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.

APPENDIX K

OEPA STACK TEST REVIEW SUMMARY FORM

APPLICATION NUMBER 17077990112

FACILITY NAME P901

SOURCE DESCRIPTION (OR SCC CODE) ADECO Model 5426 Dryer Drum Hot Mix Asphalt Plant

CONTROL EQUIPMENT Spray Chamber / Venturi Scrubber

DATE(S) OF TEST June 15, 1993

FINAL TEST REPORT RECEIVED ON 12-8-93

POLLUTANT(S) TESTED Particulater

TEST METHOD TRA Det Laboratories, Inc.

TEST FIRM method 1-5

EMISSION RATES*:

ACTUAL (lb(s)/hr) 0.037 Ave. ALLOWABLE** .04 gr/DSCF

OPERATING RATES*:

DURING TEST** 49.7 MAXIMUM** 60 (From Previous form)

EMISSION FACTOR*** Controled 0.04 #/Ton, Uncontrolled 4.9 #/Ton AP-42

COMMENTS: PTO Recomended

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;

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

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

12-9-93
DATE OF REVIEW

David W. Bobb
REVIEWED BY

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

TRA-DET INC.
COAL TECHNICAL SERVICES

P.O. BOX 2019
WHEELING, WV 26003
(304) 547-9094
FAX 304-547-9097

SHIPPING ADDRESS
BATTLE RUN ROAD
RD 2, BOX 227A
TRIADELPHIA, WV 26059

Rec'd 12/8/93

December 6, 1993

Mr. Harold Strohmeyer
Northern Ohio Valley Air Authority
814 Adams Street
Steubenville, OH 43952

Dear Mr. Strohmeyer:

Enclosed for your review and records is the report on the particulate emissions test conducted at the Wilson Blacktop Company.

Should you have any questions or need additional information please contact this office.

Sincerely,

Richard P. Whitt

RPW:rd

Enclosure

cc: Mr. Dennis Wilson
w/enclosure

Rec'd
12/13/93

PARTICULATE EMISSION TEST
WILSON BLACKTOP COMPANY
MARTINS FERRY, OHIO

By

TraDet, Inc.
P. O. Box 2019
Wheeling, West Virginia 26003
(304) 547-9094

December 1993

OHIO EPA

PERFORMANCE OF AIR PERMIT REPORTING REQUIREMENTS

WILSON BLACKTOP CORPORATION

1 7 0 7 0 9 0 1 1 2 P 9 0 1	90 / 12 / 11	03	93 / 07 / 11
APPLICATION NUMBER	EFFECTIVE DATE	TYPE	DATE REQUIRED

<<

PROCESS DESCRIPTION

The facility tested is an Adeco Model 5426 asphalt plant owned and operated by Wilson Blacktop Company, Martins Ferry, Ohio. The facility is located in the Martins Ferry Industrial Park adjacent to the Ohio River. The unit is designed to produce 50-60 TPH of hot asphalt mix. The typical production process includes heating a mixture of 46% sand, 48% gravel, and AC-20 asphalt bitum in a natural gas fired rotary kiln. The product mix is conveyed from the discharge end of the rotary kiln to a 50 ton capacity bin which also serves as the truck loadout facility.

The emissions from the operation consists of combustion by-products and any fine particulate (sand/gravel) that has become entrained in the heated air stream. Combustion air for the natural gas is added at the feed end of the rotary kiln by means of a 15 horsepower blower. The air/fuel moisture is fed through a Hauck Flame Jet Burner and ignited inside the rotary kiln. An induced fan removes combustion gases by pulling them through a venturi scrubber and a horizontal, tangentially fed circular mist eliminator. The scrubber consists of a series of nozzles ahead of the venturi plate and utilizes approximately 50 gpm of water. The water exits the system through the bottom of the mist eliminator and is recirculated through two settling basins before being reused in the scrubber. Fresh make-up water is added to the closed circuit to compensate for evaporative water loss in the scrubber system. The saturated gas stream exits the system through the induced fan and out the rectangular stack. The facility is designed for a 4,500 ACFM air flow at 160°F.

EQUIPMENT - The equipment utilized for the particulate emission test included a Research Appliance Company, Model 2343, stacksampler train with a

combination heated stainless steel probe and S-type pitot tubes, and the associated glassware. The equipment to be utilized is shown schematically in Figure 1. Pre and post test calibration data of the equipment is included in the appendix.

PROCEDURE - After allowing 30 minutes for stabilization of the asphalt dryer mix plant after start-up, the emissions were sampled at each of 25 traverse points as shown in Figure 2. The stack schematic showing the location of the sampling ports and the upstream and downstream disturbances are presented in Figure 3. During Run 1 each of the traverse points were sampled for 3 minutes. This was increased to 4 minutes per traverse point for Runs 2 and 3. The sampling rate for the three runs averaged 0.43 DSCFM.

SAMPLING MEDIA - The major portion of the particulate was collected on a 4-inch desiccated and pre-weighed glass filter contained in a glass filter holder, with a sintered glass frit, and enclosed in a heated compartment to prevent moisture condensation from plugging the filter during sampling. Some particulate was also be deposited in the probe and on other sample exposed surfaces prior to the filter. These were cleaned after each test by rinsing with acetone and brushing. The particulate was quantitatively retained for subsequent laboratory analysis.

The impinger train, for concurrent moisture collection, consisted of four impingers connected in series with glass ball joint fittings. The first, third, and fourth were of the straight bubbler type (modified Greenburg-Smith) and the second was of the standard Greenburg-Smith type. For the combined particulate and moisture determinations, the first two impingers contained 100-ml. of

FIGURE 1. SCHEMATIC DIAGRAM OF EPA METHOD 5 ISOKINETIC SAMPLING TRAIN FOR PARTICULATES.

