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.

AP42 Section: 11.1

Reference Number: 318

Title: Source Sampling For Particulate Emissions, Valley Asphalt Corp., Plant #11, Xenia, OH,

Ramcon Environmental Corp., Memphis, TN,

September 23, 1993.

AP-42 Section 11.1
Reference
Report Sect. 4
Reference ~~377~~
318

APPENDIX K

OEPA STACK TEST REVIEW SUMMARY FORM

APPLICATION NUMBER 0829710020
FACILITY NAME Valley Asphalt Corp. #11
SOURCE DESCRIPTION (OR SCC CODE) Waste Oil Fired Asphaltic Concrete Batch Plant
CONTROL EQUIPMENT Baghouse
DATE(S) OF TEST 9-23-93
FINAL TEST REPORT RECEIVED ON 11-5-93
POLLUTANT(S) TESTED Pb & PM
TEST METHOD Method 5/12
TEST FIRM Ramcon
EMISSION RATES*: Pb <.0014 lb/hr Pb .72 lb/hr
ACTUAL (lb(s)/hr) PM 3.01 lb/hr ALLOWABLE** PM 63.9 lb/hr
OPERATING RATES*:
DURING TEST** 282 TPH MAXIMUM** 302 TPH
EMISSION FACTOR***
COMMENTS:

I HEREBY VERIFY THAT THE INFORMATION CONTAINED WITHIN THE STACK TEST REPORT HAS BEEN REVIEWED AND IT HAS BEEN DETERMINED THAT THE TEST PROCEDURES, ANALYSES AND CALCULATIONS ARE:

[X] AN ACCEPTABLE DEMONSTRATION OF CONFORMANCE WITH THE APPROVED TESTING METHODOLOGY.

[ ] AN UNACCEPTABLE DEMONSTRATION OF CONFORMANCE WITH THE APPROVED TESTING METHODOLOGY.

11-12-93
DATE OF REVIEW

REVIEWED BY

* BASED ON 3 RUN AVERAGE
** SPECIFY APPLICABLE UNITS
***SPECIFY IN UNITS OF MASS/INPUT

STACK TEST OBSERVATION REPORT

FACILITY: Valley Asphalt Corp. Plant #11
782 N. Valley Road
Xenia, Ohio

SOURCE: 0829710020/P001 Asphalt Plant

CONTACTS: Bill Hurst, Plant Operator
Kenny Eakins, Plant Superintendent
Fred Brammer, Maintenance Superintendent

RAPCA: Jon Hilty
Raymond Baker CFB

DATE: September 23, 1993

On the above date, a performance emissions test was conducted on source P001 for the evaluation of lead and particulate matter emissions. PTI 08-2457 allowables are: 63.9 lbs PM/hr; 20% opacity, and 0.72 lbs Pb/hr. The allowables are based on a maximum asphalt production rate of 325 TPH. Ninety percent of the max operation would be 292.5 TPH.

During the test, #4 used oil was burned to fuel the dryer and virgin aggregate was used to process asphalt.

Mr. Eakins collected oil sample at the beginning of each run and every 15 minutes thereafter until the run ended. The chemical analysis of a load of oil delivered on the day of the test is enclosed. It should be noted that the baghouse pressure drop expressed on the PTO application submitted 6/93 was 3-4" W.C. RM9 observations were conducted during the first run only (see attached form). RM9 observations were not conducted during both runs 2 and 3 due to misting precipitation and cloudy, overcast skies. A steam plume was present during all 3 runs.

Listed below are the process parameters recorded during the test:

	Beginning	**End**
Run #1 8:32 a.m. - 9:37 a.m.		
ΔP baghouse	1.8" w.c.	1.9" w.c
agg. temp	346 °F	357 °F
stack exit temp	260 °F	260 °F
asphalt production (TPH)	277 (8:33-9:32 weigh tickets)	

	Beginning	End
Run #2 20:49 a.m. - 11:54 a.m.		
ΔP baghouse	2" w.c.	2" w.c.
agg temp	337 °F	340 °F
stack exit temp	280 °F	280 °F

asphalt production (TPH) 302 (10:54 - 11:54 weigh tickets)

	Beginning	End
Run #3 12:44 p.m. - 1:48 p.m.		
ΔP baghouse	2.2" w.c.	2.0"
agg temp	354 °F	344 °F
exit temp	255 °F	280 °F

asphalt production (TPH) 268 (12:46 - 1:49 weigh tickets)

During the test runs, trucks were loaded approximately every 3 minutes with about 16 tons of asphalt.

/bw

Visible Emission Observation Form

SOURCE NAME VALLEY ASPHALT #11

ADDRESS N. VALLEY RD.

0829710020

CITY

STATE OH

ZIP

PHONE

SOURCE ID NUMBER P001

PROCESS EQUIPMENT ASPHALT PLANT

OPERATING MODE ON

CONTROL EQUIPMENT FABRIC FILTER

OPERATING MODE ON

DESCRIBE EMISSION POINT
START ROUND METAL STACK **STOP** ✓

HEIGHT ABOVE GROUND LEVEL
START ~30' **STOP** ✓

HEIGHT RELATIVE TO OBSERVER
START ~10' **STOP** ✓

DISTANCE FROM OBSERVER
START ~50' **STOP** ✓

DIRECTION FROM OBSERVER
START NNW **STOP**

DESCRIBE EMISSIONS
START FANNING PLUME **STOP** ✓

EMISSION COLOR
START STEAM **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 1 FOOT ABOVE STACK EXIT **STOP** ✓

DESCRIBE BACKGROUND
START DUCTWORK + TREES **STOP** ✓

BACKGROUND COLOR
START YELLOW GREEN **STOP** ✓

SKY CONDITIONS
START OVERCAST CLOUDY **STOP** ✓

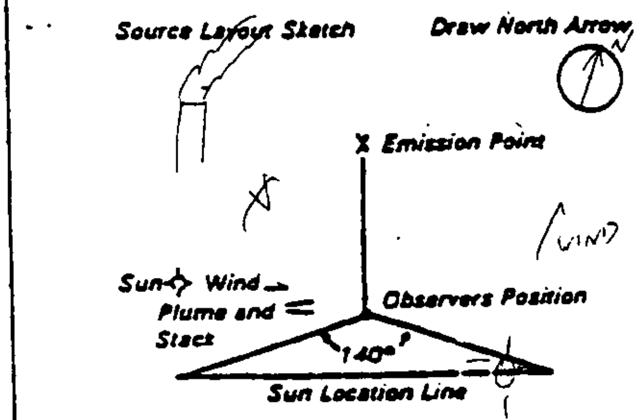
WIND SPEED
START 10-15 MPH **STOP** ✓

WIND DIRECTION
START S **STOP** ✓

AMBIENT TEMP.
START ~65°F **STOP** ✓

WET BULB TEMP.

RH, percent



COMMENTS Run #1

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS
SIGNATURE
TITLE
DATE

OBSERVATION DATE 9-23-93

START TIME 9:00 a.m

STOP TIME 9:12 a.m

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

AVERAGE OPACITY FOR HIGHEST PERIOD

NUMBER OF READINGS ABOVE 20 **% WERE** 0

RANGE OF OPACITY READINGS
MINIMUM 0 **MAXIMUM** 0

OBSERVER'S NAME (PRINT) Raymond F. Baker

OBSERVER'S SIGNATURE Raymond F. Baker

DATE 9-23-93

ORGANIZATION RAPCA

CERTIFIED BY ETA

DATE 9/93

VERIFIED BY

DATE

CLARK PROCESSING, INC.
A Wholly Owned Subsidiary of Quadrex Corporation

INVOICE NUMBER 4043

EPA # OHD 004274031
FED.I.D.# 31-0449452

MAILING ADDRESS:
300 S. West End Avenue
Dayton, OH 45427

REMITTANCE ADDRESS:
c/o Quadrex Corporation
P.O. Box 620000
Orlando, FL 32891-8299

TELEPHONE: (513) 268-650
FAX NO.: (513) 268-905

TOLL FREE NUMBERS
OHIO 1-800-762-3602
OTHER 1-800-543-3670

BILL TO:	GENERATOR:
#552 VALLEY ASPHALT CORP. 1901 DRYDEN RD. DAYTON, OHIO 45439	EPA # OHD981193667 VALLEY ASPHALT - PLANT 11 586 N. VALLEY RD. XENIA, OHIO 45385

CASH	CHARGE	[illegible]	DRIVER	TRUCK NO.	SALESMAN	DATE
	X		DAN	87/106		9-23-9

DRIVER TICKET NO.	TICKET DATE	MANIFEST/BILL OF LADING	CUSTOMER PURCHASE ORDER

AMOUNT	PRODUCT	CODE	UNIT PRICE	TOTAL PRICE
6,729	COMBUSTIBLE LIQUID, N.O.S. (OFF-SPECIFICATION USED OIL FUEL) NA 1993 (VIS 90)			

THIS USED OIL IS SUBJECT TO EPA REGULATION UNDER 40 CFR, PART 266. THIS USED OIL IS SUBJECT TO OHIO EPA REGULATION UNDER RULES 3745-58-50 TO 3745-58-54 OF THE OHIO ADMINISTRATIVE CODE.

CHEMICAL ANALYSIS:

BTU'S	>	140,000
FLASH POINT	>	140°F
ARSENIC	<	1 PPM
CADMIUM	<	1 PPM
CHROMIUM	<	10 PPM
LEAD	<	120 PPM
MERCURY	<	1 PPM
PCB's	<	1 PPM
TOTAL HALOGENS	<	4000 PPM *

* CLARK PROCESSING, INC., HAS DEMONSTRATED TO OHIO EPA's DIVISION OF SOLID AND HAZARDOUS WASTE MANAGEMENT AS A "MARKETER" IN 40 CFR 266.43(e) THAT USED OIL CONTAINING MORE THAN 1000 PPM OF TOTAL HALOGENS BUT LESS THAN 4000 PPM DOES NOT CONTAIN ANY LISTED HAZARDOUS WASTE CONSTITUENTS. (BURNERS ARE SUPPLIED WITH A ONE-TIME LETTER FROM CLARK ISSUED BY THE OEPA.)

IN AN INCIDENT REGARDING THIS SHIPMENT, CONTACT CLARK PROCESSING, INC., AT (513) 268-6501.

TANK# B-3 | TERMS NET 10 DAYS | 1½% FINANCE CHARGE will be added to your statement monthly on all invoices that are 30 days or more past due. This is an ANNUAL PERCENTAGE RATE OF 18%. | TOTAL AMOUNT

REC'D BY V. Bahn FIRM ____________

SUBJECT TO CORRECTION OF CLERICAL ERRO

PARTICULATE EMISSION TEST REVIEW SHEET

1. Facility Name: Valley Asphalt #1
2. Run Number:
3. Test Date: 1-23-92
4. Time of Test: 60 (min)
5. Volume Metered: 45.037 46.823 43.831 (ft3)
6. Dry Gas Meter Calb. Factor: .979
7. Test Barometric Pressure: 29.75 (in. Hg)
8. Avg. Delta H: 2.02 2.08 1.87 (in. H_2O)
9. Avg. Meter Temp: 73.63 78.48 79.15 (Deg. F)
10. Volume H_2O (Impingers): 201.6 285.3 263.9 (ML)
11. Weight Gain of Silica Gel: — — — (GM)
12. % CO_2: 2.87 3.4 3.7
13. % CO: — — —
14. % O_2: 14.2 15.6 15.1
15. % N_2: 82.9 81 81.2
16. Static Pressure of Stack: +.01 (in. H_2O)
17. Stack Temp: 245.125 250.79 245 (Deg. F)
18. Pitot Coefficient: .84
19. Avg. Root Delta P: .74 .74 .6976
20. Stack Diameter: 60 (in.)
21. Mass Particulate: 20.2 27.6 40.9 (mg)
22. Nozzle Diameter: .275 (in.)

