 72 |
| Impinger #3 | 70 | 70 | 72 | 72 |
| Impinger #4 | 70 | 70 | 71 | 72 |
| Impinger #5 | 70 | 70 | 72 | 72 |
| WB # 2 | 71 | 70 | 72 | 72 |
| DB # 2 | 70 | 70 | 72 | 72 |
| Box #1 | 70 | 70 | 72 | 72 |
| Box #2 | 70 | 70 | 73 | 72 |
| Box #3 | 70 | 70 | 72 | 72 |
| Box #4 | — | — | — | — |
| Box #5 | — | — | — | — |
| Box #6 | — | — | — | — |
| WB Omega 873 | 69 | 70 | 72 | 72 |
| DB Omega 873 | 69 | 70 | 71 | 72 |
| WB Omega #2 | 70 | 70 | 72 | 72 |
| DB Omega #2 | 70 | 70 | 71 | 72 |
| Probe 4' #1 | 70 | 70 | 72 | 72 |
| Probe 4' #2 | 70 | 70 | 72 | 72 |
| Probe 5' #1 | 70 | 70 | — | — |
| Probe 5' #2 | 71 | 70 | — | — |
| — | — | — | — | — |

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# RAC STAKSAMPLR CALIBRATION SHEET

Meter Box Serial Number: 1348 Barometric Pressure ($P_b$): 29.054

Leak Check @ 6.2 in. $H_2O$: OK Date: 10-02-89 Calibrated by: JAB

Pump: OK Pump Oil: OK Clean Quick Connects: OK

Manometers: OK Dry Test Meter: OK Thermometers: OK

Lights: OK Electrical Check: OK Variac: OK

Vacuum Gauge: OK Leak Check @ 27" Hg.: <0.001 CFM

| Man. Orifice | $CF_m$ | $CF_d$ | $T_m$ | $IT_d$ | $OT_d$ | $T_d$ avg. | Time t |
|---|---|---|---|---|---|---|---|
| 0.5 | 5 | 5.23 | 70.0 | 101.0 | 87.5 | 94.25 | 12.36 |
| 1.0 | 5 | 5.33 | 70.0 | 114.5 | 96.5 | 105.50 | 9.00 |
| 1.5 | 10 | 10.77 | 70.0 | 120.0 | 100.0 | 110.00 | 15.91 |
| 2.0 | 10 | 10.77 | 70.0 | 122.5 | 102.0 | 112.00 | 13.10 |
| 3.0 | 10 | 10.80 | 70.0 | 126.5 | 104.5 | 115.50 | 10.86 |
| 4.0 | 10 | 10.80 | 70.5 | 128.0 | 106.0 | 117.00 | 9.50 |

Calculate Y and $\Delta H_@$ as follows:

$$Y = \frac{CF_m P_b (T_d \text{ avg.} + 460)}{CF_d (P_b + \Delta H/13.6)(T_m + 460)} = 1.00 \qquad \Delta H_@ = \frac{0.0317 \ \Delta H}{P_b (T_d + 460)} \left(\frac{(T_m + 460)\ t}{CF_m}\right)^2 = 1.81$$

<u>Tolerances</u>: Y = 0.90 - <u>1.00</u> - 1.10 Y +/- 0.02Y $\Delta H_@$ = 1.6 - <u>1.84</u> - 2.1 $\Delta H_{@i}$ +/- 0.15 in.

## CALIBRATION CALCULATIONS PUMP AND ORIFICE METER

Manometer Delta H 0.5 in. $H_2O$

$$Y = \frac{5 \times 29.054\ (94.25 + 460)}{5.23\ (29.054 + 0.0368)(70.0 + 460)} = 0.998 \qquad \Delta H_@ = \frac{0.01585}{29.054\ (94.25 + 460)} \left(\frac{(70.0 + 460)\ 12.36}{5}\right)^2 = 1.545$$

Manometer Delta H 1.0 in. $H_2O$

$$Y = \frac{5 \times 29.054\ (105.50 + 460)}{5.33\ (29.054 + 0.0737)(70.0 + 460)} = 0.998 \qquad \Delta H_@ = \frac{0.03170}{29.054\ (105.50 + 460)} \left(\frac{(70.0 + 460)\ 9.00}{5}\right)^2 = 1.729$$

Manometer Delta H 1.5 in. $H_2O$

$$Y = \frac{10 \times 29.054\ (110.00 + 460)}{10.77\ (29.054 + 0.1103)(70.0 + 460)} = 0.995 \qquad \Delta H_@ = \frac{0.04755}{29.054\ (110.00 + 460)} \left(\frac{(70.0 + 460)\ 15.91}{10}\right)^2 = 1.991$$