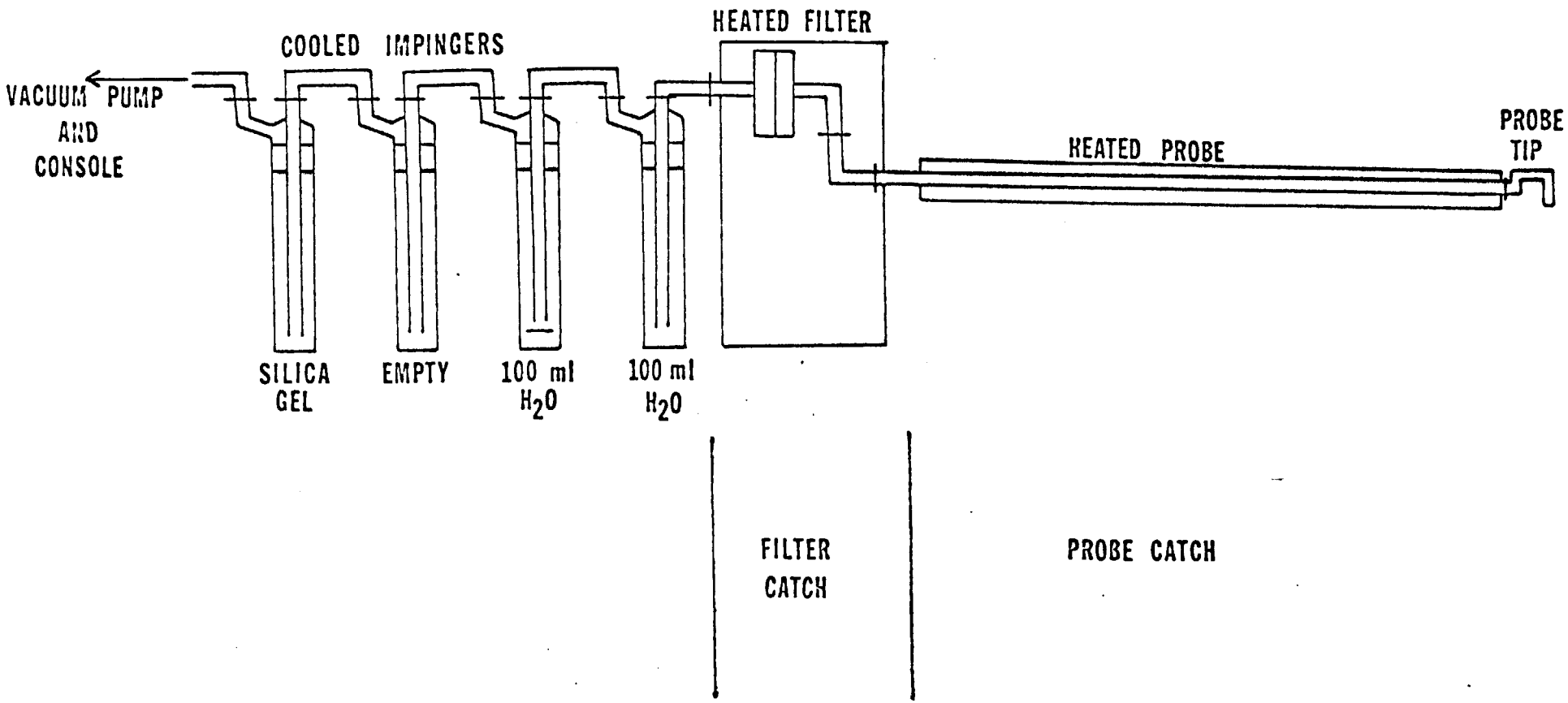
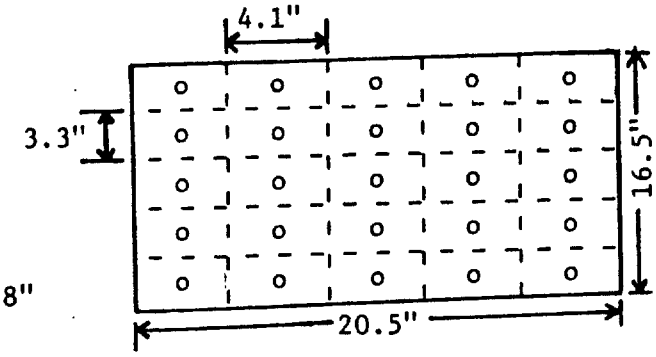


FIGURE 2. TRAVERSE POINT LOCATION FOR RECTANGULAR DUCT

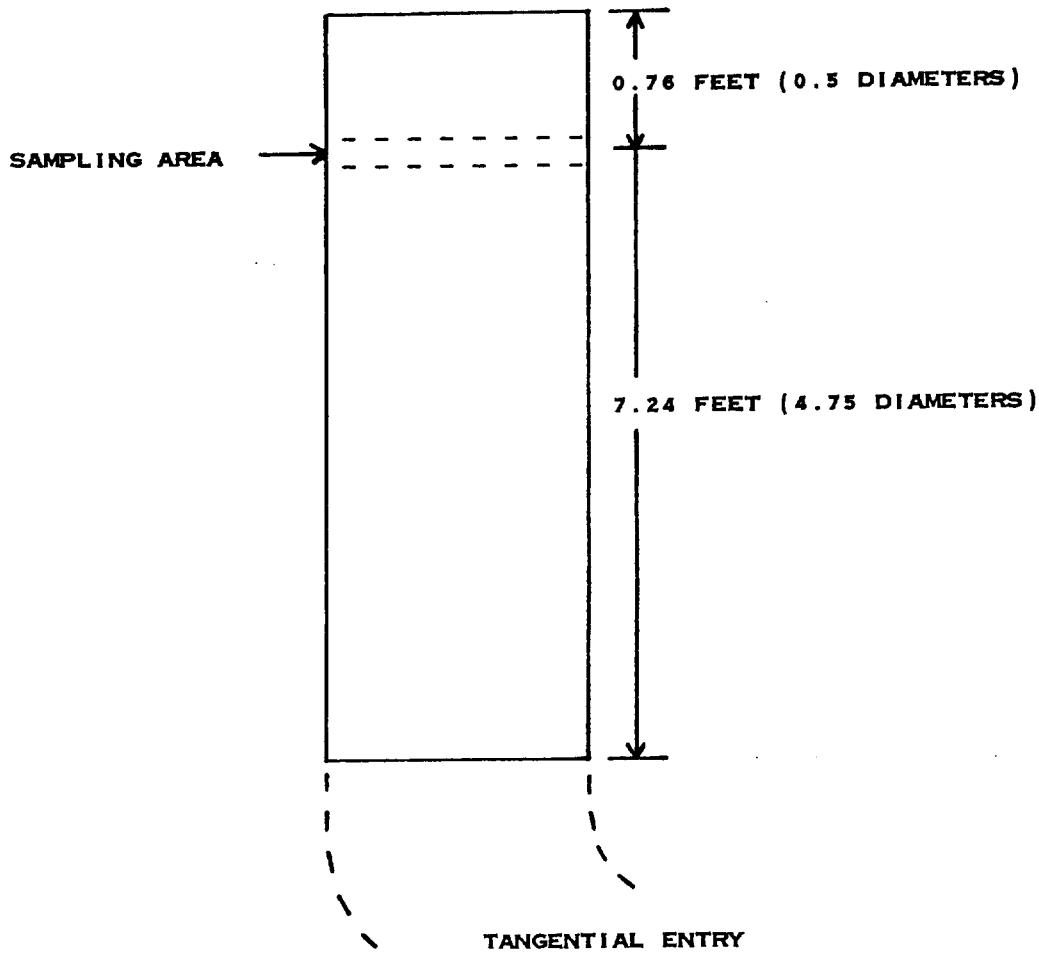
PLANT Wilson Blacktop Company
DATE 6/4/93
SAMPLING LOCATION Asphalt Hot Mix Plant - Stack
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) _____
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) _____
STACK I.D., (DISTANCE A - DISTANCE B) 20.5", Equil. Dia. = 18.28"
NEAREST UPSTREAM DISTURBANCE 9.14", 0.5 Dia.
NEAREST DOWNSTREAM DISTURBANCE 86.86", 4.75 Dia.
CALCULATOR _____



SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF NIPPLE (SUM OF COLUMNS 4 & 5)
1	0.10	20.5"	2"		
2	0.30	20.5"	6.15"		
3	0.50	20.5"	10.25"		
4	0.70	20.5"	14.35"		
5	0.90	20.5"	18.45"		

FIGURE 3. STACK SCHEMATIC, WILSON BLACKTOP COMPANY



RECTANGULAR STACK 16.5 X 20.5 INCHES

deionized water each, the third is empty, and the fourth contained between 200 and 300-grams of pre-weighed silica gel. After the test the volume of the condensate was measured and the percent moisture of the gas stream calculated.