Coal Data

1. % Hydrogen:
2. % Carbon:
3. % Sulfur
4. % Nitrogen:
5. % Oxygen:
6. F Factor:
7. Gross Calorific Value:

```
================================================================

PARTICULATE EMISSION TEST DATA

FACILITY :valley asphalt #11
PROCESS/RUN NUMBER :
SOURCE/RUN :1
TEST DATE :9-23-93

**************************************************************

VOLUME METERED AT STD. CONDITIONS  = 43.57729984452027 DSCF

VOLUME WATER COLLECTED AT STP.     = 9.771732 SCF
PERCENT MOISTURE BY VOLUME         = 18.31660606040351 %

MOLECULAR WEIGHT OF STACK GAS      = 27.00052981141626 LB/LB-MOL
PERCENT EXCESS AIR                 = 184.7611116893931 %

AVERAGE STACK GAS VELOCITY         = 49.78796599704408 FT/SEC
ABSOLUTE STACK PRESSURE            = 29.75073529411765 IN. HG

STACK FLOW RATE AT ACTUAL COND.    = 58646.24090723816 ACFM
STACK FLOW RATE AT STD. COND.      = 35653.66062905329 DSCFM

STACK EMISSIONS                    = 7.138579056295465E-003 GR/DSCF ✓
                                   = 1.020102947144622E-006 LB/DSCF

STACK EMISSION RATE                = 2.182224257051486 LB/HR ✓

ISOKINETIC VARIATION               = 96.96074311600643 % ✓

**************************************************************

TIME OF TEST                       = 60 MIN
VOLUME METERED                     = 45.037 CU.FT
DRY GAS METER CALB. FACT.          = .979
TEST BAR. PRESSURE                 = 29.75 IN HG
AVERAGE DELTA H                    = 2.02
AVG. METER TEMP.                   = 73.63 DEG. F
VOL. H2O (IMPINGERS)               = 207.6 ML
WEIGHT GAIN OF SILICA GEL          = 0 GM
%CO2                               = 2.87 %
%CO                                = 0 %
%O2                                = 14.2 %
%N2                                = 82.90000000000001 %
STATIC P OF STACK                  = 1E-002 IN. H2O
STACK TEMP.                        = 245.125 DEG. F
PITOT COEFFICIENT                  = .84
AVG. ROOT DELTA P                  = .74
STACK DIAMETER                     = 60 IN.
MASS PARTICULATE                   = 20.2 MG
NOZZLE DIAMETER                    = .275 IN
**************************************************************
```

```
===================================================================

PARTICULATE EMISSION TEST DATA

FACILITY :valley asphalt #11
PROCESS/RUN NUMBER :
SOURCE/RUN :2
TEST DATE :9-23-93

*************************************************************

VOLUME METERED AT STD. CONDITIONS  = 44.90398018122886 DSCF

VOLUME WATER COLLECTED AT STP.     = 13.476141 SCF
PERCENT MOISTURE BY VOLUME         = 23.08344129359743 %

MOLECULAR WEIGHT OF STACK GAS      = 26.59004127633104 LB/LB-MOL
PERCENT EXCESS AIR                 = 269.7095435684647 %

AVERAGE STACK GAS VELOCITY         = 50.371933318201 FT/SEC
ABSOLUTE STACK PRESSURE            = 29.75073529411765 IN. HG

STACK FLOW RATE AT ACTUAL COND.    = 59334.10769417532 ACFM
STACK FLOW RATE AT STD. COND.      = 33696.06881556009 DSCFM

STACK EMISSIONS                    = 9.465530634134718E-003 GR/DSCF ✓
                                   = 1.352624327617851E-006 LB/DSCF

STACK EMISSION RATE                = 2.734687345500709 LB/HR ✓

ISOKINETIC VARIATION               = 105.7183202417792 % ✓

*************************************************************

TIME OF TEST                       = 60 MIN
VOLUME METERED                     = 46.823 CU.FT
DRY GAS METER CALB. FACT.          = .979
TEST BAR. PRESSURE                 = 29.75 IN HG
AVERAGE DELTA H                    = 2.08
AVG. METER TEMP.                   = 78.48 DEG. F
VOL. H2O (IMPINGERS)               = 286.3 ML
WEIGHT GAIN OF SILICA GEL          = 0 GM
%CO2                               = 3.4 %
%CO                                = 0 %
%O2                                = 15.6 %
%N2                                = 81 %
STATIC P OF STACK                  = 1E-002 IN. H2O
STACK TEMP.                        = 250.79 DEG. F
PITOT COEFFICIENT                  = .84
AVG. ROOT DELTA P                  = .74
STACK DIAMETER                     = 60 IN.
MASS PARTICULATE                   = 27.6 MG
NOZZLE DIAMETER                    = .275 IN
*************************************************************
```

```
=============================================================

PARTICULATE EMISSION TEST DATA

FACILITY :valley asphalt #11
PROCESS/RUN NUMBER :
SOURCE/RUN :3
TEST DATE :9-23-93

*************************************************************

VOLUME METERED AT STD. CONDITIONS  = 41.96069098823983 DSCF

VOLUME WATER COLLECTED AT STP.     = 12.657123 SCF
PERCENT MOISTURE BY VOLUME         = 23.17398313071501 %

MOLECULAR WEIGHT OF STACK GAS      = 26.60144084868515 LB/LB-MOL
PERCENT EXCESS AIR                 = 238.2906198712283 %

AVERAGE STACK GAS VELOCITY         = 47.28182174789856 FT/SEC
ABSOLUTE STACK PRESSURE            = 29.75073529411765 IN. HG

STACK FLOW RATE AT ACTUAL COND.    = 55694.20347328467 ACFM
STACK FLOW RATE AT STD. COND.      = 31851.1767496641 DSCFM

STACK EMISSIONS                    = 1.501071562850404E-002 GR/DSCF ✓
                                   = 2.145031263313227E-006 LB/DSCF

STACK EMISSION RATE                = 4.099306194080691 LB/HR ✓

ISOKINETIC VARIATION               = 104.510974043737 % ✓

*************************************************************


TIME OF TEST                       = 60 MIN
VOLUME METERED                     = 43.831 CU.FT
DRY GAS METER CALB. FACT.          = .979
TEST BAR. PRESSURE                 = 29.75 IN HG
AVERAGE DELTA H                    = 1.87
AVG. METER TEMP.                   = 79.15000000000001 DEG. F
VOL. H2O (IMPINGERS)               = 268.9 ML
WEIGHT GAIN OF SILICA GEL          = 0 GM
%CO2                               = 3.7 %
%CO                                = 0 %
%O2                                = 15.1 %
%N2                                = 81.2 %
STATIC P OF STACK                  = 1E-002 IN. H2O
STACK TEMP.                        = 245 DEG. F
PITOT COEFFICIENT                  = .84
AVG. ROOT DELTA P                  = .6976
STACK DIAMETER                     = 60 IN.
MASS PARTICULATE                   = 40.9 MG
NOZZLE DIAMETER                    = .275 IN
*************************************************************
```

RAMCON
ENVIRONMENTAL CORPORATION

RECEIVED
NOV 0 5 1993
REGIONAL AIR POLLUTION
CONTROL AGENCY

Source Sampling for Particulate and Lead Emissions

Plant No. 11 — McCarter Batch-Mix Baghouse
Permit No. 0829710020P001

VALLEY ASPHALT CORPORATION
XENIA, OHIO
September 23, 1993

Fred Brammer
Fred Brammer
Valley Asphalt Corporation

W Sewell
William Joseph Sewell, II
Vice President
RAMCON Environmental Corporation

RAMCON BUILDING, 6707 FLETCHER CREEK COVE, MEMPHIS, TENNESSEE 38133
TELEPHONE 800/458-4567 IN TENNESSEE 901/387-0500 FAX 901/387-0400

RAMCON
ENVIRONMENTAL CORPORATION

October 27, 1993

Mr. Fred Brammer
Valley Asphalt Corporation
11641 Mosteller Road
Cincinnati, Ohio 45421

RE: Particulate Emissions Test — Plant No. 11: September 23, 1993

Dear Mr. Brammer:

Enclosed you will find three (3) copies of our report on the particulate and lead emissions test we conducted pursuant to permit no. 0829710020P001 at your asphalt plant located in Xenia, Ohio. Based on our test results, the average grain loading of the three test runs do pass the standards set by the State of Ohio. Therefore, the plant is operating in compliance with State standards.

You will want to sign the report covers and send one copy to:

Mr. John Hilty
Regional Air Pollution Control Agency
OHIO ENVIRONMENTAL PROTECTION AGENCY
P. O. Box 972, 451 W. Third St.
Dayton, Ohio 45422

You will need to keep one copy of the report at the plant.

We certainly have enjoyed working with you. Please let us know if we can be of further assistance.

Sincerely,

William Joseph Sewell, II
Vice President

WJSii:wpc
Enclosures

RAMCON BUILDING, 6707 FLETCHER CREEK COVE, MEMPHIS, TENNESSEE 38133
TELEPHONE 800/458-4567 IN TENNESSEE 901/387-0500 FAX 901/387-0400

TABLE OF CONTENTS

SECTION A.

1. INTRODUCTION

On September 23, 1993 personnel from RAMCON Environmental Corporation conducted a source emissions test pursuant to permit no. 0829710020P001 for particulate and lead emissions compliance at Valley Asphalt Corporation's McCarter batch-mix asphalt plant no. 11 located in Xenia, Ohio. RAMCON personnel conducting the test were Allen Turner, Team Leader, and Clint Daniels. Tommy South was responsible for the laboratory analysis including taring the beakers and filters and recording final data in the laboratory record books. Custody of the samples was limited to Mr. Turner and Mr. South.

The purpose of the test was to determine if the rate of particulate emissions from this plant's baghouse is below or equal to the allowable emissions limit set by US EPA and the State of Ohio.

2. TEST RESULTS

The particulate and lead emissions test results are summarized in the Table at the end of this section. The grain loading limitation for EPA is .04 gr/dscf as specified in 39 FR 9314, March 8, 1974, 60.92 Standards for Particulate Matter (1), as amended. The allowable emissions for the State of Ohio are the same as those set by EPA. This summary table provides the test results in concentration values of grains per dry standard cubic feet (gr/dscf) and in emission values of pounds per hour (lb/hr).

Mr. John Hilty of Ohio's Regional air Pollution Control Agency observed the testing conducted by RAMCON Environmental Corporation.

SUMMARY OF TEST RESULTS

TABLE I

May 11, 1993

Test Run	Time	Conc. Emissions gr/dscf	Lead Conc., gr/dscf	Isokinetic Variation	Particulate Emissions lbs/hr	Lead Emissions lb/hr
1	08:31 - 09:36	0.0071	0.000007	97.0%	2.18	0.0021
2	10:16 - 11:53	0.0095	<0.000003	105.7%	2.74	<0.0009
3	12:42 - 13:47	0.0150	<0.000004	104.2%	4.12	<0.0011
	Average:	0.0105	<0.000005		3.01	<0.0014

On the basis of these test results, the average grain loading of the three test runs is below the .04 gr/DSCF allowable emissions limitation set by EPA and the State of Ohio. Therefore, the plant is operating in compliance with State standards.