Manometer Delta H 2.0 in. $H_2O$

$$Y = \frac{10 \times 29.054\ (112.00 + 460)}{10.77\ (29.054 + 0.1471)(70.0 + 460)} = 0.995 \qquad \Delta H_@ = \frac{0.06340}{29.054\ (112.00 + 460)} \left(\frac{(70.0 + 460)\ 13.10}{10}\right)^2 = 1.831$$

Manometer Delta H 3.0 in. $H_2O$

$$Y = \frac{10 \times 29.054\ (115.50 + 460)}{10.80\ (29.054 + 0.2206)(70.0 + 460)} = 0.999 \qquad \Delta H_@ = \frac{0.09510}{29.054\ (115.50 + 460)} \left(\frac{(70.0 + 460)\ 10.86}{10}\right)^2 = 1.855$$

Manometer Delta H 4.0 in. $H_2O$

$$Y = \frac{10 \times 29.054\ (117.00 + 460)}{10.80\ (29.054 + 0.2941)(70.5 + 460)} = 0.997 \qquad \Delta H_@ = \frac{0.12680}{29.054\ (117.00 + 460)} \left(\frac{(70.5 + 460)\ 9.50}{10}\right)^2 = 1.904$$

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# TYPE S PITOT TUBE INSPECTION DATA FORM

Date: 07-24-89
Calibrator: WQB

Specifications:
1.) Pitot tube assembly must be level.
2.) If pitot tube is damaged explain under comments section.
3.) $z = A \sin \tau$ (<0.125) and $w = A \sin \theta$ (<0.03125)
4.) $\alpha$ <10° and $\beta$ <5°