The dry molecular weight of the stack gas was determined by FYRITE analysis for CO_2 and O_2 (CO and N_2 by difference) on a series of grab samples during each run.

SAMPLE ANALYSIS - Each sample filter and any loose particulate matter from the filter container was heated at 103°C for two hours, cooled in a desiccator, and then weighed to the nearest 0.1 mg. on an analytical balance. The filters were then desiccated for another 24-hours and re-weighed. This was repeated until successive weighings agreed within 0.5 mg. or until a weight increase was noted. Control filters (extra pre-weighed filters taken through the same handling, desiccation, and weighing as the sample filters) were used to determine an average net change in their weight, which was then applied as a blank to the sample filter weights.

The acetone washings from the probe and glassware forward of the filter were transferred to a previously desiccated and tared beaker, and evaporated to near dryness in a hood at room temperature and pressure. The nearly dry weighings were then placed in a laboratory drying oven at 103 - 105°C for two hours to drive off residual water, then cooled in a desiccator and weighed. The oven drying, desiccator cooling cycle was repeated until successive weights agreed within 0.5 mg. or until a weight increase was noted. Acetone blanks, from the same lot of acetone used for the probe washings was carried through the above evaporation and drying procedure along with the samples, and the average

net weight change found in the blanks was applied as a correction to the particulate weight obtained form the samples.

RESULTS AND DISCUSSION

The three particulate emission tests were conducted on June 15, 1993. The results of the particulate emission tests are summarized and presented in Table 1. The particulate emission concentration averaged 0.0367 grs./DSCF for the three tests. The isokinetic sampling rate averaged 103.6 percent for the three tests.

Process monitoring conducted during the three emission tests is presented in Appendix V and summarized in Table 2. Dry aggregate feed rate averaged 49.7 TPH for the three tests. AC-20 asphalt bitum feed rate averaged 2.89 TPH while the fuel burner firing rate averaged 40.2 percent. The scrubber pressures are also summarized in Table 2. The circular chart recording the asphalt product temperature and exhaust gas outlet temperature is presented in Appendix V.

TABLE NO. 1

PARTICULATE EMISSION AND SAMPLING SUMMARY

	Run No. 1	Run No. 2	Run No. 3	Units
Emission Concentration	0.0354	0.0390	0.0358	grs./DSCF
Emission Rate	0.68	0.74	0.66	lbs./hr.
Volume Sampled	31.953	43.969	42.216	DSCF
Percent Isokinetic	101.4	105.4	104.0	%
Molecular Wt. of Gas	29.29	29.43	29.86	D/B
Moisture in Gas	39.43	39.22	36.70	%
Average Gas Temperature	179.0	183.0	183.0	°F
Gas Velocity	2484	2478	2319	FPM
Volumetric Flow Rate	4528	4517	4226	ACFM
Volumetric Flow Rate	2240	2224	2163	DSCFM

TABLE NO. 2

PROCESS MONITORING SUMMARY

WILSON BLACKTOP COMPANY

	Dry Aggregate Avg. Feed Rate TPH	AC-20 Avg. Feed Rate TPH	Burner Avg. Firing Rate %	Scrubber Inlet Avg. in. W.C.	Scrubber Outlet Avg. in. W.C.	Scrubber Pressure Drop Avg. in. W.C.
Run 1	49.8	2.72	40.5	-0.92	-7.99	7.07
Run 2	50.3	2.98	40.9	-0.72	-7.89	7.17
Run 3	49.0	2.98	39.3	-0.67	-7.88	7.21
Average	49.7	2.89	40.2	-0.77	-7.92	7.15

APPENDIX I

CALIBRATIONS

S-Type Pitot Tube Calibration Data

Date 10/14/93 Calibrated by MAOCZEK / WHITT

S-Type Pitot Tube Identification 3' S/S w/ 1/4" Nozzle C_p = _____

Calibration Setup: E.T.C.