3. TEST PROCEDURES

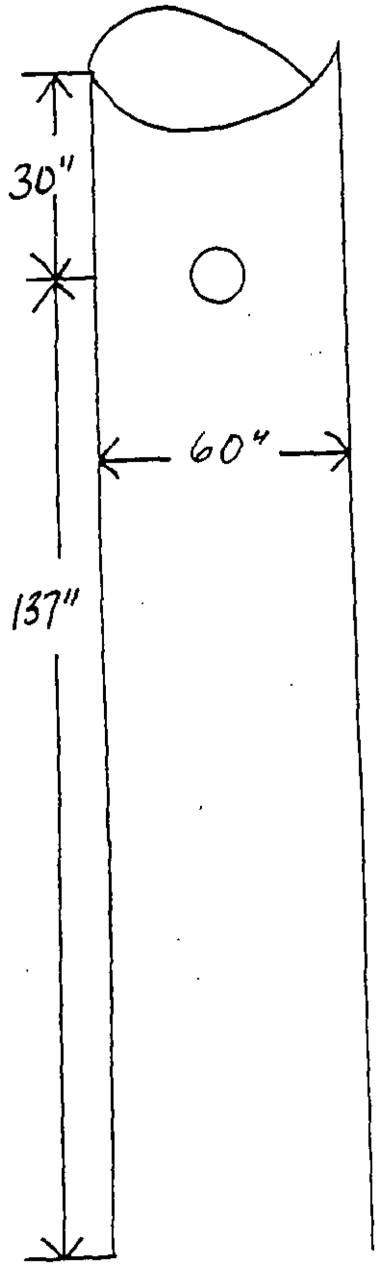
(a) Method Used: Method 5/12 source sampling was conducted in accordance with requirements of the U.S. Environmental Protection Agency as set forth in 39 FR 9314, March 8, 1974, 60.93, as amended.

(b) Problems Encountered: No problems were encountered that affected testing.

(c) Sampling Site: The emissions test was conducted after a baghouse on a round stack with a diameter of 60". The sampling ports were placed 90° apart, 30" down (.5 diameters upstream) from the top of the stack and 137" up (2.3 diameters downstream) from the last flow disturbance. Twenty-four (24) points were sampled, five (5) through each port for two and one-half (2½) minutes each for a total testing time of sixty (60) minutes.

Points on a Diameter	Probe Mark*
1	7.3"
2	10.0"
3	13.0"
4	16.6"
5	21.0"

* Measurements include a 6" standoff.



THE SOURCE

Valley Asphalt Corporation employs a McCarter batch-mix asphalt plant which is used to manufacture hot mix asphalt for road pavement. The process consists of blending prescribed portions of cold feed materials (sand, gravel, screenings, chips, etc.) uniformly and adding sufficient hot asphalt oil to bind the mixture together. After the hot asphalt mix is manufactured at the plant, it is transported to the location where it is to be applied. The hot asphalt mix is spread evenly over the surface with a paver then compacted with a heavy roller to produce the final product.

The following is a general description of the plant's manufacturing process: The cold feed materials (aggregate) are dumped into separate bins which in turn feed a common continuous conveyor. The aggregate is dispensed from the bins in accordance with the desired formulation onto the cold feed system conveyor, to an inclined weigh conveyor, then to a rotating drum for continuous mixing and drying at approximately 300°F. When recycled asphalt mix is used, it is added directly into the pugmill. The dried aggregate is pulled by a bucket elevator to the top of a gradation control unit which separates and stores the aggregate by size. The required amount of each aggregate is dispensed into a weigh-hopper and from there into a pugmill where the hot liquid asphalt pavement is mixed thoroughly with the aggregate. The hot asphalt mix is then discharged from the storage silo through a slide gate into waiting dump trucks which transports the material to a final destination for spreading. The rated capacity of the plant will vary with each aggregate mix and moisture content with a 5% surface moisture removal.

The mixer uses a burner fired with no. 4 fuel oil to heat air to dry the aggregate. The air is drawn into the system via an exhaust fan. After passing through the gas burner, the air passes through a baghouse. The baghouse is manufactured by McCarter. The exhaust gas is drawn through the baghouse and discharged to the atmosphere through the stack. The design pressure drop across the tube sheet is 2 - 6 inches of water. The particulate matter, which is removed by the baghouse, is reinjected into the pugmill.

Form [illegible]C#[illegible]

DATA ON FACILITY BEING STACK TESTED

COMPANY NAME Valley AsphaLT COMPANY REP. Kenny Egking PHONE (513) 426-7682

LOCATION OF FACILITY Xenia, Ohio ORIGINAL START-UP DATE ____ DESIGNED CAPACITY ____

OEM ____ MODEL NO. ____ TYPE ____ AC TYPE ____

1 Time (24 HR) NOTE: check small box in column when moisture sample is taken	2 Fuel Use 4 # Fuel Oil ☐ Nat. Gas ☐ Propane ☐ Coal ☐ other	3 Burner Setting	4 Blower Pressure	5 Production Rate ☐ Mix ☐ Aggregate TPH	☐ RAP TPH	6 Asphalt Cement %	7 Mix Temp. °F	8 Exhaust Gas Temp. °F	9 ☐ Venturi Scrubber ☐ Baghouse Pressure Drop In w.g.	Water Pressure psi	10 Ambient Temp. °F	11 Relative Humidity %	12 Exhaust Damper Position
	# 4	10%	~~292~~	292		4.2	300	260	2				Full Open
	# 4	10%	~~292~~	292		4.2	300	270	2				" "
	# 4	10%	~~295~~	295		4.2	300	260	2				" "
	# 4	20%	~~294~~	294		4.2	300	280	2				" "
	# 4	25%	~~297~~	297		4.2	300	280	2				Full Open
	# 4	20%	~~297~~	297		4.2	300	270	2				" "
	# 4	20%	~~300~~	300		4.2	300	290	2				" "
	# 4	25%	~~306~~	306		4.2	300	290	2				" "
	# 4	20%		307		4.2	300	260	2				Full Open
	# 4	20%		313		4.2	300	280	2				" "
	# 4	25%		312		4.2	300	290	2				" "
	# 4	20%		315		4.2	300	28	2				" "

DATA SUMMARY ON STACK BEING TESTED

AGGREGATE

1. Name/type of mix 301

2. Name/type of 2nd mix (if used) ______

3. Type/temperature of Liquid Asphalt ______/ 300 °F

4. Sieve/Screening analysis: ______ % Passing;

1st mix / 2nd mix		1st mix / 2nd mix		1st mix / 2nd mix
1"	___/___	3/8"	___/___	#___ ___/___
3/4"	___/___	#200	___/___	#___ ___/___
1/2"	___/___	#___	___/___	#___ ___/___

CONTROL SYSTEM

Manufacturer McCANTER

A. Baghouse:

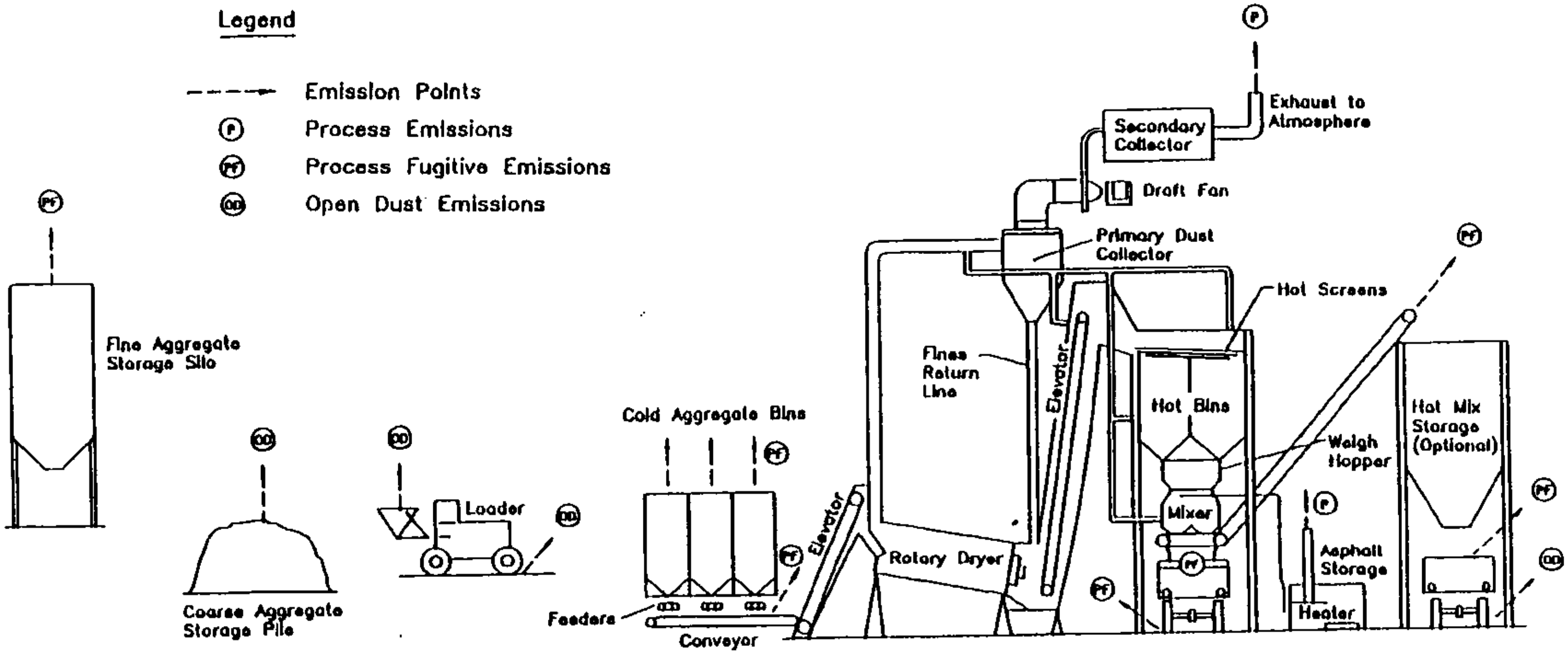
1. Type of bags nomex # of bags ______ Sq. ft. of bags ______
2. Air to cloth ratio 6.1 To 1 Designed ACFM 64,000
3. Type of cleaning - pulse jet ✓ reverse air ______ plenum pulse ______ other ______
4. Cleaning cycle time 9 Sec Interval between cleaning cycle ______
5. Pulse pressure on cleaning cycle 100 Yh psi

B. Scrubber:

1. Type - Venturi ______ Wet Washer ______
   Spray Booth ______ Other ______
2. Gallons per minute through system ______
3. Water source ______ (i.e., pond, lagoon, etc.)
4. Number of spray nozzles ______

Company Name VALLEY ASPHALT Date 9-23-93

Company Representative KENNY EAKINS



General Process Flow Diagram for A Batch-Mix Asphalt Paving Plant

EQUIPMENT USED

Equipment used to conduct the particulate emissions test was:

A. A Lear Siegler PM-100 stack sampler with appropriate auxiliary equipment and glassware (with train set up according to the schematic on the next page).