| I.D. | $\alpha_1$° | $\alpha_2$° | $\beta_1$° | $\beta_2$° | $\tau$° | $\theta$° | A, in. | z, in. | w, in. | $P_A$, in. | $P_B$, in. | $D_t$, in. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36''- 1 | 1.0 | 1.5 | 1.0 | 1.5 | 2.0 | 0.5 | 0.730 | 0.025 | 0.00640 | 0.365 | 0.365 | 0.376 |
| 36''- 2 | 2.0 | 2.0 | 2.0 | 1.5 | 0.0 | 0.5 | 1.152 | 0.000 | 0.01005 | 0.576 | 0.576 | 0.376 |
| 40''- 1 | 1.0 | 0.0 | 1.0 | 0.0 | 0.5 | 0.5 | 1.112 | 0.010 | 0.00970 | 0.556 | 0.556 | 0.385 |
| 54''- 1 | 1.0 | 0.5 | 0.5 | 1.0 | 1.0 | 1.5 | 0.960 | 0.017 | 0.02513 | 0.480 | 0.480 | 0.385 |
| 66''- 1 | 1.0 | 0.0 | 3.0 | 2.0 | 0.5 | 1.5 | 1.042 | 0.009 | 0.02728 | 0.521 | 0.521 | 0.375 |
| 96''- 1 | 0.0 | 2.0 | 2.0 | 1.5 | 2.0 | 1.5 | 0.902 | 0.032 | 0.02361 | 0.451 | 0.451 | 0.380 |
| 3' - 1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.057 | 0.000 | 0.01845 | 0.528 | 0.529 | 0.376 |
| 3' - 2 | 0.5 | 0.5 | 0.0 | 0.5 | 0.5 | 0.0 | 1.044 | 0.009 | 0.00000 | 0.522 | 0.522 | 0.375 |
| 3' - 3 | 0.5 | 0.5 | 1.0 | 0.5 | 0.5 | 1.0 | 1.044 | 0.009 | 0.01822 | 0.522 | 0.522 | 0.378 |
| 4' - 1 | 0.5 | 0.5 | 0.5 | 2.0 | 0.5 | 1.0 | 0.950 | 0.008 | 0.01658 | 0.475 | 0.475 | 0.378 |
| 4' - 2 | 0.0 | 0.5 | 0.0 | 1.5 | 1.0 | 0.5 | 0.889 | 0.016 | 0.00776 | 0.444 | 0.445 | 0.376 |
| 4' - 3 | 3.5 | 2.5 | 1.0 | 1.5 | 0.5 | 1.5 | 0.875 | 0.008 | 0.02290 | 0.437 | 0.438 | 0.376 |
| 4' - 4 | 0.5 | 3.5 | 2.5 | 1.5 | 0.5 | 1.0 | 0.837 | 0.007 | 0.01461 | 0.419 | 0.418 | 0.375 |
| 4' - 5 | 0.5 | 1.0 | 1.5 | 0.0 | 0.0 | 1.5 | 0.861 | 0.000 | 0.02254 | 0.431 | 0.430 | 0.374 |
| 4' - 6 | 0.5 | 0.0 | 0.5 | 0.5 | 1.0 | 1.5 | 0.947 | 0.017 | 0.02479 | 0.474 | 0.473 | 0.379 |
| 5' - 1 | 1.0 | 1.0 | 1.0 | 2.0 | 2.0 | 0.5 | 1.044 | 0.036 | 0.00911 | 0.522 | 0.522 | 0.373 |
| 5' - 2 | 0.5 | 1.0 | 1.0 | 1.5 | 0.5 | 0.5 | 1.046 | 0.009 | 0.00913 | 0.523 | 0.523 | 0.373 |
| 5' - 3 | 0.5 | 1.0 | 0.5 | 0.5 | 0.5 | 1.5 | 1.045 | 0.009 | 0.02736 | 0.523 | 0.522 | 0.376 |
| 5' - 4 | 3.0 | 0.5 | 0.0 | 0.5 | 2.5 | 1.0 | 1.027 | 0.045 | 0.01792 | 0.513 | 0.514 | 0.376 |
| 6' - 1 | 0.0 | 1.0 | 0.0 | 0.5 | 1.0 | 1.0 | 0.993 | 0.017 | 0.01745 | 0.496 | 0.497 | 0.376 |
| 6' - 2 | 0.5 | 0.0 | 0.0 | 0.5 | 2.0 | 1.0 | 1.008 | 0.035 | 0.01759 | 0.504 | 0.504 | 0.376 |
| 6' - 3 | 0.5 | 0.5 | 1.5 | 0.5 | 1.0 | 1.5 | 1.004 | 0.018 | 0.02628 | 0.502 | 0.502 | 0.377 |
| 6' - 4 | 1.0 | 0.5 | 1.0 | 0.0 | 2.0 | 1.0 | 1.000 | 0.035 | 0.01745 | 0.500 | 0.500 | 0.375 |
| 8' - 1 | 1.0 | 0.0 | 1.5 | 2.0 | 3.0 | 0.5 | 0.841 | 0.044 | 0.00734 | 0.420 | 0.421 | 0.378 |
| 8' - 2 | 1.0 | 0.0 | 2.5 | 3.0 | 2.0 | 2.0 | 0.871 | 0.030 | 0.03039 | 0.435 | 0.436 | 0.373 |
| 8' - 3 | 1.0 | 0.0 | 4.0 | 1.0 | 0.0 | 1.5 | 0.905 | 0.000 | 0.02369 | 0.452 | 0.453 | 0.374 |
| 8' - 4 | 2.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.007 | 0.000 | 0.00000 | 0.504 | 0.503 | 0.378 |
| 8' - 5 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 1.0 | 0.965 | 0.034 | 0.01684 | 0.482 | 0.483 | 0.380 |
| 8' - 6 | 0.5 | 2.0 | 0.5 | 2.0 | 1.0 | 0.0 | 0.917 | 0.016 | 0.00000 | 0.458 | 0.459 | 0.383 |
| 8'9'' | 1.0 | 2.0 | 1.5 | 1.5 | 1.0 | 2.0 | 0.895 | 0.016 | 0.03124 | 0.447 | 0.448 | 0.380 |
| 9'7''-1 | 0.0 | 1.0 | 0.0 | 1.0 | 0.0 | 0.5 | 0.905 | 0.000 | 0.00790 | 0.452 | 0.453 | 0.377 |
| 9'7''-2 | 0.0 | 1.0 | 3.0 | 2.0 | 3.0 | 1.5 | 0.951 | 0.050 | 0.02489 | 0.475 | 0.476 | 0.377 |
| 12'6'' | 1.5 | 1.5 | 2.5 | 2.5 | 0.0 | 0.5 | 0.809 | 0.000 | 0.00705 | 0.404 | 0.404 | 0.377 |

Comments: Only minor filing and cleaning required.

Pitot tubes requiring further calibration: None.

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METER BOX
TEMPERATURE SENSOR CALIBRATION DATA FORM
TOLERANCE: +/- 5.4 F