$$C_p = 0.99\sqrt{\frac{\Delta P_{std}}{\Delta P_{S\text{-}type}}}$$

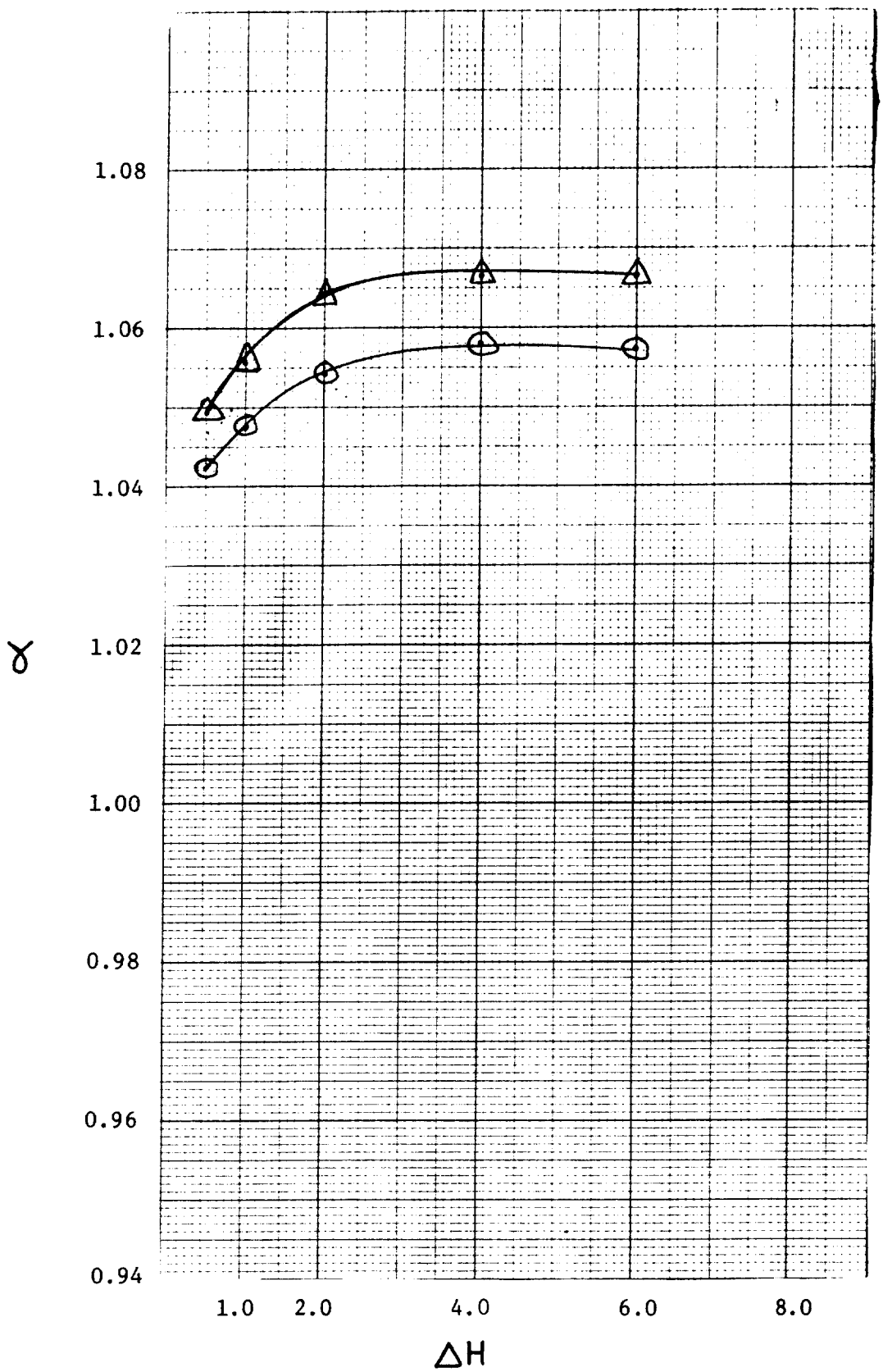
NORMAL: PITOT LEADS DOWN

REVERSE: PITOT LEADS UP

Test No.	Pitot Tube Readings (in. H_2O)				
	Standard	S-Type			
		Normal	C_p	Reversed	C_p
1	0.85	1.15	0.8511	1.25	
2	0.85	1.15	0.8511	1.25	
3	0.85	1.15	0.8511	1.25	
Average			0.8511	Average	

CONSOLE CALIBRATION

Wilson Blacktop
Particulate Emissions



○ Before
△ After

POST SHADE CREEK
Pre Wilson Blacktop

Staksamplr Calibration

Date 02 JUN 93

Barometric Pressure, P_b = 28.84 in. Hg

Operator(s) MOCZEK

Console No. NEW 00039

Dry Gas Meter No. 3017861

Orifice Manometer Setting	Volume						Temperature				Elapsed Time
	Wet Test Meter			Dry Gas Meter			Wet Test	Dry Gas Meter			
	Start	Stop	Volume	Start	Stop	Volume	Meter	Inlet	Outlet	Average	
ΔH			V_w			V_d	T_w			T_d	θ
in. H_2O	ft^3	ft^3	ft^3	ft^3	ft^3	ft^3	°F	°F	°F	°F	min.
0.5	675.696	681.065	5.369	905.125	910.663	5.538	60°F	110 114 117	85 87 89	100	12:38.09 12.6348
1.0	681.457	686.303	4.846	911.066	916.097	5.031		118 124 125	93 92 93	108	8:14.77 8.2462
2.0	686.989	696.609	9.620	916.804	926.806	10.002		127 131 132	95 96 97	113	11:45.07 11.7512
4.0	697.996	707.644	9.648	928.250	938.268	10.018		133 135 136	98 99 101	117	8:20.34 8.3390
6.0	708.855	718.575	9.720	939.509	949.579	10.070		134 136 136	101 101 101	118	6:53.71 6.8952
8.0	719.792	729.513	9.721	950.842	960.893	10.051	—	134 136 137	102 102 103	119	6:00.05 6.0008

Staksamplr Calibration Calculations

ΔH	$P_b + \frac{\Delta H}{13.6}$	$T_w + 460$	$T_d + 460$	Y $\frac{V_w P_b (T_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(T_w + 460)}$	H@ $\frac{0.0317 \Delta H}{P_b (T_d + 460)} \left[\frac{(T_w + 460)\,\theta}{V_w}\right]^2$
0.5	28.88	520	560	1.0426	1.4640
1.0	28.91	520	568	1.0496	1.5094
2.0	28.99	520	573	1.0544	1.5421
4.0	29.13	520	577	1.0580	1.5334
6.0	29.28	520	578	1.0568	1.5453
8.0	29.43	520	579	1.0553	1.5589

POST WILSON
BLACKTOP EMMISIONS

Staksamplr Calibration

Date 22 JUN 93

Console No. ANDERSON 00039

Barometric Pressure, P_b = 28.89 in. Hg

Dry Gas Meter No. 3017861

Operator(s) NIEDZEK

Orfice Manometer Setting	Volume						Temperature				Elapsed Time
	Wet Test Meter			Dry Gas Meter			Wet Test	Dry Gas Meter			
	Start	Stop	Volume	Start	Stop	Volume	Meter	Inlet	Outlet	Average	
ΔH			V_w			V_d	T_w			T_d	θ
in. H_2O	ft^3	ft^3	ft^3	ft^3	ft^3	ft^3	°F	°F	°F	°F	min.
0.5	732.990	737.894	4.904	091.101	096.110	5.009	60°	104 111 117	83 85 87	48°	11:11.49 11.915
1.0	739.483	744.325	4.842	097.737	102.743	5.006	60	123 128 130	90 92 93	109	8.03.51 8.0585
2.0	744.684	754.346	9.662	103.115	113.155	10.040	60	135 139 141	95 98 100	118	11 33.53 11.5588
4.0	754.908	764.537	9.629	113.742	123.760	10.018	60	140 144 145	101 103 104	123	8:15.18 8.2530
6.0	765.410	775.123	9.7130	124.665	134.771	10.106	60	143 146 147	105 106 107	126	6:52.91 6.8818
8.0	777.469	787.124	9.655	137.187 ~~777.469~~	147.214	10.027	60	145 147 148	108 108 109	128	5:56.84 5.9473

Staksamplr Calibration Calculations

ΔH	$P_b + \frac{\Delta H}{13.6}$	$T_w + 460$	$T_d + 460$	γ	$H@$
				$\frac{V_w P_b (T_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(T_w + 460)}$	$\frac{0.0317 \Delta H}{P_b (T_d + 460)} \left[\frac{(T_w + 460)\theta}{V_w}\right]^2$
0.5	28.93	520	558	1.0491	1.3846
1.0	28.96	520	569	1.0558	1.4443
2.0	29.03	520	578	1.0645	1.4693
4.0	29.18	520	583	1.0669	1.4954
6.0	29.33	520	586	1.0669	1.5250
8.0	29.48	520	588	1.0542	1.5317