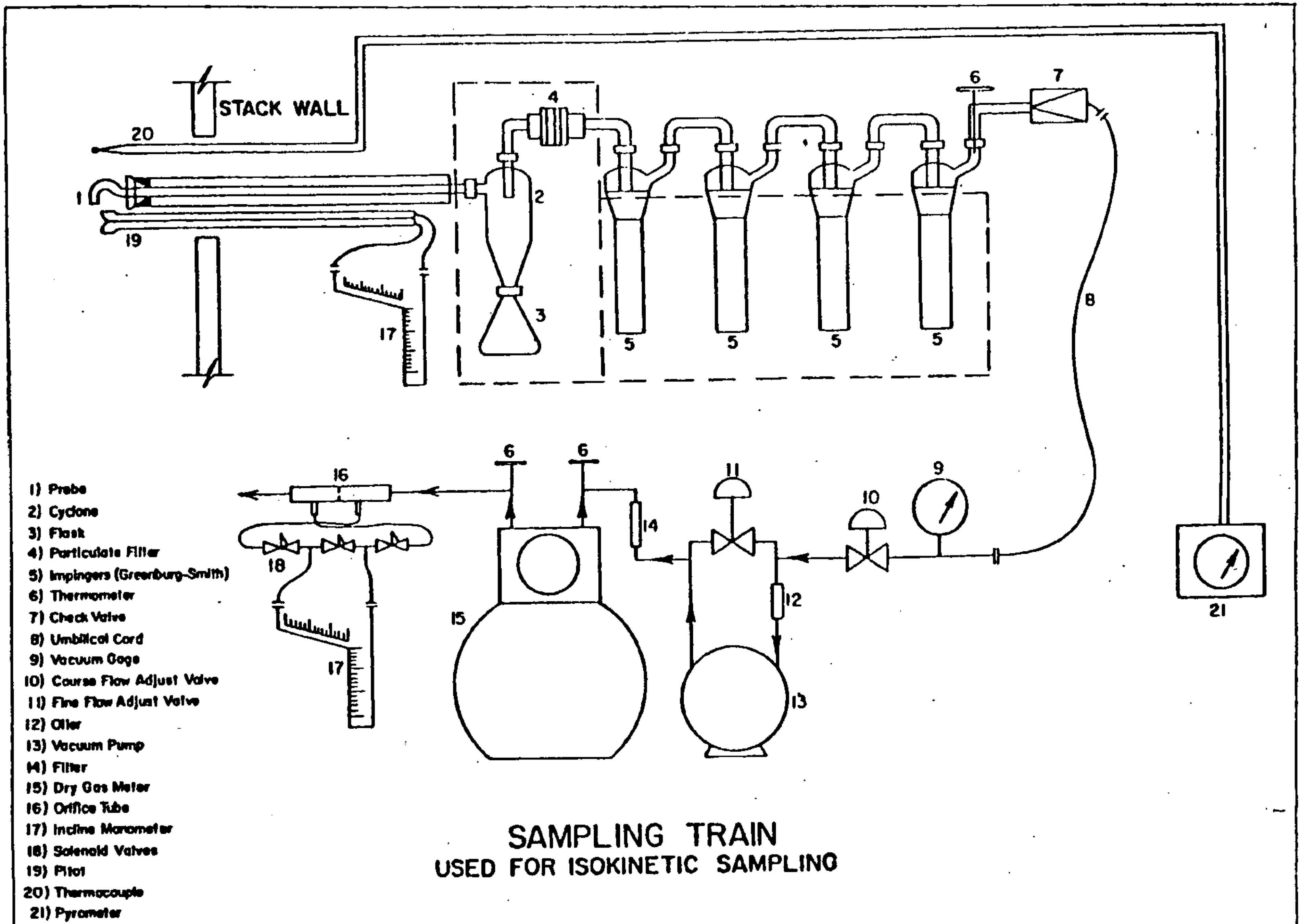
B. An Airguide Instruments Model 211-B (uncorrected) aneroid barometer for checking the barometric pressure.

C. Weston dial thermometers to check meter temperatures or an Analogic Model 2572 Digital Thermocouple to check stack temperatures.

D. A Hays 621 Analyzer to measure the oxygen, carbon dioxide and carbon monoxide content of the stack gases or, for non-combustion sources, a Bacharach Instrument Company Fyrite for gas analysis.

E. Schleicher and Schuell Type 1-HV filters with a porosity of .03 microns.

F. Reagent- or ACS-grade acetone with a residue of ≤ .001.



1) Probe
2) Cyclone
3) Flask
4) Particulate Filter
5) Impingers (Greenburg-Smith)
6) Thermometer
7) Check Valve
8) Umbilical Cord
9) Vacuum Gage
10) Course Flow Adjust Valve
11) Fine Flow Adjust Valve
12) Oiler
13) Vacuum Pump
14) Filter
15) Dry Gas Meter
16) Orifice Tube
17) Incline Manometer
18) Solenoid Valves
19) Pitot
20) Thermocouple
21) Pyrometer

SAMPLING TRAIN
USED FOR ISOKINETIC SAMPLING

LABORATORY PROCEDURES FOR PARTICULATE SAMPLING

I. Field Preparation

A. FILTERS: Fiberglass 4" sampling filters are prepared as follows:

Filters are removed from their box and numbered on the back side with a felt pen. The numbering system is continuous from job to job. The filters are placed in a desiccator to dry for at least 24 hours. Clean plastic petri dishes, also numbered, top and bottom, are placed in the desiccator with the filters. After desiccation, the filters are removed, one at a time, and weighed on the Sartorius analytical balance then placed in the correspondingly numbered petri dish. Weights are then recorded in the lab record books. Three filters are used for each complete particulate source emissions test and there should be several extra filters included as spares.

B. SILICA GEL: Silica Gel used for the test is prepared as follows:

Approximately 200 g of silica gel is placed in a wide mouth "Mason" type jar and dried in an oven at 175°C for two hours. The open jars are removed and placed in a desiccator until cool for two hours and then tightly sealed. The jars are then numbered and weighed on the triple beam balance to the closest tenth of a gram. This weight is recorded for each sealed jar. The number of silica gel jars used is the same as the number of filters. Silica gel should be indicating type, 6-16 mesh.

II. Post - Testing Lab Analysis

A. FILTERS: The filters are returned to the lab in their sealed petri dishes. In the lab, the dishes are opened and placed into a desiccator for at least 24 hours. Then the filters are weighed continuously every six hours until a constant weight is achieved. All data is recorded on the laboratory forms that will be bound in the test report.

B. SILICA GEL: The silica gel used in the stack test is returned to the appropriate mason jar and sealed for transport to the laboratory where it is reweighed to a constant weight on a triple beam balance to the nearest tenth of a gram.

C. PROBE RINSINGS: In all tests where a probe washout analysis is necessary, this is accomplished in accordance with procedures specified in "EPA Reference Method 5". These samples are returned to the lab in sealed mason jars for analysis. The front half of the filter holder is washed in accordance with the same procedures and included with the probe wash. Reagent or ACS grade acetone is used as the solvent. The backhalf of the filter holder is washed with deionized water into the impinger catch for appropriate analysis.

D. IMPINGER CATCH: In some testing cases, the liquid collected in the impingers must be analyzed for solid content. This involves a similar procedure to the probe wash solids determination, except that the liquid is deionized water.

E. ACETONE: A blank analysis of acetone is conducted from the one gallon glass container used in the field preparation. This acetone was used in the field for rinsing the probe, nozzle, and top half of the filter holder. A blank analysis is performed prior to testing on all new containers of acetone received from the manufacturer to insure that the quality of the acetone used will be exceed the .001% residual purity standard.

SPECIAL NOTE

When sampling sources high in moisture content, (such as asphalt plants) the filter paper sometimes sticks to the filter holder. When removing the filter, it may tear. In order to maintain control of any small pieces of filter paper which may be easily lost, they are washed with acetone into the probe washing. This makes the filter weight light (sometimes negative) and the probe wash correspondingly heavier. this laboratory procedure is taught by EPA in the "Quality Assurance for Source Emissions Workshop" at Research Triangle Park and is approved by EPA.

WEIGHING PROCEDURE - SARTORIUS ANALYTICAL BALANCE

The Sartorius balance is accurate to 0.1 mg and has a maximum capacity of 200 grams. The balance precision (standard deviation) is 0.05 mg. Before weighing an item, the balance should first be zeroed. This step should be taken before every series of weighings. To do this, the balance should have all weight adjustments at the "zero" position. The beam arrest lever (on the lower left hand side toward the rear of the balance) is then slowly pressed downward to the full release position. The lighted vernier scale on the front of the cabinet should align with the "zero" with the mark on the cabinet. If it is not so aligned, the adjustment knob on the right hand side (near the rear of the cabinet) should be turned carefully until the marks align. Now return the beam arrest to the horizontal arrest position. The balance is now "zeroed".

To weigh an item, it is first placed on the pan. And the sliding doors are closed to avoid air current disturbance. The weight adjustment knob on the right hand side must be at "zero". The beam arrest is then slowly turned upward. The lighted scale at the front of the cabinet will now indicate the weight of the item in grams. If the scale goes past the divided area, the item then exceeds 100 g weight (about 3-1/2 ounces) and it is necessary to arrest the balance (beam arrest lever) and move the lever for 100 g weight away from you. It is located on the left hand side of the cabinet near the front, and is the knob closest to the side of the cabinet. The balance will not weigh items greater than 200 grams in mass, and trying to do this might harm the balance. Remember, this is a delicate precision instrument.

After the beam is arrested in either weight range, the procedure is the same. When the weight of the item in grams is found, "dial in" that amount with the two knobs on the left hand side (near the 100 g lever) color coded yellow and green. As you dial the weight, the digits will appear on the front of the cabinet. When the proper amount is dialed, carefully move the arrest lever down with a slow, steady turn of the wrist. The lighted dial will appear, and the right hand side knob (front of cabinet) is turned to align the mark with the lower of the two lighted scale divisions which the mark appears between. when these marks are aligned, the two lighted digits along with the two indicated on the right hand window on the cabinet front are fractional weight in grams (the decimal would appear before the lighted digits) and the whole number of grams weight is the amount "dialed in" on the left.

In general, be sure that the beam is in "arrest" position before placing weight on or taking weight off of the pan. Don't "dial in" weight unless the beam is arrested. The balance is sensitive to even a hand on the table near the balance, so be careful and painstaking in every movement while weighing.

Form REC#8

SAMPLE ANALYTICAL DATA FORM

RM5 & 12

Company Name Valley #11

Sample Location Xenia, OHIO

Blank Volume (V_a) 100 ml

Date/Time wt. blank 9/27 8:00A

Date/Time wt. blank 9/27 2:00P

Relative Humidity in Lab 50 %

Density of Acetone (ρ_a) .7857 mg/ml

Gross wt. 104.1091 g

Gross wt. 104.1090 g

Ave. Gross wt. 104.1091 g

Tare wt. 104.1090 g

Weight of blank (m_{ab}) .0001 g

Acetone blank residue concentration (C_a) : (C_a) = (m_{ab}) / (V_a) (ρ_a) = (.000001 mg/g)

Acetone Blank Wt. : $W_a = C_a V_{aw} \rho_a$ = (.000001) (300) (.7857) = (.0002 g)

		Run # 1	Run # 2	Run # 3
Acetone rinse volume (V_{aw})	ml	300	300	300
Date/Time of wt. 9/27 8:00A Gross wt.	g	172.9324	168.9304	167.3410
Date/Time of wt. 9/27 2:00P Gross wt.	g	172.9321	168.9300	167.3408
Average Gross wt.	g	172.9323	168.9302	167.3409
Tare wt.	g	172.9144	168.9088	167.3017
Less Acetone blank wt. (W_a)	g	.0002	.0002	.0002
Weight of particulate in acetone rinse (m_a)	g	.0177	.0212	.0390

Filter Numbers	#	TS00482	TS00483	TS00484
Date/Time of wt. 9/27 8:00A Gross wt.	g	01.7104	01.6931	01.6844
Date/Time of wt. 9/27 2:00P Gross wt.	g	01.7105	01.6930	01.6842
Average Gross wt.	g	01.7105	01.6931	01.6843
Tare wt.	g	01.7080	01.6867	01.6823

Weight of particulate on filter (m_f)	g	.0025	.0064	.0019
Weight of particulate in acetone rinse (m_a)	g	.0177	.0212	.0390
Total weight of particulate (m_n)	g	.0202	.0276	.0409

NOTE: In no case should a blank residue greater than 0.01 mg/g (or 0.001% of the blank weight) be subtracted from the sample weight.