DATE: 07/25/89
AMBIENT TEMPERATURE, F : 72
CALIBRATOR: WQB

BAROMETRIC PRESSURE: 29.419
REFERENCE THERMOMETER # 22 & #5

| REFERENCE POINT # | | SOURCE | REFERENCE THERMOMETER TEMPERATURE,F | THERMOCOUPLE POTENTIOMETER TEMPERATURE,F | TEMPERATURE DIFFERENCE, % |
|---|---|---|---|---|---|
| Meter Box | | | | | |
| 1264A | A. | ice bath | 35 | 36 | -.20 |
| | B. | water bath | 70 | 69 | 0.19 |
| | C. | oil bath | 122 | 120 | 0.34 |
| | D. | oil bath | 170 | 169 | 0.16 |
| 1264B | A. | ice bath | 35 | 36 | -.20 |
| | B. | water bath | 70 | 70 | 0.00 |
| | C. | oil bath | 123 | 124 | -.17 |
| | D. | oil bath | 171 | 172 | -.16 |
| 1348A | A. | ice bath | 35 | 33 | 0.40 |
| | B. | water bath | 70 | 70 | 0.00 |
| | C. | oil bath | 125 | 127 | -.34 |
| | D. | oil bath | 171 | 171 | 0.00 |
| 1348B | A. | ice bath | 35 | 36 | -.20 |
| | B. | water bath | 70 | 70 | 0.00 |
| | C. | oil bath | 126 | 128 | -.34 |
| | D. | oil bath | 171 | 170 | 0.16 |
| 1401A | A. | ice bath | 35 | 36 | -.20 |
| | B. | water bath | 70 | 70 | 0.00 |
| | C. | oil bath | 128 | 128 | 0.00 |
| | D. | oil bath | 172 | 174 | -.32 |
| 1401B | A. | ice bath | 35 | 34 | 0.20 |
| | B. | water bath | 70 | 71 | -.19 |
| | C. | oil bath | 129 | 131 | -.34 |
| | D. | oil bath | 172 | 172 | 0.00 |
| 1965A | A. | ice bath | 35 | 34 | 0.20 |
| | B. | water bath | 70 | 69 | 0.19 |
| | C. | oil bath | 130 | 130 | 0.00 |
| | D. | oil bath | 172 | 174 | -.32 |
| 1965B | A. | ice bath | 35 | 35 | 0.00 |
| | B. | water bath | 70 | 70 | 0.00 |
| | C. | oil bath | 134 | 136 | -.34 |
| | D. | oil bath | 172 | 173 | -.16 |

$$\text{TEMPERATURE DIFFERENCE} = \frac{(\text{REF TEMP, F} + 460) - (\text{TEST TEMP, F} + 460)}{\text{REF TEMP, F} + 460} \times 100 \leq 1.5\%$$

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PROBE THERMOCOUPLE
TEMPERATURE SENSOR CALIBRATION DATA FORM
TOLERANCE: +/- 5.4 F

DATE: 07/25/89
AMBIENT TEMPERATURE, F : 72
CALIBRATOR: WQB

BAROMETRIC PRESSURE: 29.419
REFERENCE THERMOMETER #22 & #5

| REFERENCE POINT # | | SOURCE | REFERENCE THERMOMETER TEMPERATURE, F | THERMOCOUPLE POTENTIOMETER TEMPERATURE, F | TEMPERATURE DIFFERENCE, % |
|---|---|---|---|---|---|
| Probe - # | | | | | |
| 4'-1 | A. | oil bath | 92 | 92 | 0.00 |
| | B. | oil bath | 242 | 242 | 0.00 |
| | C. | oil bath | 383 | 385 | -.24 |
| 4'-2 | A. | oil bath | 92 | 92 | 0.00 |
| | B. | oil bath | 242 | 243 | -.14 |
| | C. | oil bath | 384 | 385 | -.12 |
| 5'-1 | A. | oil bath | 95 | 93 | 0.36 |
| | B. | oil bath | 242 | 243 | -.14 |
| | C. | oil bath | 392 | 395 | -.35 |
| 5'-2 | A. | oil bath | 97 | 96 | 0.18 |
| | B. | oil bath | 242 | 242 | 0.00 |
| | C. | oil bath | 384 | 385 | -.12 |
| 6'-1 | A. | oil bath | 98 | 97 | 0.18 |
| | B. | oil bath | 242 | 243 | -.14 |
| | C. | oil bath | 391 | 392 | -.12 |
| 6'-2 | A. | oil bath | 98 | 96 | 0.36 |
| | B. | oil bath | 244 | 246 | -.28 |
| | C. | oil bath | 385 | 386 | -.12 |
| 8'-1 | A. | oil bath | 100 | 98 | 0.36 |
| | B. | oil bath | 246 | 248 | -.28 |
| | C. | oil bath | 385 | 385 | 0.00 |
| 8'-2 | A. | oil bath | 100 | 99 | 0.18 |
| | B. | oil bath | 246 | 246 | 0.00 |
| | C. | oil bath | 385 | 385 | 0.00 |
| 8'-3 | A. | oil bath | 100 | 98 | 0.36 |
| | B. | oil bath | 246 | 248 | -.28 |
| | C. | oil bath | 385 | 385 | 0.00 |
| 8' 9" | A. | oil bath | 102 | 101 | 0.18 |
| | B. | oil bath | 247 | 249 | -.28 |
| | C. | oil bath | 386 | 386 | 0.00 |
| 9' 7" | A. | oil bath | 102 | 101 | 0.18 |
| | B. | oil bath | 248 | 249 | -.14 |
| | C. | oil bath | 391 | 392 | -.12 |

$$\text{TEMPERATURE DIFFERENCE} = \frac{(\text{REF TEMP, F} + 460) - (\text{TEST TEMP, F} + 460)}{\text{REF TEMP, F} + 460} \times 100 \leq 1.5\%$$