APPENDIX II

PARTICULATE ANALYTICAL DATA

TRADET LABORATORIES

P. O. BOX 2019
WHEELING, WV 26003
(304) 547-9094

SHIPPING ADDRESS
BATTLE RUN ROAD
RD 2, BOX 227A
TRIADELPHIA, WV 26059

PARTICULATE ANALYTICAL DATA

Plant Wilson Blacktop Run Run 1

Location Asphalt Plant - Stack Emissions Date

MOISTURE:

Impinger	1	2	3	4
Final Volume (ml)	422	207	1	335.6 g
Initial Volume (ml)	100	100	0	326.7 g
Net Volume (ml)	322	107	1	8.9

Total Weight of Water Collected 438.9 grams

PARTICULATES:	Filter	Acetone Probe Wash	Wet Catch
Designation Number	930501	430 ml	—
Final Weight (1)	0.7738	80.2229	
Final Weight (2)	0.7736	80.2229	
Final Weight (3)	0.7732		
Final Weight (4)	0.7732		
Initial Weight (1)	0.7255	80.1969	
Initial Weight (2)	0.7253	80.1968	
Net Weight	0.0491	0.0261	
Blank Correction	+0.0012	−0.0030	
Corrected Net Weight	0.0503	0.0231	

Total Weight Without Wet Catch 0.0734 grams

Total Weight With Wet Catch grams

TRADET LABORATORIES

P. O. BOX 2019
WHEELING, WV 26003
(304) 547-9094

SHIPPING ADDRESS
BATTLE RUN ROAD
RD 2, BOX 227A
TRIADELPHIA, WV 26059

PARTICULATE ANALYTICAL DATA

Plant Wilson Blacktop Run Run 2

Location Asphalt Plant - Stack Emissions Date

MOISTURE:

Impinger	1	2	3	4
Final Volume (ml)	400	374	11	347.1 g
Initial Volume (ml)	100	100	0	333.5 g
Net Volume (ml)	300	274	11	13.6 g

Total Weight of Water Collected 598.6 grams

PARTICULATES:

	Filter	Acetone Probe Wash	Wet Catch
Designation Number	930505	530 ml	—
Final Weight (1)	0.7245	80.0042	
Final Weight (2)	0.7247	80.0041	
Final Weight (3)	0.7241		
Final Weight (4)	0.7240		
Initial Weight (1)	0.6430	79.9709	
Initial Weight (2)	0.6430	79.9710	
Net Weight	0.0810	0.0331	
Blank Correction	+0.0012	-0.0040	
Corrected Net Weight	0.0822	0.0291	

Total Weight Without Wet Catch 0.1113 grams

Total Weight With Wet Catch grams

TRADET LABORATORIES

P. O. BOX 2019
WHEELING, WV 26003
(304) 547-9094

SHIPPING ADDRESS
BATTLE RUN ROAD
RD 2, BOX 227A
TRIADELPHIA, WV 26059

PARTICULATE ANALYTICAL DATA

Plant Wilson Blacktop Run Run 3

Location Asphalt Plant - Stack Emissions Date

MOISTURE:

Impinger	1	2	3	4
Final Volume	396	307	2	346.2
Initial Volume	100	100	0	334.8
Net Volume	296	207	2	11.4

Total Weight of Water Collected 516.4 grams

PARTICULATES:	Filter	Acetone Probe Wash	Wet Catch
Designation Number	930509	550ml	—
Final Weight (1)	0.7078	80.3203	
Final Weight (2)	0.7070	80.3201	
Final Weight (3)	0.70605		
Final Weight (4)	0.7062		
Initial Weight (1)	0.6415	80.2836	
Initial Weight (2)	0.6416	80.2838	
Net Weight	0.0646	0.0363	
Blank Correction	+0.0012	−0.0039	
Corrected Net Weight	0.0658	0.0324	

Total Weight Without Wet Catch 0.0982 grams

Total Weight With Wet Catch grams

TRADET LABORATORIES

P. O. BOX 2019
WHEELING, WV 26003
(304) 547-9094

SHIPPING ADDRESS
BATTLE RUN ROAD
RD 2, BOX 227A
TRIADELPHIA, WV 26059

PARTICULATE ANALYTICAL DATA

Plant Wilson Blacktop Run Blanks

Location Asphalt Plant - Stack Date _____

MOISTURE:

Impinger	1	2	4
Final Volume			
Initial Volume			
Net Volume			

Total Weight of Water Collected _____ grams

PARTICULATES:	Filter	Acetone Probe Wash	Wet Catch
Designation Number	930504	100 ml	—
Final Weight (1)	0.6463	80.6556	
Final Weight (2)	0.6467	80.6558	
Final Weight (3)	0.6451		
Final Weight (4)	0.6451		
Initial Weight (1)	0.6463	80.6550	
Initial Weight (2)	0.6463	80.6549	
Net Weight	−0.0012	+0.0007	
Blank Correction	+0.0012	−0.0007	
Corrected Net Weight			

Total Weight Without Wet Catch _____ grams

Total Weight With Wet Catch _____ grams

Concentration of Particulate Matter in Stack, grs./DSCF

$$C_s' = 0.0154 \frac{M_p}{V_{m,std}}$$

Where M_p = Milligrams of particulate collected

Run 1

$$C'_s = 0.0154 \frac{73.4}{31.953} = 0.0354 \text{ grs/DSCF}$$

Run 2

$$C'_s = 0.0154 \frac{111.3}{43.969} = 0.0390 \text{ grs/DSCF}$$

Run 3

$$C'_s = 0.0154 \frac{98.2}{42.216} = 0.0358 \text{ grs/DSCF}$$

Average = 0.0367 grs/DSCF

Total Particulate Emission Rate, lb./hr:

$$P_{tr} = 0.008571(C_s')(Q_s)$$

RUN 1

$$P_{TR} = 0.008571(0.0354)(2240) = 0.68 \text{ lbs/hr}$$

RUN 2

$$P_{TR} = 0.008571(0.0390)(2224) = 0.74 \text{ lbs/hr}$$

RUN 3

$$P_{TR} = 0.008571(0.0358)(2163) = 0.66 \text{ lbs/hr}$$

Average = 0.69 lbs/hr

APPENDIX III

PARTICULATE SAMPLING - FIELD DATA

FIELD DATA

Pre-Test Leak Check

960.952
960.957
60 sec @ 10" psig

PLANT Wilson Blacktop Co
DATE 10/15/93
SAMPLING LOCATION ~~Asphalt Plant~~ - Stack
SAMPLE TYPE Particulate
RUN NUMBER 1 (one)
OPERATOR Whitt / Nicholson
AMBIENT TEMPERATURE ~~38~~ 67 wet, 70 Dry @ 0800
BAROMETRIC PRESSURE ~~29.34~~ 29.46
STATIC PRESSURE, (P_s)
FILTER NUMBER (s)