Remarks: Run 1 PW was washed first with .1N HNO_3 before acetone per observers instructions.

Signature of Analyst Thomas Smith

Signature of Reviewer

D:\DONNA\FORMS\LAB\SAMPLE.TBL

AMERICAN INTERPLEX
CORPORATION
LABORATORIES

8600 Kanis Road
Little Rock, AR 72204-2322
(501) 224-5060

Ramcon Environmental Corporation (C-488)
6707 Fletcher Creek Cove
Memphis, TN 38134

October 18, 1993

ATTN: Mr. Joe Sewell

Control No. 4293

Sample Description: Three (3) fuel oil, three (3) impinger solution, and three (3) filter received on 9/28/93
Re: Valley #11
P.O. No. 080611

Result:

Sample Identification	Lead mg/Kg
Fuel Oil Test 1	65
Fuel Oil Test 2	74
Fuel Oil Test 3	69

Sample Identification	Lead mg
Run 1	0.021
Run 2	<0.01
Run 3	<0.01

Method: EPA 3040, 6010A, 12

Enclosure: Analysis Protocol

AMERICAN INTERPLEX CORPORATION

By Steven Lovell
Steven Lovell
Technical Director

SL/tj

☐ Chemistry — Materials Science — Environmental Analyses

NAME: Valley Asphalt Corp., Plant #11
LOCATION: Xenia, Ohio

DATE: September 23, 1993

SUMMARY OF TEST DATA

			09-23-93	09-23-93	09-23-93
			Run #1	Run #2	Run #3
		start	08:31	10:17	12:42
		finish	09:36	11:53	13:47
	SAMPLING TRAIN DATA				
1.	Sampling time, minutes	Θ	60.00	60.00	60.00
2.	Sampling nozzle diameter, inches	D_n	0.275	0.275	0.275
3.	Sampling nozzle cross-section area, ft^2	A_n	0.000412	0.000412	0.000412
4.	Isokinetic variation	I	97.0	105.7	104.2
5.	Sample gas volume — meter condition, cf	V_m	45.037	46.823	43.831
6.	Average meter temperature, °R	T_m	534	538	539
7.	Average orifice pressure drop, inches H_2O	ΔH	2.02	2.08	1.87
8.	Total particulate collected, mg.	M_n	20.20	27.60	40.90
	VELOCITY TRAVERSE DATA				
9.	Stack area, ft^2	A	19.64	19.64	19.64
10.	Absolute stack gas pressure, inches Hg.	P_s	29.75	29.75	29.75
11.	Barometric pressure, inches Hg.	P_{bar}	29.75	29.75	29.75
12.	Average absolute stack temperature, R°	T_s	705	707	705
13.	Average √vel. head, (C_p = .84)	√dP	0.74	0.74	0.70
14.	Average stack gas velocity, ft/second	V_s	49.78	50.24	47.44
	STACK MOISTURE CONTENT				
15.	Total water collected by train, ml	V_{lc}	207.60	286.30	268.90
16.	Moisture in stack gas, percent (%)	B_{ws}	18.37	23.09	23.09
	EMISSIONS DATA				
17.	Stack gas flow rate, dscf/hr	Q_{sd}	2,138,987.7	2,028,176.5	1,920,574.2
18.	Stack gas flow rate, cfm	acfm	58,646	59,188	55,889
19.	Particulate concentration, gr/dscf	C_s	0.0071	0.0095	0.0150
20.	Particulate concentration, lb/hr	E	2.18	2.74	4.12
	ORSAT DATA				
21.	Percent CO_2 by volume	CO_2	2.9	3:4	3.7
22.	Percent O_2 by volume	O_2	14.2	15.6	15.1
23.	Percent CO by volume	CO	0.0	0.0	0.0
24.	Percent N_2 by volume	N_2	82.9	81.0	81.2

Format: summryR3/19-000

NAME: Valley Asphalt Corp., Plant #11 **DATE:** September 23, 1993
LOCATION: Xenia, Ohio

DRY GAS VOLUME

$$V_{m(std)} =$$

$$V_m \left[\frac{T_{(std)}}{T_m}\right] \left[\frac{P_{bar} + \frac{\Delta H}{13.6}}{P_{std}}\right] = 17.64 \, \frac{^\circ R}{\in .\ Hg} \, Y \, V_m \left[\frac{P_{bar} + \frac{\Delta H}{13.6}}{T_m}\right]$$

Where:

$V_{m(std)}$ - Dry gas volume through meter at standard conditions, ft^3.
V_m - Dry gas volume measured by meter, ft^3.
P_{bar} - Barometric pressure at orifice meter, in. Hg.
P_{std} - Standard absolute pressure, (29.92 in. Hg.).
T_m - Absolute temperature at meter, °R.
T_{std} - Standard absolute temperature, (528°R).
ΔH - Avg. pressure drop across orifice meter, in. H_2O.
Y - Dry gas meter calibration factor.
13.6 - Inches of water per Hg.

Run #1:

$$V_{m(std)} = (17.64)\ (0.979)\ (45.037) \left[\frac{(29.75) + \frac{2.02}{13.6}}{534}\right] = 43.547 \text{ dscf}$$

Run #2:

$$V_{m(std)} = (17.64)\ (0.980)\ (46.823) \left[\frac{(29.75) + \frac{2.08}{13.6}}{538}\right] = 44.976 \text{ dscf}$$

Run #3:

$$V_{m(std)} = (17.64)\ (0.979)\ (43.831) \left[\frac{(29.75) + \frac{1.87}{13.6}}{539}\right] = 41.972 \text{ dscf}$$

NAME: Valley Asphalt Corp., Plant #11
LOCATION: Xenia, Ohio

DATE: September 23, 1993

TOTAL CONTAMINANTS BY WEIGHT: GRAIN LOADING

Particulate Concentration: C_S gr/dscf

$$C_s = \left[0.0154\ \frac{gr}{mg}\right]\left[\frac{M_n}{V_{m(std)}}\right]$$

Where:

C_s = Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, gr/dscf.

M_n = Total amount of particulate matter collected, mg.

$V_{m(std)}$ = Dry gas volume through meter at standard conditions, cu. ft.

Run #1:

$$C_s = \left[0.0154\ \frac{gr}{mg}\right]\left[\frac{20.20}{43.547}\right] = 0.0071\ \text{gr/dscf}$$

Run #2:

$$C_s = \left[0.0154\ \frac{gr}{mg}\right]\left[\frac{27.60}{44.976}\right] = 0.0095\ \text{gr/dscf}$$

Run #3:

$$C_s = \left[0.0154\ \frac{gr}{mg}\right]\left[\frac{40.90}{41.972}\right] = 0.0150\ \text{gr/dscf}$$

NAME: Valley Asphalt Corp., Plant #11
LOCATION: Xenia, Ohio

DATE: September 23, 1993

TOTAL CONTAMINANTS BY WEIGHT: GRAIN LOADING

Lead Concentration: $C_s^{`}$ gr/dscf

$$C_s^{`} = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{M_n}{V_{m(std)}}\right]$$

Where:

$C_s^{`}$ - Concentration of lead in stack gas, dry basis, corrected to standard conditions, gr/dscf.

M_n - Total amount of lead matter collected, mg.

$V_{m(std)}$ - Dry gas volume through meter at standard conditions, cu. ft.

Run #1:

$$C_s^{`} = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{0.021}{43.547}\right] = 0.000007 \text{ gr/dscf}$$

Run #2:

$$C_s^{`} = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{<0.01}{44.976}\right] = <0.000003 \text{ gr/dscf}$$

Run #3:

$$C_s^{`} = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{<0.01}{41.972}\right] = <0.000004 \text{ gr/dscf}$$

NAME: Valley Asphalt Corp., Plant #11
LOCATION: Xenia, Ohio

DATE: September 23, 1993

DRY MOLECULAR WEIGHT

$$M_d = 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%CO + \%N_2)$$

Where:

M_d - Dry molecular weight, lb/lb-mole.
$\%CO_2$ - Percent carbon dioxide by volume, dry basis.
$\%O_2$ - Percent oxygen by volume, dry basis.
$\%N_2$ - Percent nitrogen by volume, dry basis.
$\%CO$ - Percent carbon monoxide by volume, dry basis.
0.264 - Ratio of O_2 to N_2 in air, v/v.
0.28 - Molecular weight of N_2 or CO, divided by 100.
0.32 - Molecular weight of O_2 divided by 100.
0.44 - Molecular weight of CO_2 divided by 100.

Run #1:

$$M_d = 0.44\ (2.9\%) + 0.32\ (14.2\%) + 0.28\ (.00\% + 82.9\%) = 29.03\ \frac{lb}{lb\text{-mole}}$$

Run #2:

$$M_d = 0.44\ (3.4\%) + 0.32\ (15.6\%) + 0.28\ (.00\% + 81.0\%) = 29.17\ \frac{lb}{lb\text{-mole}}$$

Run #3:

$$M_d = 0.44\ (3.7\%) + 0.32\ (15.1\%) + 0.28\ (.00\% + 81.2\%) = 29.20\ \frac{lb}{lb\text{-mole}}$$

NAME: Valley Asphalt Corp., Plant #11
LOCATION: Xenia, Ohio

DATE: September 23, 1993

WATER VAPOR CONDENSED

$$V_{wc_{std}} = [V_f - V_i] \left[\frac{P_w \; R \; T_{(std)}}{M_w \; P_{(std)}}\right] = 0.04707 \; [V_f - V_i]$$

$$V_{wsg_{std}} = [W_f - W_i] \left[\frac{R \; T_{(std)}}{M_w \; P_{(std)}}\right] = 0.04715 \; [W_f - W_i]$$

Where:

0.04707 = Conversion factor, ft^3/ml.
0.04715 = Conversion factor, ft^3/g.
Vwc_{std} = Volume of water vapor condensed (std. cond.), ml.
$Vwsg_{std}$ = Volume of water vapor collected in silica gel (standard conditions), ml.
$V_f - V_i$ = Final volume of impinger contents less initial volume, ml.
$W_f - W_i$ = Final weight of silica gel less initial weight, g.
P_w = Density of water, 0.002201 lb/ml.
R = Ideal gas constant, 21.85 in.Hg. (cu.ft./lb-mole)(°R).
M_w = Molecular weight of water vapor, 18.0 lb/lb-mole.
T_{std} = Absolute temperature at standard conditions, 528°R.
P_{std} = Absolute pressure at standard conditions, 29.92 inches Hg.