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SAMPLE BOX
TEMPERATURE SENSOR CALIBRATION DATA FORM
TOLERANCE: +/- 5.4 F

DATE: 07/25/89
AMBIENT TEMPERATURE, F : 72
CALIBRATOR: WQB

BAROMETRIC PRESSURE: 29.419
REFERENCE THERMOMETER # 22 & #5

| REFERENCE POINT # | | SOURCE | REFERENCE THERMOMETER TEMPERATURE,F | THERMOCOUPLE POTENTIOMETER TEMPERATURE,F | TEMPERATURE DIFFERENCE, % |
|---|---|---|---|---|---|
| Sample Box | | | | | |
| #1 | A. | oil bath | 122 | 121 | 0.17 |
| | B. | oil bath | 200 | 200 | 0.00 |
| | C. | oil bath | 220 | 220 | 0.00 |
| | D. | oil bath | 260 | 260 | 0.00 |
| | E. | oil bath | 287 | 288 | -.13 |
| #2 | A. | oil bath | 122 | 122 | 0.00 |
| | B. | oil bath | 200 | 202 | -.30 |
| | C. | oil bath | 220 | 219 | 0.15 |
| | D. | oil bath | 260 | 260 | 0.00 |
| | E. | oil bath | 287 | 285 | 0.27 |
| #3 | A. | oil bath | 122 | 121 | 0.17 |
| | B. | oil bath | 200 | 201 | -.15 |
| | C. | oil bath | 220 | 220 | 0.00 |
| | D. | oil bath | 264 | 265 | -.14 |
| | E. | oil bath | 289 | 289 | 0.00 |
| #4 | A. | oil bath | 122 | 123 | -.17 |
| | B. | oil bath | 200 | 201 | -.15 |
| | C. | oil bath | 220 | 219 | 0.15 |
| | D. | oil bath | 264 | 264 | 0.00 |
| | E. | oil bath | 290 | 291 | -.13 |
| #5 | A. | oil bath | 123 | 123 | 0.00 |
| | B. | oil bath | 200 | 199 | 0.15 |
| | C. | oil bath | 220 | 221 | -.15 |
| | D. | oil bath | 268 | 268 | 0.00 |
| | E. | oil bath | 291 | 291 | 0.00 |
| #6 | A. | oil bath | 123 | 124 | -.17 |
| | B. | oil bath | 200 | 199 | 0.15 |
| | C. | oil bath | 223 | 221 | 0.29 |
| | D. | oil bath | 268 | 266 | 0.27 |
| | E. | oil bath | 291 | 292 | -.13 |
| #7 | A. | oil bath | 123 | 124 | -.17 |
| | B. | oil bath | 200 | 198 | 0.30 |
| | C. | oil bath | 234 | 232 | 0.29 |
| | D. | oil bath | 273 | 275 | -.27 |
| | E. | oil bath | 294 | 295 | -.13 |
| #8 | A. | oil bath | 124 | 124 | 0.00 |
| | B. | oil bath | 200 | 201 | -.15 |
| | C. | oil bath | 234 | 233 | 0.14 |
| | D. | oil bath | 274 | 275 | -.14 |
| | E. | oil bath | 296 | 297 | -.13 |

$$\text{TEMPERATURE DIFFERENCE} = \frac{(\text{REF TEMP, F} + 460) - (\text{TEST TEMP, F} + 460)}{\text{REF TEMP, F} + 460} \times 100 <= 1.5\%$$

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IMPINGER
TEMPERATURE SENSOR CALIBRATION DATA FORM
TOLERANCE: +/- 2.0 F