PROBE LENGTH AND TYPE 3' S/S
NOZZLE I.D. 0.25 inches
ASSUMED MOISTURE, % ~~34~~ @ 178°
SAMPLE BOX NUMBER
METER BOX NUMBER
METER $\Delta H_@$
C FACTOR
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp Cp = 0.8511, K = 1.48

Post Test Leak Check

995.230
995.232
60 sec @ 10" psig

SCHEMATIC OF TRAVERSE POINT LAYOUT

COPY - ORIGINAL ON FILE

READ AND RECORD ALL DATA EVERY 3 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F 248-25	IMPINGER TEMPERATURE, °F <62
		ST 961.975									
A 1	0 0913	961.975	0.23	0.34	0.34	161	87	82	1	256	44
A 2	3		0.31	0.46	0.46	161	96	82	1	257	42
A 3	6	963.28	0.36	0.54	0.54	165	104	82	1	256	40
A 4	9		0.42	0.61	0.61	176	110	83	1	257	39
A 5	12	966.03	0.47	0.68	0.68	178	116	84	1	257	39
STOP	15	967.546									
B 5	0 0929	967.546	0.49	0.72	0.72	180	114	86	1	257	42
B 4	3	969.12	0.41	0.60	0.60	~~180~~	120	87	1	257	41
B 3	6	970.53	0.36	0.52	0.52	180	121	88	1	255	41
B 2	9	971.99	0.32	0.46	0.46	179	122	89	1	257	42
B 1	12	973.17	0.25	0.36	0.36	180	122	90	1	257	42
STOP	15 0943	974.302									
C 1	0	974.302	0.25	0.36	0.36	180	121	92	1	256	46
C 2	3	—	0.30	0.44	0.44	183	129	92	1	257	44
C 3	6	976.70	0.36	0.52	0.52	181	132	94	1	257	43
C 4	9	978.06	0.40	0.58	0.58	183	134	95	1	255	45
C 5	12	979.59	0.48	0.70	0.70	182	138	96	1	257	45
STOP	15	981.004									

COMMENTS:

CO_2	5.0	5.0	8.0	4.5		Avg	5.6
O_2	11.0	9.5	9.0	9.5			9.8

EPA (Dur) 235
4 72

Run 1 (ONE) - Wilson Blacktop Co

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
D 5	0		981.004	0.51	0.73	0.73	182	136	99	1	256	47
D 4	3		982.55	0.47	0.68	0.68	181	139	100	1	257	46
D 3	6		984.11	0.41	0.60	0.60	182	141	101	1	255	47
D 2	9		985.58	0.34	0.50	0.50	181	141	101	1	258	48
D 1	12		986.90	0.26	0.38	0.38	180	139	102	1	260	49
STOP	15	1016	988.996									
E 1	0	1016	988.996	0.22	0.32	0.37	183	132	105	1	258	~~57~~ 52
E 2	3		989.17	0.30	0.44	0.44	184	129	105	1	252	~~55~~ 50
E 3	6		990.43	0.43	0.63	0.63	183	137	104	1	246	~~52~~ 49
E 4	9		991.92	0.52	0.75	0.75	185	141	105	1	246	47
E 5	12		993.54	0.56	0.81	0.81	185	139	106	1	244	48
STOP	15	1038	995.200									
			ΔVM =	AVG $\sqrt{\Delta P_s}$	Avg ΔH	Avg ΔH	Avg T_s	Avg T_{in}	Avg T_{out}	Avg Vac	Avg Temp	Avg Temp
			33.225	0.6090	0.55	0.55	179	126	94	1	255	45
								Avg T = 110				

EPA (Dun) 236
4 72

Post Test Leak Check
995.287
995.305
60 sec
@ 11 psig

FIELD DATA

PLANT Wilson Blacktop Co
DATE 10/15/93
SAMPLING LOCATION Asphalt Plant - Stack
SAMPLE TYPE Particulate
RUN NUMBER 2 (Two)
OPERATOR VJH.TP / MOSZOK
AMBIENT TEMPERATURE 84 Dry 79 Wet @ 1145
BAROMETRIC PRESSURE 29.40
STATIC PRESSURE, (P_s)
FILTER NUMBER (s)

PROBE LENGTH AND TYPE 3' S/S
NOZZLE I.D. 0.25 inch
ASSUMED MOISTURE, % 35% @ 180°
SAMPLE BOX NUMBER
METER BOX NUMBER
METER $\Delta H_@$
C FACTOR
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp Cp = 8511, K = ~~1.48~~ 1.51

Post Test Leak Check
042.100
042.110
60 sec @ 11 psig

SCHEMATIC OF TRAVERSE POINT LAYOUT

COPY - ORIGINAL ON FILE

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
		ST. 995.324									
A 1	0 1153	995.324	0.18	0.27	0.27	165	110	105	1	248	57
A 2	4	996.73	0.29	0.44	0.44	165	120	103	1	242	52
A 3	8	998.36	0.36	0.54	0.54	180	126	103	1	256	52
A 4	12	000.20	0.41	0.62	0.62	181	130	103	1	265	49
A 5	16	002.14	0.48	0.73	0.73	181	132	102	1	248	48
STOP	20 1213	004.230									
B 5	0	004.230	0.50	0.75	0.75	183	132	102	1	230	49
B 4	4	006.35	0.43	0.65	0.65	181	132	103	1	246	49
B 3	8	008.39	0.34	0.52	0.52	183	134	104	1	260	49
B 2	12	010.26	0.29	0.44	0.44	184	135	105	1	253	50
B 1	16	011.97	0.22	0.34	0.34	186	135	105	1	254	51
STOP	20 1233	013.528									
C 1	0 1233	013.528	0.23	0.35	0.35	188	131	106	1	246	53
C 2	4	015.97	0.28	0.43	0.43	181	133	107	1	248	50
C 3	8	016.76	0.34	0.52	0.52	183	136	108	1	234	49
C 4	12	018.67	0.41	0.62	0.62	186	138	107	1	244	49
C 5	16	020.64	0.50	0.75	0.75	184	140	109	1	246	48
STOP	20	022.809									

COMMENTS:

CO_2	6.0	6.0	~~6.0~~ 7.0	6.0		Avg	6.2
O_2	9.0	9.0	8.5	8.0			8.6

EPA (Dur) 235
4 72

Run 2 (Tino) Wilson Blacktop Co.