Run #1:

$$V_{wc(std)} = (0.04707) \; (\; 200.00 \;) = 9.4 \text{ cu. ft}$$
$$V_{wsg(std)} = (0.04715) \; (\; 7.60 \;) = 0.4 \text{ cu. ft}$$

Run #2:

$$V_{wc(std)} = (0.04707) \; (\; 280.00 \;) = 13.2 \text{ cu. ft}$$
$$V_{wsg(std)} = (0.04715) \; (\; 6.30 \;) = 0.3 \text{ cu. ft}$$

Run #3:

$$V_{wc(std)} = (0.04707) \; (\; 262.00 \;) = 12.3 \text{ cu. ft}$$
$$V_{wsg(std)} = (0.04715) \; (\; 6.90 \;) = 0.3 \text{ cu. ft}$$

Format: vaporR3/24-001

NAME: Valley Asphalt Corp., Plant #11
LOCATION: Xenia, Ohio

DATE: September 23, 1993

MOISTURE CONTENT OF STACK GASES

$$B_{ws} = \left[\frac{V_{wc_{std}} + V_{wsg_{std}}}{V_{wc_{std}} + V_{wsg_{std}} + V_{mstd}} \right] \times 100$$

Where:

B_{ws} - Proportion of water vapor, by volume, in the gas stream.

V_m - Dry gas volume measured by dry gas meter, dcf.

Vwc_{std} - Volume of water vapor condensed, corrected to standard conditions, scf.

$Vwsg_{std}$ - Volume of water vapor collected in silica gel corrected to std. cond., scf.

Run #1:

$$B_{ws} = \frac{9.4 + 0.4}{9.4 + 0.4 + 43.547} \times 100 = 18.37\ \%$$

Run #2:

$$B_{ws} = \frac{13.2 + 0.3}{13.2 + 0.3 + 44.976} \times 100 = 23.09\ \%$$

Run #3:

$$B_{ws} = \frac{12.3 + 0.3}{12.3 + 0.3 + 41.972} \times 100 = 23.09\ \%$$

Format: bwsR3/19-001

NAME: Valley Asphalt Corp., Plant #11 **DATE:** September 23, 1993
LOCATION: Xenia, Ohio

MOLECULAR WEIGHT OF STACK GASES

$$M_s = M_d (1 - B_{ws}) + 18 (B_{ws})$$

Where:

M_s = Molecular weight of stack gas, wet basis (lb./lb.-mole).

M_d = Molecular weight of stack gas, dry basis (lb./lb.-mole).

Run #1:

$$M_s = 29.03 (1 - 0.1837) + 18 (0.1837) = 27.00 \frac{lb}{lb\text{-}mole}$$

Run #2:

$$M_s = 29.17 (1 - 0.2309) + 18 (0.2309) = 26.59 \frac{lb}{lb\text{-}mole}$$

Run #3:

$$M_s = 29.20 (1 - 0.2309) + 18 (0.2309) = 26.61 \frac{lb}{lb\text{-}mole}$$

NAME: Valley Asphalt Corp., Plant #11
LOCATION: Xenia, Ohio

DATE: September 23, 1993

STACK GAS VELOCITY

$$V_s = K_p \ C_p \ [\sqrt{\Delta P}] \text{ avg} \ \sqrt{\frac{T_s(\text{avg})}{P_s \ M_s}}$$

Where:

V_s - Average velocity of gas stream in stack, ft/sec.
K_p - 85.49 ft/sec [(g/g-mole) — (mm Hg)/(°K)(mm H_2O)]$^{1/2}$
C_p - Pitot tube coefficient, dimensionless.
ΔP - Velocity head of stack gas, in. H_2O.
P_{bar} - Barometric pressure at measurement site, in. Hg.
P_g - Stack static pressure, in. Hg.
P_s - Absolute stack gas pressure, in. Hg. $= P_{bar} + P_g$
P_{std} - Standard absolute pressure, 29.92 in. Hg.
t_s - Stack temperature, °F.
T_s - Absolute stack temperature, °R. $= 460 + t_s$.
M_s - Molecular weight of stack gas, wet basis, lb/lb-mole.

Run #1:

$$V = (85.49) \ (0.84) \ (0.74) \ \sqrt{\frac{705}{(29.75) \ (27.00)}} = 49.78 \text{ ft/sec}$$

Run #2:

$$V = (85.49) \ (0.84) \ (0.74) \ \sqrt{\frac{707}{(29.75) \ (26.59)}} = 50.24 \text{ ft/sec}$$

Run #3:

$$V = (85.49) \ (0.84) \ (0.70) \ \sqrt{\frac{705}{(29.75) \ (26.61)}} = 47.44 \text{ ft/sec}$$

NAME: Valley Asphalt Corp., Plant #11
LOCATION: Xenia, Ohio

DATE: September 23, 1993

STACK GAS FLOW RATE

$$Q_{sd} = 3600 \left[1 - B_{ws} \right] V_s \; A \left[\frac{T_{std}}{T_{stk}} \right] \left[\frac{P_s}{P_{std}} \right]$$

Where:

Q_{sd} - Dry volumetric stack gas flow rate corrected to standard conditions (dscf/hr).
A - Cross sectional area of stack (ft^2).
3600 - Conversion factor (sec/hr).
T_{stk} - Absolute stack temperature (°R).
T_{std} - Standard absolute temperature (528°R).
P_{bar} - Barometric pressure at measurement site (in. Hg.).
P_g - Stack static pressure (in. Hg.).
P_s - Absolute stack gas pressure (in. Hg.) - $P_{bar} + P_g$
P_{std} - Standard absolute pressure (29.92 in. Hg.).

Run #1: Q_{sd} =

$$3600 \; (1 - 0.1837) \; (49.78) \; (19.64) \left[\frac{528}{705} \right] \left[\frac{29.75}{29.92} \right] = 2{,}138{,}987.7 \; \frac{dscf}{hr}$$

Run #2: Q_{sd} =

$$3600 \; (1 - 0.2309) \; (50.24) \; (19.64) \left[\frac{528}{707} \right] \left[\frac{29.75}{29.92} \right] = 2{,}028{,}176.5 \; \frac{dscf}{hr}$$

Run #3: Q_{sd} =

$$3600 \; (1 - 0.2309) \; (47.44) \; (19.64) \left[\frac{528}{705} \right] \left[\frac{29.75}{29.92} \right] = 1{,}920{,}574.2 \; \frac{dscf}{hr}$$

NAME: Valley Asphalt Corp., Plant #11
LOCATION: Xenia, Ohio

DATE: September 23, 1993

EMISSIONS RATE FROM STACK

$$E = \left[\frac{(C_s)\quad(Q_{sd})}{7{,}000\ \mathrm{gr/lb}}\right] = \mathrm{lb/hr}$$

Where:

E = Emissions rate, lbs/hr.

C_s = Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, gr/dscf.

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

Run #1:

$$E = \frac{(0.0071)\quad(2{,}138{,}987.7)}{7000} = \mathbf{2.18\ lb/hr}$$

Run #2:

$$E = \frac{(0.0095)\quad(2{,}028{,}176.5)}{7000} = \mathbf{2.74\ lb/hr}$$

Run #3:

$$E = \frac{(0.0150)\quad(1{,}920{,}574.2)}{7000} = \mathbf{4.12\ lb/hr}$$

NAME: Valley Asphalt Corp., Plant #11
LOCATION: Xenia, Ohio

DATE: September 23, 1993

LEAD EMISSIONS RATE FROM STACK

$$E = \left[\frac{(C_s^{`})\ \ (Q_{sd})}{7{,}000\ \text{gr/lb}}\right]$$

Where:

E - Emissions rate, lbs/hr.

$C_s^{`}$ - Concentration of lead in stack gas, dry basis, corrected to standard conditions, gr/dscf.

Q_{sd} - Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

Run #1:

$$\mathbf{E = \frac{(0.000007)\ \_\_\_\_\ (2{,}138{,}987.7)}{7{,}000} = 0.0021\ lb/hr}$$

Run #2:

$$\mathbf{E = \frac{(<0.000003)\ \_\_\ (2{,}028{,}176.5)}{7{,}000} = <0.0009\ lb/hr}$$

Run #3:

$$\mathbf{E = \frac{(<0.000004)\ \_\_\ (1{,}920{,}574.2)}{7{,}000} = <0.0011\ lb/hr}$$

NAME: Valley Asphalt Corp., Plant #11 **DATE:** September 23, 1993
LOCATION: Xenia, Ohio

ISOKINETIC VARIATION

$$I = 100\ T_s \left[\frac{(0.002669)\ (V_{ic} + \left(\frac{Y_i\ V_m}{T_m} \right) (P_{bar} + \Delta H/13.6)}{60\quad \theta\quad V_s\quad P_s\quad A_n} \right]$$

Where:

I - Percent isokinetic sampling.
100 - Conversion to percent.
T_s - Absolute average stack gas temperature, °R.
0.002669 - Conversion factor, Hg - ft³/ml - °R.
V_{ic} = Total volume of liquid collected in impingers and silica gel, ml.
T_m = Absolute average dry gas meter temperature, °R.
P_{bar} - Barometric pressure at sampling site, in. Hg.
ΔH - Average pressure differential across the orifice meter, in. H_2O.
13.6 - Specific gravity of mercury.
60 - Conversion seconds to minutes.
Θ - Total sampling time, minutes.
V_s - Stack gas velocity, ft/sec.
P_s - Absolute stack gas pressure, in. Hg.
A_n - Cross sectional area of nozzle, ft².
Y_i - Calibration factor.

Run #1:

$$I = (100)\ (705) \left[\frac{(0.002669)\ (207.60) + \frac{(0.979)\ (45.037)}{534} \left[29.75 + \frac{2.02}{13.6} \right]}{60\quad (\ 60.00\ )\quad (\ 49.78\ )\quad (\ 29.75\ )\quad (\ 0.000412\ )} \right] = 97.0\%$$

Run #2:

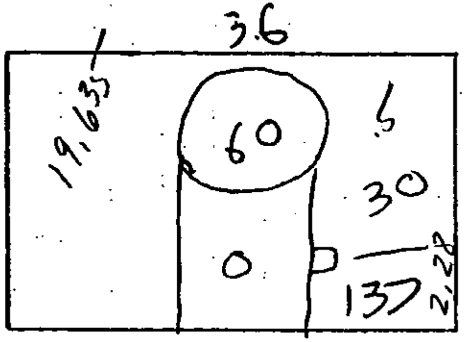
$$I = (100)\ (707) \left[\frac{(0.002669)\ (286.30) + \frac{(0.980)\ (46.823)}{538} \left[29.75 + \frac{2.08}{13.6} \right]}{60\quad (\ 60.00\ )\quad (\ 50.24\ )\quad (\ 29.75\ )\quad (\ 0.000412\ )} \right] = 105.7\%$$

Run #3:

$$I = (100)\ (707) \left[\frac{(0.002669)\ (268.90) + \frac{(0.979)\ (43.831)}{539} \left[29.75 + \frac{1.87}{13.6} \right]}{60\quad (\ 60.00\ )\quad (\ 47.44\ )\quad (\ 29.75\ )\quad (\ 0.000412\ )} \right] = 104.2\%$$

RAMCON ENVIRONMENTAL CORPORATION

Plant Valley/ # 11
Location Xenia Ohio
Operator Allen Jones
Date 9-23-93
Run No. 1
Sample Box No. 1
Meter Box No. Autech 2
Meter H @ 1.941
C Factor .979
Pitot Tube Coefficient Cp .84



Schematic of Stack Cross Section

Ambient Temperature 60
Barometric Pressure 29.75
Assumed Moisture, % 18
Probe Length, m(ft) 6 ft
Nozzle Identification No. .0004124
Avg. Calibrated Nozzle Dia., (in.) .275/.275/.275
Probe Heater Setting Low
Leak Rate, m³/min.(cfm) .001 at 10 in Hg
Probe Liner Material Stainless steel
Static Pressure, mm Hg(in.Hg) +.01
Filter No. TS-00482

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	400	427.4
INITIAL	200	419.8
DIFFERENCE	200	7.6