DATE: 07/25/89
AMBIENT TEMPERATURE, F : 72
CALIBRATOR: WQB

BAROMETRIC PRESSURE: 29.419
REFERENCE THERMOMETER # 22 & #5

| REFERENCE POINT # | | SOURCE | REFERENCE THERMOMETER TEMPERATURE,F | THERMOCOUPLE POTENTIOMETER TEMPERATURE,F | TEMPERATURE DIFFERENCE, % |
|---|---|---|---|---|---|
| Impinger | | | | | |
| #1 | A. | ice bath | 32 | 32 | 0.00 |
| | B. | water bath | 70 | 70 | 0.00 |
| | C. | water bath | 95 | 95 | 0.00 |
| | D. | water bath | 130 | 130 | 0.00 |
| #2 | A. | ice bath | 32 | 32 | 0.00 |
| | B. | water bath | 70 | 71 | -.19 |
| | C. | water bath | 95 | 95 | 0.00 |
| | D. | water bath | 130 | 130 | 0.00 |
| #3 | A. | ice bath | 32 | 33 | -.20 |
| | B. | water bath | 70 | 70 | 0.00 |
| | C. | water bath | 95 | 95 | 0.00 |
| | D. | water bath | 130 | 130 | 0.00 |
| #4 | A. | ice bath | 32 | 33 | -.20 |
| | B. | water bath | 70 | 71 | -.19 |
| | C. | water bath | 95 | 95 | 0.00 |
| | D. | water bath | 130 | 131 | -.17 |
| #5 | A. | ice bath | 32 | 33 | -.20 |
| | B. | water bath | 71 | 70 | 0.19 |
| | C. | water bath | 95 | 95 | 0.00 |
| | D. | water bath | 130 | 130 | 0.00 |

$$\text{TEMPERATURE DIFFERENCE} = \frac{(\text{REF TEMP, F} + 460) - (\text{TEST TEMP, F} + 460)}{\text{REF TEMP, F} + 460} \times 100 \leq 1.5\%$$

environmental testing inc.

WET BULB - DRY BULB - NOx & HOT BOX: BIMETALLIC
TEMPERATURE SENSOR CALIBRATION DATA FORM
TOLERANCE: +/- 5.4 F

DATE: 07/25/89
AMBIENT TEMPERATURE, F : 72
CALIBRATOR: WQB

BAROMETRIC PRESSURE: 29.419
REFERENCE THERMOMETER # 22 & #5

| REFERENCE POINT # | | SOURCE | REFERENCE THERMOMETER TEMPERATURE, F | THERMOCOUPLE POTENTIOMETER TEMPERATURE, F | TEMPERATURE DIFFERENCE, % |
|---|---|---|---|---|---|
| Bimetallic | | | | | |
| Wb1 | A. | water bath | 72 | 72 | 0.00 |
| | B. | oil bath | 130 | 130 | 0.00 |
| | C. | oil bath | 185 | 184 | 0.16 |
| | D. | oil bath | 242 | 243 | -.14 |
| | E. | oil bath | 270 | 272 | -.27 |
| Db1 | A. | water bath | 72 | 71 | 0.19 |
| | B. | oil bath | 131 | 130 | 0.17 |
| | C. | oil bath | 185 | 185 | 0.00 |
| | D. | oil bath | 243 | 244 | -.14 |
| | E. | oil bath | 270 | 271 | -.14 |
| Wb2 | A. | water bath | 72 | 72 | 0.00 |
| | B. | oil bath | 131 | 130 | 0.17 |
| | C. | oil bath | 185 | 184 | 0.16 |
| | D. | oil bath | 243 | 243 | 0.00 |
| | E. | oil bath | 270 | 271 | -.14 |
| Db2 | A. | water bath | 72 | 70 | 0.38 |
| | B. | oil bath | 131 | 130 | 0.17 |
| | C. | oil bath | 185 | 186 | -.16 |
| | D. | oil bath | 243 | 243 | 0.00 |
| | E. | oil bath | 270 | 271 | -.14 |
| NOx | A. | water bath | 72 | 71 | 0.19 |
| | B. | oil bath | 131 | 131 | 0.00 |
| | C. | oil bath | 185 | 186 | -.16 |
| | D. | oil bath | 243 | 244 | -.14 |
| | E. | oil bath | 270 | 272 | -.27 |
| Hot Box | A. | water bath | 72 | 70 | 0.38 |
| | B. | oil bath | 131 | 130 | 0.17 |
| | C. | oil bath | 185 | 184 | 0.16 |
| | D. | oil bath | 244 | 242 | 0.28 |
| | E. | oil bath | 270 | 269 | 0.14 |

$$\text{TEMPERATURE DIFFERENCE} = \frac{(\text{REF TEMP, F} + 460) - (\text{TEST TEMP, F} + 460)}{\text{REF TEMP, F} + 460} \times 100 <= 1.5\%$$

environmental testing inc.