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
D5X	0	1255	022.809	0.53	0.78	0.78	188	140	108	1	256	51
D4Z	4		025.02	0.49	0.75	0.75	189	143	109	1	252	56
D3X	8		027.23	0.39	0.59	0.59	189	143	109	1	249	51
D2X	12		029.91	0.32	0.48	0.48	186	143	110	1	246	53
D1X	16		030.98	0.25	0.38	0.38	187	142	110	1	257	54
STOP	20		032.600									
E 1	0	1316	032.600	0.23	0.35	0.35	186	136	108	1	249	57
E 2	4		034.14	0.31	0.47	0.47	184	137	108	1	247	55
E 3	8		035.30	0.44	0.65	0.65	180	138	109	1	248	52
E 4	12		037.36	0.55	0.83	0.83	182	139	110	1	246	57
E 5	16		039.64	0.63	0.95	0.95	183	142	111	1	247	54
STOP	20	1336	042.063									
			ΔV_m = 46.739	Avg $\sqrt{\Delta p_s}$ 0.6057	Avg ΔH 0.57	Avg ΔH 0.57	Avg T_s 183	Avg T_{in} 135	Avg T_{out} 107	Avg Vac 1	Avg Temp 249	Avg Temp 51
								Avg T =	121			

EPA (Dun 236
4 72

Pre Test Leak Check
042.360
042.365

FIELD DATA

PLANT Williams Blacktop Co.
DATE 10/15/93
SAMPLING LOCATION Asphalt Plant-Stack
SAMPLE TYPE Particulate
RUN NUMBER 3 (Three)
OPERATOR Whipp/Moczek
AMBIENT TEMPERATURE 85° Deg 64 wet
BAROMETRIC PRESSURE 29.35
STATIC PRESSURE, (P_s)
FILTER NUMBER (s)

PROBE LENGTH AND TYPE 3' S/D
NOZZLE I.D. 0.25 inches
ASSUMED MOISTURE, % 35%
SAMPLE BOX NUMBER
METER BOX NUMBER
METER $\Delta H_@$
C FACTOR
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp Cp=0.8511, K=1.51

Post Test Leak Check
~~89~~
087.562
087.563

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY ~~3~~ 4 MINUTES

COPY - ORIGINAL ON FILE

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\ in}$), °F	OUTLET ($T_{m\ out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
		ST 042.378									
A 1	0 1445	042.378	0.19	0.28	0.28	163	104	100	1	245	59
A 2	~~3~~ 4	043.87	0.21	0.32	0.32	167	114	99	1	244	55
A 3	~~6~~ 8	045.25	0.24	0.37	0.37	169	111	101	1	248	49
A 4	~~9~~ 12	046.80	0.30	0.46	0.46	181	121	101	1	248	46
A 5	~~12~~ 16	—	0.37	0.55	0.55	182	126	101	1	248	45
STOP	~~15~~ 20 1526	050.371									
B 5	0 1526	050.371	0.54	0.82	0.82	184	129	102	1	247	46
B 4	~~3~~ 4	052.61	0.44	0.66	0.66	185	134	104	1	251	42
B 3	~~6~~ 8	054.67	0.47	0.72	0.72	185	135	106	1	250	42
B 2	~~9~~ 12	056.75	0.10	0.15	0.15	184	135	107	1	247	46
B 1	~~12~~ 16	058.29	0.22	0.34	0.34	183	135	108	1	248	48
STOP	~~15~~ 20 1547	059.702									
C 1	0 1547	059.702	0.23	0.35	0.35	183	133	110	1	248	49
C 2	~~3~~ 4	061.28	0.19	0.29	0.29	183	136	111	1	248	50
C 3	~~6~~ 8	—	0.37	0.55	0.55	188	142	111	1	246	51
C 4	~~9~~ 12	—	0.38	0.58	0.58	189	142	112	1	244	46
C 5	~~12~~ 16	066.44	0.55	0.84	0.84	189	147	113	1	244	44
STOP	~~15~~ 20 1608	068.711									

Down Restart ST 1513

COMMENTS:

CO_2	7.5	11.5	10.5	9.5		Avg	9.8
O_2	11.0	6.5	6.0	5.5			7.2

EPA (Dur) 235
4 72

Run 3 (Three) Wilson Blacktop Co.

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
D 5	0 1609	068.717	0.52	0.79	0.79	187	144	116	246	1	44
D 4	3/4	071.00	0.50	0.75	0.75	189	150	116	247	1	45
D 3	6/8	—	0.42	0.65	0.65	187	151	118	249	1	47
D 2	9/12	075.28	0.37	0.55	0.55	186	149	118	246	1	49
D 1	12/16	077.15	0.21	0.32	0.32	185	144	119	246	1	50
STOP	15 20 1630	078.700									
E 1	0 1630	078.700	0.18	0.27	0.27	187	138	119	245	1	52
E 2	3/4	080.10	0.27	0.41	0.41	187	141	118	242	1	50
E 3	6/8	081.65	0.28	0.43	0.43	187	149	117	241	1	49
E 4	9/12	—	0.40	0.61	0.61	189	150	118	242	1	50
E 5	12/16	085.35	0.53	0.83	0.83	188	149	119	241	1	51
STOP	15 20	087.534									
		ΔV_m = 45.156	Avg $\sqrt{\Delta P_s}$ 0.5732	Avg ΔH 0.52	Avg ΔH 0.52	Avg T_s 183	Avg T_{in} 136	Avg T_{out} 110	Avg T 246	Avg V_m 1	Avg T 48
							Avg T = 123				

EPA (Dur) 236
4 72

APPENDIX IV

PARTICULATE SAMPLING CALCULATIONS

ISOKINETIC SAMPLING CALCULATIONS

RUN DATE 09-Sep-93
20:11:10

Data Input Section

Plant: WILSON BLACKTOP COMPANY

Run: 1 Date: 06/15/93

Barometric Pressure:	29.46	inches Hg		
Stack Static Pressure:	0.00	inches W.C. =	29.46	inches Hg
Stack Diameter:	18.280	inches =	1.823	feet²
Nozzel Diameter:	0.250	inches		
Run Time:	75.0000	minutes		
Meter Volume:	33.225	dry ACF	Corrected Meter Volume	
Meter Correction:	1.049		34.853	dry ACF
Stack Temperature:	179.00	°F		
Meter Inlet Temperature:	126.00	°F	Average Meter Temp.	
Meter Outlet Temperature:	94.00	°F	110.00	°F
Orifice Pressure Drop:	0.5500	inches W.C.		
Average SQRT delta P:	0.6090	inches W.C.		
Pitot Coeffecient – Cp:	0.8511	before test	Average Cp	
	0.8511	after test	0.8511	
Impinger Water:	438.9	grams		
Gas Composition:	5.600	% CO2 D/B	9.800	% O2 D/B

Calculated Data For Run 1

Meter Volume:	31.953	DSCF	Water Volume:	20.804	SCF
Molecular Weight:	29.29	dry		24.84	actual
Sample Rate:	0.8613	ACFM		0.4260	DSCFM
Moisture Content of Stack Gases:			39.43	%	
Stack Flow:		4,528	ACFM	3,698	SCFM
		2,240	DSCFM	2,484.3	ft/min
Gas Density:	0.0521	lbs/ft^3	% Isokinetic:	101.411	%