TRAV. PT NO.	SAMPLING TIME (θ)min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H20	PRESSURE DIFF. ORF. MTR in H20	GAS SAMPLE VOLUME ft³	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
1	9:31 / 8:33:30	5	244	.52	1.9	458.5 / 459.9	69	68	254	53
2	8:36	5	244	.52	1.9	461.2	68	67	254	53
3	8:38:30	5	244	.52	1.9	463.1	68	67	253	53
4	8:41	5	248	.54	1.9	464.9	69	67	245	53
5	8:43:30	5	248	.54	1.9	467.0	70	67	245	54
6	8:46	5	248	.52	1.9	468.7	70	67	247	54
7	8:48:30	5	248	.60	2.2	471.0	70	67	248	54
8	8:51	5	248	.63	2.3	472.7	76	68	245	54
9	8:53:30	5	243	.63	2.3	474.8	76	68	249	55
10	8:56	5	245	.63	2.3	476.8	78	69	256	56
11	8:58:30	5	245	.65	2.3	478.9	80	69	248	55
12	9:01	4	246	.48	1.7	481.0	80	69	248	55
1	9:06 / 9:08:30	5	248	.65	2.3	482.4	80	69	252	55

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 9-23-92 LOCATION Xenia Ohio TEST NO. 1

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM ~~mm~~ Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft^3)	GAS SAMPLE TEMP. (°F)		SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
							in	out		
2	9:11	6	248	.68	2.4	484.6	79	71	266	58
3	9:13-30	5	247	.63	2.3	486.5	78	71	260	58
4	9:16	5	241	.63	2.3	488.6	80	71	244	58
5	9:18:30	5	241	.63	2.3	490.6	84	75	244	58
6	9:21	5	240	.60	2.2	492.7	82	72	256	58
7	9:23-30	5	240	.52	1.9	494.6	82	72	256	58
8	9:26	5	240	.52	1.9	496.4	83	73	247	60
9	9:28:30	4	245	.46	1.7	498.3	83	73	251	60
10	9:31	4	246	.46	1.7	499.9	83	73	255	60
11	9:33:30	4	248	.44	1.6	501.7	83	73	249	60
12	9:36	4	248	.40	1.4	503.537	84	74	249	60

RAMCON ENVIRONMENTAL CORPORATION

3.78

Plant Valley #11
Location Xenia Ohio
Operator Allen Irwin
Date 9-23-93
Run No. 2
Sample Box No. 1
Meter Box No. Nutech 2
Meter H @ 1.941
C Factor .929
Pitot Tube Coefficient Cp .929 at .84

Ambient Temperature 65
Barometric Pressure 29.75
Assumed Moisture, % 18
Probe Length, m(ft) 6 ft
Nozzle Identification No. 0004124
Avg. Calibrated Nozzle Dia., (in.) .275/.275/.275
Probe Heater Setting low
Leak Rate, m3/min. (cfm) .002 at 12 in
Probe Liner Material stainless steel
Static Pressure, mm Hg (in. Hg) +.01
Filter No. 75-00483

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	480	458.2
INITIAL	200	451.9
DIFFERENCE	280	6.3

Schematic of Stack Cross Section

TRAV. PT NO.	SAMPLING TIME (θ)min.	VACUUM in. Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (Ps) in H20	PRESSURE DIFF. ORF. MTR in H20	GAS SAMPLE VOLUME ft3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	GAS SAMPLE TEMP. AT DRY GAS METER °F Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
1	10:47:30 / 10:50	5	245	.70	2.6	503.7 / 505.9	74	73	256	63
2	10:52-30	5	248	.70	2.6	508.0	74	73	256	61
3	10:55	5	247	.65	2.5	509.8	76	74	255	61
4	10:57-30	5	248	.65	2.5	512.2	75	73	254	61
5	11:00	5	248	.65	2.5	514.7	75	73	254	61
6	11:02-30	4	251	.55	2.1	512.0	78	73	254	63
7	11:05	4	243	.55	2.1	518.3	80	74	253	60
8	11:07-30	4	243	.55	2.1	520.4	80	74	253	60
9	11:10	4	248	.52	2.0	522.3	80	74	253	60
10	11:12-30	4	253	.50	1.9	524.1	83	75	253	60
11	11:15	4	253	.45	1.7	525.9	83	75	253	58
12	11:17-30	4	251	.38	1.4	527.8	84	75	248	53
1	11:22:30 / 11:25	4	249	.55	2.1	529.5	80	75	250	53

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 9-23-93 LOCATION Xenia [illegible] TEST NO. 2

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft^3)	GAS SAMPLE TEMP. (°F)		SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
							in	out		
2	11:22-30	5	254	.48	1.8	531.4	.82	75	246	60
3	11:30	5	254	.48	1.8	534.2	.82	75	246	60
4	11:32-30	5	254	.50	1.9	535.1	82	75	246	60
5	11:35	5	253	.54	2.0	532.1	82	75	246	60
6	11:37-30	5	253	.54	2.0	539.0	.88	80	237	61
7	11:40	5	254	.60	2.3	540.8	.87	.77	240	61
8	11:42-30	5	254	.65	2.5	543.7	.88	77	238	61
9	11:45	5	254	.65	2.5	544.9	.88	.72	243	61
10	11:47-30	5	254	.50	1.9	546.9	.87	.77	250	61
11	11:50	5	254	.40	1.5	548.7	.87	78	250	61
12	11:52-30	5	254	.40	1.5	550.623	.87	78	250	63

RAMCON ENVIRONMENTAL CORPORATION

3.78

Plant Valley # 11
Location Xenia Ohio
Operator Allen Turner
Date 9-23-93
Run No. 3
Sample Box No. 1
Meter Box No. Nutech 2
Meter H @ 1.941
C Factor .979
Pitot Tube Coefficient Cp .84

Ambient Temperature 65
Barometric Pressure 29.75
Assumed Moisture, % 18
Probe Length, m(ft) 6 ft
Nozzle Identification No. .0004124
Avg. Calibrated Nozzle Dia., (in.) .225/.225/.225
Probe Heater Setting Dass
Leak Rate, m³/min. (cfm) .015 at 10 in Hg
Probe Liner Material Stainless steel
Static Pressure, mm Hg (in. Hg) +.01
Filter No. TS-00484

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	462	398.3
INITIAL	200	391.4
DIFFERENCE	262	6.9

Schematic of Stack Cross Section

TRAV. PT NO.	SAMPLING TIME (θ)min.	VACUUM in. Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (Ps) in H20	PRESSURE DIFF. ORF. MTR in H20	GAS SAMPLE VOLUME ft³	GAS SAMPLE TEMP. AT DRY GAS METER °F		FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
							Inlet	Outlet		
1	12:42:30 12:45	4	245	.22	.84	550.9 552.0	75	75	225	60
2	12:48-30	4	245	.35	1.3	553.3	78	75	229	60
3	12:50	4	245	.35	1.3	555.2	78	77	229	60
4	12:52-30	4	248	.35	1.3	557.0	28	77	249	60
5	12:55	4	247	.35	1.3	558.3	78	75	250	60
6	12:58-30	4	243	.35	1.3	559.9	80	75	250	60
7	1:00	4	243	.50	1.9	561.5	80	75	248	63
8	1:02-30	4	243	.50	1.9	563.3	80	75	252	64
9	1:05	4	243	.60	2.3	565.3	80	75	252	64
10	1:07-30	4	248	.60	2.3	567.2	80	75	252	63
11	1:10	4	248	.60	2.3	569.2	80	75	252	64
12	1:12-30	4	248	.60	2.3	571.4	81	75	253	65
1	1:17 1:19-30	4	248	.65	2.5	573.5	80	75	248	63

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 9-23-93 LOCATION ~~9-23-93~~ Xinta Chie TEST NO. 3

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft^3)	GAS SAMPLE TEMP. (°F)		SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
							in	out		
2	1:22	5	240	.47	1.9	575.6	82	76	225	60
3	1:24-30	5	240	.50	1.9	577.7	82	76	225	60
4	1:27	5	240	.50	1.9	579.4	82	76	225	60
5	1:29-30	5	240	.50	1.9	581.5	82	76	228	60
6	1:32	5	241	.50	1.9	583.0	82	76	229	60
7	1:34-30	5	243	.45	1.7	584.7	85	76	231	60
8	1:37	5	244	.50	1.9	586.5	85	76	234	63
9	1:39-30	5	248	.62	2.3	588.9	90	80	245	65
10	1:42	5	250	.62	2.3	590.5	90	80	245	64
11	1:44-30	5	250	.62	2.3	592.6	90	80	261	63
12	1:47	5	250	.55	2.1	594.731	90	80	261	63

Valley # 11
Company Name

9-23-93
Date

REFERENCE METHOD 3: GAS ANALYSIS BY FYRITE

FUEL	F_o FACTORS
WOOD	1.0540
BARK	1.0830
ANTHRACITE	1.0699
BITUMINOUS	1.1398
LIGNITE	1.0761
OIL	1.3465
GAS	1.7489
PROPANE	1.5095
BUTANE	1.4791

$$O_2\% = 20.9 - [F_o \times CO_2\%]$$

RUN #1: ____ = 20.9 - [____ x ____]

RUN #2: ____ = 20.9 - [____ x ____]

RUN #3 ____ = 20.9 - [____ x ____]

RUN 1:	CO_{2X}	3.0	CO_{2X}	2.8	CO_{2X}	2.8	AVG.	
	O_{2X}	14.0	O_{2X}	14.4	O_{2X}	14.2	AVG.	
	N_{2X}		N_{2X}		N_{2X}		AVG.	
RUN 2:	CO_{2X}	3.0	CO_{2X}	3.6	CO_{2X}	36	AVG.	
	O_{2X}	15.5	O_{2X}	15.4	O_{2X}	16.0	AVG.	
	N_{2X}		N_{2X}		N_{2X}		AVG.	
RUN 3:	CO_{2X}	3.6	CO_{2X}	3.8	CO_{2X}	3.8	AVG.	
	O_{2X}	15.0	O_{2X}	15.2	O_{2X}	15.0	AVG.	
	N_{2X}		N_{2X}		N_{2X}		AVG.	

4A

TYPE S PITOT TUBE INSPECTION DATA FORM

Pitot tube assembly level? [✓ yes] ______ no

Pitot tube openings damaged? ____ yes (explain below) [✓ no]

α_1 = 1.3 ° (<10°), α_2 = 0.8 ° (<10°), β_1 = 0.5 ° (<5°), β_2 = 1.8 ° (<5°)

γ = 2.9 °, θ = 1.7 °, A = .97 cm (in.)

$z = A \sin \gamma$ = .05 cm (in.); <0.32 cm (<1/8 in.),

$w = A \sin \theta$ = .03 cm (in.); <.08 cm (<1/32 in.)

P_A .48 cm (in.) P_b .49 cm (in.)

D_t = .38 cm (in.)

Comments: ______

Calibration required? ____ yes [✓ no]

TYPE S PITOT TUBE INSPECTION DATA FORM

Pitot tube assembly level? ✓ yes ______ no

Pitot tube openings damaged? ______ yes (explain below) ______ no

α_1 = 2.3° (<10°), α_2 = .5° (<10°), β_1 = 1.8° (<5°),
β_2 = 1.8° (<5°)

γ = 3.2°, θ = 1.0°, A = .98 cm (in.)

$z = A \sin \gamma$ = .05 cm (in.); <0.32 cm (<1/8 in.),
$w = A \sin \theta$ = .02 cm (in.); <.08 cm (<1/32 in.)

P_A .49 cm (in.) P_b .49 cm (in.)

D_t = .38 cm (in.)