WET - BULB & DRY - BULB: OMEGA TEMP
TEMPERATURE SENSOR CALIBRATION DATA FORM
TOLERANCE: +/- 5.4 F

DATE: 07/25/89
AMBIENT TEMPERATURE, F : 72
CALIBRATOR: WQB

BAROMETRIC PRESSURE: 29.419
REFERENCE THERMOMETER # 22 & #5

| REFERENCE POINT # | | SOURCE | REFERENCE THERMOMETER TEMPERATURE, F | THERMOCOUPLE POTENTIOMETER TEMPERATURE, F | TEMPERATURE DIFFERENCE, % |
|---|---|---|---|---|---|
| Omega Temp HH-2 #1 | | | | | |
| Db1 | A. | water bath | 70 | 71 | -.19 |
| | B. | oil bath | 120 | 120 | 0.00 |
| | C. | oil bath | 170 | 171 | -.16 |
| | D. | oil bath | 220 | 221 | -.15 |
| | E. | oil bath | 260 | 259 | 0.14 |
| Wb1 | A. | water bath | 70 | 70 | 0.00 |
| | B. | oil bath | 120 | 121 | -.17 |
| | C. | oil bath | 170 | 171 | -.16 |
| | D. | oil bath | 220 | 219 | 0.15 |
| | E. | oil bath | 260 | 261 | -.14 |
| Omega Temp HH-2 #2 | | | | | |
| Db2 | A. | water bath | 70 | 71 | -.19 |
| | B. | oil bath | 120 | 121 | -.17 |
| | C. | oil bath | 171 | 172 | -.16 |
| | D. | oil bath | 221 | 222 | -.15 |
| | E. | oil bath | 262 | 262 | 0.00 |
| Wb2 | A. | water bath | 70 | 69 | 0.19 |
| | B. | oil bath | 121 | 122 | -.17 |
| | C. | oil bath | 171 | 170 | 0.16 |
| | D. | oil bath | 222 | 222 | 0.00 |
| | E. | oil bath | 262 | 261 | 0.14 |
| Omega Temp 873-F | | | | | |
| Db1 | A. | water bath | 71 | 71 | 0.00 |
| | B. | oil bath | 121 | 122 | -.17 |
| | C. | oil bath | 173 | 173 | 0.00 |
| | D. | oil bath | 222 | 223 | -.15 |
| | E. | oil bath | 262 | 263 | -.14 |
| Wb1 | A. | water bath | 72 | 71 | 0.19 |
| | B. | oil bath | 122 | 121 | 0.17 |
| | C. | oil bath | 173 | 174 | -.16 |
| | D. | oil bath | 222 | 222 | 0.00 |
| | E. | oil bath | 262 | 261 | 0.14 |
| Omega Temp 873-F High Temp | | | | | |
| | A. | oil bath | 384 | 385 | -.12 |
| | B. | m. furnace | 450 | 452 | -.22 |
| | C. | m. furnace | 575 | 573 | 0.19 |
| | D. | m. furnace | 800 | 803 | -.24 |
| | E. | m. furnace | 1140 | 1143 | -.19 |

$$\text{TEMPERATURE DIFFERENCE} = \frac{(\text{REF TEMP, F} + 460) - (\text{TEST TEMP, F} + 460)}{\text{REF TEMP, F} + 460} \times 100 <= 1.5\%$$

Whatman Inc.

Whatman Inc. • 9 Bridewell Place, Clifton, New Jersey 07014 • Telephone: (201) 777-4825
Telex: 133426 • Cable: REEVEPAP

February 1, 1979

Mr. Paul R. Jenkins, Jr.
Vice-President
Environmental Testing Inc.
1700 University Commercial Place
Charlotte, North Carolina 28213

Dear Mr. Jenkins:

Further to our telephone conversation on January 15, 1979 Reeve Angel Grade 900AF is tested with a Q128 DOP Penetrometer manufactured by the Air Technology Association to measure DOP. This is a more sophisticated unit than that listed in the Federal Register, Part II, Thursday, August 18, 1977, Environmental Protection Agency, Standards of Performance for New Stationary Sources.

Grade 900AF will meet the EPA DOP requirements of 0.05 $\leq$ percent penetration on a 0.3 micron dioctyl phthalate smoke particles as listed on page 41778 of the Federal Register, Vol. 42, No. 160, Thursday, August 18, 1977 under 3. Reagent, 3.1.1 Filters.

I hope this will satisfy your inquiry. If we can be of any further service, please contact us at your convenience.

Very truly yours,

John Zacharias
Vice President
Business Manager, Paper Division, N. A.

JZ/mpm

GCA

GCA CORPORATION
**Precision Scientific Group**

3737 West Cortland Street
Chicago, Illinois 60647
Telephone: 312-227-2660
Telex: 254028

February 2, 1984

Environmental Testing
1700 University Commercial Place
Charlotte, N.C. 28213

Attn: Mr. Paul Jenkins

Subj: Certification Wet Test Meter

Dear Mr. Jenskins:

In lieu of any printed certification from our company, we offer as follows our statement on the referenced subject.

> "The Wet Test Meter catalog number 63123, has been tested at our plant facilities using a Meter Prover Bottle NBS registration No. 4897. The Meter was found to perform to our advertised specifications of plus or minus 1/2% error in flow rate and conforms to specifications of ASTM D-1071."