Comments: ______

Calibration required? ______ yes ✓ no

RAMCON

Lear Siegler Stack Sampler

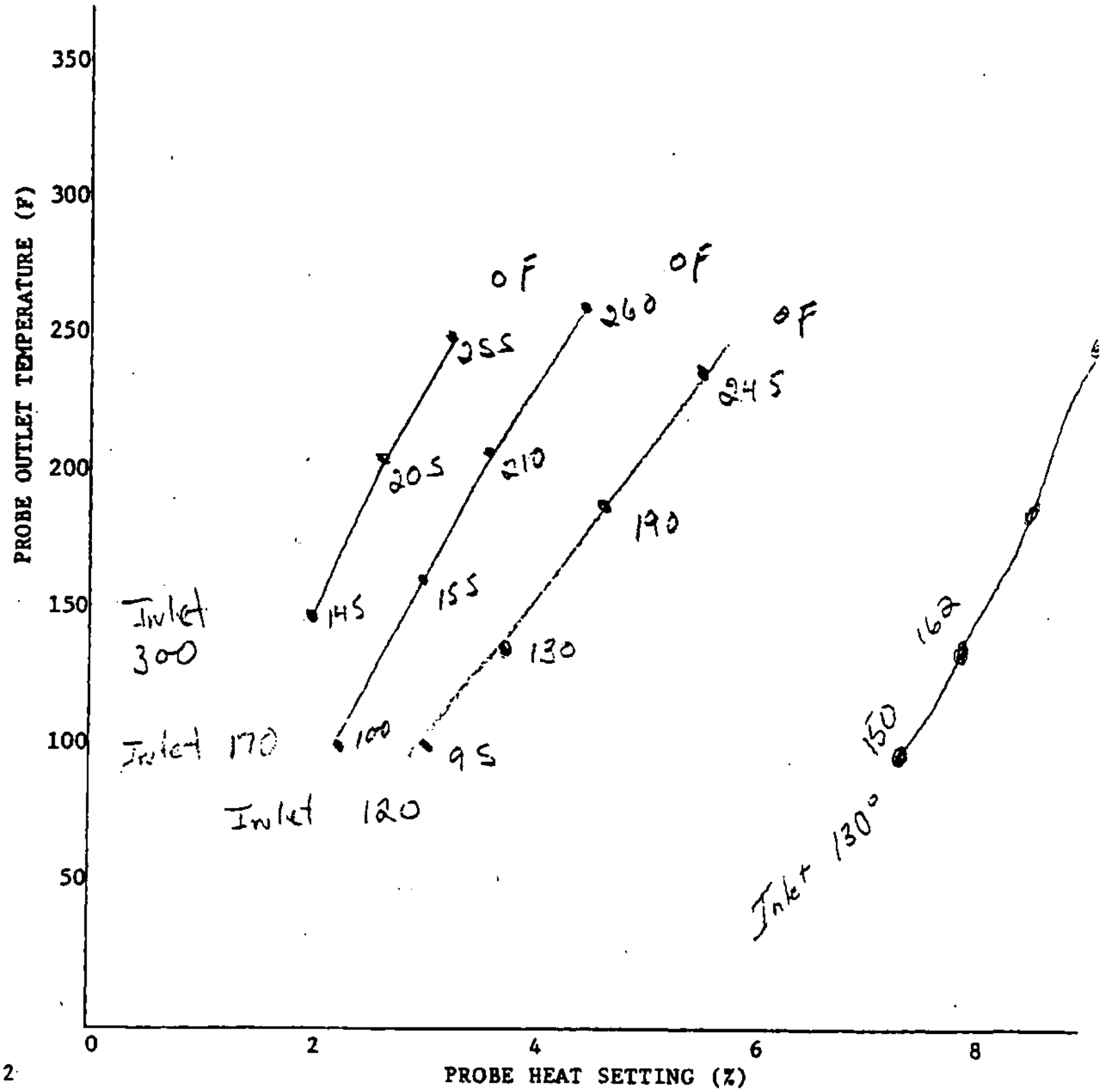
Heating Probe Calibration

Probe No. 64 Probe Length 6'

Date of Calibration 5-7-90 Signature Sam

Name of Company to be tested __________

Note: 3 ft. probe - 5 min. warmup
6 ft. probe - 15 min. warmup
10 ft. probe - 30 min. warmup
Calibration flow rate = .75 CFM



Form No. EED-17-2

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date 5-5-90 Thermocouple number 64

Ambient temperature 20 °C Barometric pressure 29.88 in. Hg

Calibrator S Tuma Reference: mercury-in-glass ✓

other ____

Reference point number	Source[a] (specify)	Reference thermometer temperature, °C	Thermocouple potentiometer temperature, °C	Temperature difference,[b] %
A	Ice Bath	32	32	0
B	Boiling water	212	211	.005
C	Boiling oil	381	378	.008
D	Ambient			

[a] Type of calibration system used.

[b] $$\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \leq 1.5\%.$$

Quality Assurance Handbook M5-2.5

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English Units)

Test No. ______ Date 9-29-93 Meter Box No. Nutech 2 Plant No. ______

Barometric Pressure P_b = 30.50 in.Hg Dry Gas Meter No. ______ Pretest Y ______

	Orifice Manometer Setting (ΔH),	Gas Volume		Temperature				Time (Θ)	Vacuum Setting	Y_i	$Y_i = \frac{V_w \ P_b \ (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$ 534
		Wet Test Meter (V_w)	Dry Gas Meter (V_d)	Wet Test Meter (t_w)	Dry Gas Meter						
					Inlet (t_{d_i})	Outlet (t_{d_o})	Avg.† (t_d)				
	in. H_2O	ft³	ft³	°F	°F	°F	°F	min	in. Hg		
9.775	3.0	10	734.800 744.793	74	72 79	69 69	735	10.28		993	Ota 1.94
10.046	2.0	10	744.819 754.865	74	80 86	70 73	7725	331		997	1.95
9.098	1.0	10	755.1 770.198	74	93 87	75 76	80.25	9.17		.990	1.85 ota 1.91
										Y = .993	

† If there is only one thermometer on the dry gas meter, record the temperature under t_d where:

V_w = Gas volume passing through the wet test meter, ft³.
V_d = Gas volume passing through the dry gas meter, ft³.
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.
ΔH = 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.
Θ = Time of calibration run, minutes.

POSTTEST DRY GAS METER CALIB.ATION DATA FORM (English Units)

Test No. ________ Date 9-7-93 Meter Box No. NuTech 2 Plant No. ________

Barometric Pressure P_b = 30.12 in.Hg Dry Gas Meter No. ________

Pretest Y ________

.259
.307
11.442

Orifice Manometer Setting (ΔH), in. H_2O	Gas Volume		Temperature				Time (Θ) min	Vacuum Setting in. Hg	Y_i	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
	Wet Test Meter (V_w) ft³	Dry Gas Meter (V_d) ft³	Wet Test Meter (t_w) °F	Dry Gas Meter Inlet (t_{d_i}) °F	Dry Gas Meter Outlet (t_{d_o}) °F	Dry Gas Meter Avg.† (t_d) °F				
1.0	~~10~~ 5	22.424 27.683	<62	95 97	87 89	92	9.22	2	.969	1.905
2.0	10	28.083 38.390	<62	95 100	89 91	94	13.15	3	.992	1.930
3.0	~~10~~ 11	10.623 22.065	<62	91 99	85 86	90	11.8	3	.976	1.941
									Y = .979	1.941

† If there is only one thermometer on the dry gas meter, record the temperature under t_d where:

V_w = Gas volume passing through the wet test meter, ft³.
V_d = Gas volume passing through the dry gas meter, ft³.
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.
ΔH = 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.
Θ = Time of calibration run, minutes.

Name: Mr. Sumner Buck
Title: President

Qualifications: Mr. Buck is a graduate of the University of Mississippi with graduate studies at Memphis State University and State Technical Institute of Memphis. He is a graduate of the EPA 450 "Source Sampling for Particulate Pollutant's" course and the 474 "Continuous Emissions Monitoring" courses outlined by EPA at Research Triangle Park, N.C. He has been directly involved in conducting and supervising air emission testing for over 15 years. He has personally conducted over 400 air emission tests. He currently sponsors and directs visual emission certification schools for US EPA Method 9.

Project Duties: Mr. Buck is responsible for the overall supervision of each testing project. This includes the correspondence to the State Regulatory Agency and the plant personnel regarding scheduling, testing requirements, etc. He will assist in supervision of the project preparation for each team involved and the overall organization between the testing crew(s) and facility.

Name: Mr. Joe Sewell
Title: Vice President

Qualifications: Mr. Sewell is currently serving as the Vice President of RAMCON Environmental Corporation. Mr. Sewell is a graduate of Christian Brothers University in Memphis, Tennessee where he obtained a Bachelor of Science degree in Chemical Engineering. He has conducted and supervised air emissions testing projects ranging a broad spectrum of facility process categories. His accomplishments include the development of the instrumental branch of emissions testing utilizing continuous emission monitors and gas chromatography. Mr. Sewell performs a major role in the upgrading of testing capabilities and professional quality that RAMCON Environmental Corporation offers.

Project Duties: Mr. Sewell provides staff engineering and project administration to ensure the integrity of the requested services. He serves as the primary contact person for RAMCON Environmental Corporation handling all correspondence between the facility personnel involved in the project and respective state agency representative(s). He provides project leadership to RAMCON Environmental Corporation field supervisors and managers involved in the testing project.

Name: Mr. Ray Jenkins
Title: Source Sampling Director

Qualifications: Mr. Jenkins is serving as the Source Sampling Director for RAMCON Environmental Corporation. He was promoted to this leadership position after gaining a significant amount of experience in conducting and providing field supervision of a variety of air testing projects. Mr. Jenkins has personally conducted and/or supervised all of the prevalent EPA approved procedures with expertise in the instrumental analyzer procedures. He graduated from Memphis State University obtaining a Bachelor of Science degree in Biology. He is also currently certified to conduct US EPA Reference Method 9 for the visual determination of emission opacity.

Project Duties: Mr. Jenkins provides project leadership to the Team Leaders and Field Technicians. He ensures the test crew(s) involved in the test project will be properly informed to his respective duties and responsibilities during the testing process. Mr. Jenkins also serves as the Quality Assurance/Quality Control Coordinator and provides guidance in QA/QC to each Team Leader with regard to sample integrity.

Name: Mr. Tommy South
Title: Laboratory Technician

Qualifications: Mr. South is currently serving as Laboratory Technician. He is proficient in conducting many analysis procedures such as front and back-half particulate analysis, titrations, extractions, etc.

Project Duties: Mr. South conducts the laboratory analysis on the particulate samples. He is also responsible for accepting the remaining field samples from the Field Sample Bank

Manager and performing inspection as to integrity. He documents the transfer on the chain of custody forms and distributed the subcontracted samples to the respective laboratories.

Name: Mr. Allen Turner
Title: Team Leader

Qualifications: Mr. Turner has been employed with RAMCON Environmental Corporation for five years. Altogether, he has sampled approximately 300 stacks of all types. Mr. Turner became qualified for a Team Leader in 1988 and has served as such since that time. He is a current V.E. reader and continues his studies at State Technical Institute in Memphis, Tennessee. Mr. Turner has extensive experience in EPA Methods 1-9.

Project Duties: Mr. Turner is responsible for isokinetic sampling procedures, including but not limited to, Method 5 for particulate, multi-metals, PAH, calibration and cleaning of necessary equipment for his testing. His duties on-site include assembling the sample train, leak checking the system, operation of the train and recording the test data on the field data forms.