Respectfully,

Bob Husberg

Bob Husberg
Supervisor, Customer Service

BH/mg

CORNING

Science Products
Corning Glass Works
Corning, New York 14831 USA
Tel: 607-974-9000

a CORNING Laboratory Sciences Company

November 18, 1986

Mr. Paul Jenkins
Environmental Testing Inc.
1700 University Commercial Place
Charlotte, NC 28213

Dear Mr. Jenkins:

Confirming our telephone conversation, our volumetric apparatus is calibrated in conformance with ASTM Standard E 542.

Very truly yours,

Allen R. Fuller
Product Engineering Supervisor

b10012

METTLER

# Weight Traceability Certificate

To: Environmental Testing, Inc
1700 University Commercial Dr.
Charlotte, NC 28213

The balances listed below have been serviced by our representative on
December 27, 1988

This is to certify that the test weights used are traceable to the National Bureau of Standards.

| | Analytical | Precision |
|---|---|---|
| METTLER identification number of test weights used: | 26 | |
| METTLER calibration date of test weights used: | 7-1-88 | |
| National Bureau of Standards test number: | 737/0670-Met49 | |

Model and serial number of balances serviced:

AE163-C57742
H54AR-677277

METTLER Service Representative

12-27-88
Date of Issue

WALTER H. KESSLER COMPANY, INC.

THERMOMETERS KESSLER HYDROMETERS

ONE-SIXTY HICKS STREET • WESTBURY, LONG ISLAND, NEW YORK • 516 EDGEWOOD 4-4064

# MANUFACTURERS CERTIFICATE OF CALIBRATION

This is to certify that the instrument listed below has been tested in our temperature calibration laboratory in accordance with the latest procedures in the finest constant temperature equipment available, against National Bureau of Standards certified master standards.

Certified for: Fisher Scientific Company

Description: Thermometer #15-041D -1/201°C in 0.2° Div Total Immersion

Instrument Serial No. 811 007 Date Certified: January 30, 1981

| Reading of This Instrument | Reading of N.B.S. Standard (True Temperature) |
|---|---|
| +0.02C | 0.00C |
| 20.00C | 20.00C |
| 40.00C | 40.00C |
| 59.96C | 60.00C |
| 79.98C | 80.00C |
| 100.02C | 100.00C |
| 119.92C | 120.00C |
| 139.98C | 140.00C |
| 160.00C | 160.00C |
| 180.00C | 180.00C |
| 199.86C | 200.00C |

The tabulated readings apply provided the ice-point reading taken after exposure for not less than 3 days to a temperature of about 25° C (77° F) is +0.02C . If the ice-point reading is found to be higher (or lower) than stated. all other readings will be higher (or lower) by the same amount.

Serial & Test numbers of National Bureau of Standards certified instruments referenced in certification of the thermometer listed above:

NBS Standard M44165,78A-227,M44451,78A-220,78A-601/602

NBS Test No 176240,219883,176240,219883,219606

WALTER H. KESSLER COMPANY. INC.

Irene Ciciulla

**KIMBLE**
Division of
Owens-Illinois

December 11, 1986

Mr. Paul R. Jenkins
Environmental Testing, Inc.
1700 University Commercial Place
Charlotte, North Carolina 28213

REF: Calibration of volumetric glassware
Mr. P. Jenkins letter 12-5-86

Dear Mr. Jenkins,

Volumetric standards, utilized by Kimble for calibration of class A and B laboratory glassware, are designed to meet applicable calibration requirements of ASTM Standard E 542.

Accuracy of balances, weights and thermometers employed for calibration of volumetric standards is traceable to National Bureau of Standards.

Sincerely,

Lew Horan
Standards Dept.

Mike Mollick
Quality Control

cc: Mr. N. DeBello - M.O.
Mr. E. Trasoras - Q.A.

Vineland, New Jersey 08360-0230 (609) 692-3600

the OMEGA Group

DATE: 12-10-85

## CERTIFICATE OF CALIBRATION

CUSTOMER: ENVIRONMENTAL TESTING INC
1700 UNIV COMMERICAL PL
CHARLOTTE NC 28213

Customer Purchase Order: 2861RO
OMEGA Work Order No: SO 511268760
MODEL: HH-2
SERIAL NO: 14403

OMEGA ENGINEERING certifies that the above instrumentation has been calibrated and tested to meet or exceed the published specifications. This calibration and testing was performed using instrumentation and standards that are traceable to the U.S. National Bureau of Standards.

Reference: NATIONAL BUREAU OF STANDARDS TEST NO(s): 36320

Tony D'Inverno
Supervisor, Instrumentation

CAL-3

OMEGA ENGINEERING, INC.
OMEGA PRESS
OMEGA INTERNATIONAL CORP.
BIOMEGA
One Omega Drive, Box 4047, Stamford, CT 06907-0047 (203) 359-1660 Telex 996404 Cable OMEGA FAX (203) 359-7700