ISOKINETIC SAMPLING CALCULATIONS

RUN DATE 09-Sep-93
20:21:48

Data Input Section

Plant: WILSON BLACKTOP COMPANY

Run: 2 Date: 06/15/93

Barometric Pressure:	29.40	inches Hg		
Stack Static Pressure:	0.00	inches W.C. =	29.40	inches Hg
Stack Diameter:	18.280	inches =	1.823	feet^2
Nozzel Diameter:	0.250	inches		
Run Time:	100.0000	minutes		
Meter Volume:	46.739	dry ACF	Corrected Meter Volume	
Meter Correction:	1.048		48.982	dry ACF
Stack Temperature:	183.00	°F		
Meter Inlet Temperature:	135.00	°F	Average Meter Temp.	
Meter Outlet Temperature:	107.00	°F	121.00	°F
Orifice Pressure Drop:	0.5700	inches W.C.		
Average SQRT delta P:	0.6057	inches W.C.		
Pitot Coeffecient – Cp:	0.8511	before test	Average Cp	
	0.8511	after test	0.8511	
Impinger Water:	598.6	grams		
Gas Composition:	6.200	% CO2 D/B	8.600	% O2 D/B

Calculated Data For Run 2

Meter Volume:	43.969	DSCF	Water Volume:	28.374	SCF
Molecular Weight:	29.34	dry		24.89	actual
Sample Rate:	0.8932	ACFM		0.4397	DSCFM
Moisture Content of Stack Gases:			39.22	%	
Stack Flow:		4,517	ACFM	3,659	SCFM
		2,224	DSCFM	2,478.4	ft/min
Gas Density:	0.0517	lbs/ft^3	% Isokinetic:	105.410	%

ISOKINETIC SAMPLING CALCULATIONS

RUN DATE 09-Sep-93
20:36:38

Data Input Section

Plant: WILSON BLACKTOP COMPANY

Run: 3 Date: 06/15/93

Barometric Pressure:	29.35	inches Hg		
Stack Static Pressure:	0.00	inches W.C. =	29.35	inches Hg
Stack Diameter:	18.280	inches =	1.823	feet²
Nozzel Diameter:	0.250	inches		
Run Time:	100.0000	minutes		
Meter Volume:	45.156	dry ACF	Corrected Meter Volume	
Meter Correction:	1.047		47.278	dry ACF
Stack Temperature:	183.00	°F		
Meter Inlet Temperature:	136.00	°F	Average Meter Temp.	
Meter Outlet Temperature:	110.00	°F	123.00	°F
Orifice Pressure Drop:	0.5200	inches W.C.		
Average SQRT delta P:	0.5732	inches W.C.		
Pitot Coeffecient – Cp:	0.8511	before test	Average Cp	
	0.8511	after test	0.8511	
Impinger Water:	516.4	grams		
Gas Composition:	9.800	% CO2 D/B	7.200	% O2 D/B

Calculated Data For Run 3

Meter Volume:	42.216	DSCF	Water Volume:	24.477	SCF
Molecular Weight:	29.86	dry		25.50	actual
Sample Rate:	0.8248	ACFM		0.4222	DSCFM
Moisture Content of Stack Gases:			36.70	%	
Stack Flow:		4,226	ACFM	3,417	SCFM
		2,163	DSCFM	2,319.0	ft/min
Gas Density:	0.0522	lbs/ft^3	% Isokinetic:	104.039	%

APPENDIX V

PROCESS MONITORING DATA

PROCESS MONITORING
PARTICULATE EMISSION TEST
WILSON BLACKTOP COMPANY

RUN NO. 1

DATE 6/15/93

* RECORD @ 5 MINUTE INTERVALS * ✓

Time	Dry Aggregate TPH	AC-20 TPH	Burner Firing Rate %
9:07	50.2 6%	3.21	41 %
9:22	49.4 5% BASE LOWER PERCENT	2.62	39%
9:27	50.0	2.68	40%
9:32	50.2	2.69	40%
9:37	49.5	2.67	40%
9:42	50.1	2.68	41%
9:47	50.8	2.62	41%
9:52	48.9	2.63	40%
9:57	50.0	2.64	41%
10:02	50.9	2.63	40%
10:07	51.0 6% TOP RAISE PERCENT	3.25	40%
10:12	50.6	3.22	40%
10:17	49.3 5% BASE LOWER PERCENT	2.60	40%
10:22	48.0	2.50	41%
10:27	49.0	2.59	42%
10:32	49.8	2.64	42%
10:37	49.2	2.59	41%
10:42	49.0	2.53	40%
Average	49.8	2.72	40.5

PROCESS MONITORING
PARTICULATE EMISSION TEST
WILSON BLACKTOP COMPANY

RUN NO. 2

DATE 6/15/93

* RECORD @ 5 MINUTE INTERVALS *

Time	Dry Aggregate TPH	AC-20 TPH	Burner Firing Rate %
11:48	49.0 6% TOP	3.22	38%
11:53	50.8	3.21	38%
11:58	50.2	3.15	41%
12:03	50.4	3:19	41%
12:08	50.0	3:19	41%
12:13	50.1	3.17	41%
12:18	49.8	3:13	41%
12:23	50.8 5% LOWER	2.70	40%
12:28	51.2	2.74	41%
12:33	50.6	2.66	44%
12:38	50.6	2.69	42%
12:43	50.8	2.72	44%
12:48	49.5	2.56	44%
12:53	49.9	2.62	43%
12:58	49.0	2.60	43%
1:03	50.6	2.64	42%
1:08	50.6 6% RAISE	3.21	40%
1:13	51.1	3:18	42%
1:18	49.0	3:10	41%
1:23	49.9	3:18	40%
1:28	49.6	3:18	38%
1:33	50.1	3:20	38%
1:38	52.8	3:38	38%
Average	50.3	2.98	40.9

PROCESS MONITORING
PARTICULATE EMISSION TEST
WILSON BLACKTOP COMPANY

RUN NO. 3

DATE 6/15/93

* RECORD @ 5 MINUTE INTERVALS *

Time	Dry Aggregate TPH	AC-20 TPH	Burner Firing Rate %
2:45	40.9	2.64	32%
2:50	39.9	2.58	28%
2:55	FLAME OUT		
3:15	51	3.13	42%
3:20	51.6	3.12	42%
3:25	50.1	3.10	42%
3:30	49.5	2.98	42%
3:35	48.9	2.96	42%
3:40	49.3	2.95	42%
3:45	50.6	3.03	40%
3:50	50.9	3.12	40%
3:55	49.4	2.93	40%
4:00	48.2	2.93	40%
4:05	49.5	3.03	40%
4:10	48.6	2.96	40%
4:15	4.99	2.95	40%
4:20	4.85	2.90	39%
4:25	49.2	3.03	39%
4:30	49.9	3.03	39%
4:35	50.1	3.02	39%
4:40	49.8	3.02	39%
4:45	49.3	2.98	39%
4:50	51.8	3.16	39%
Average	49.0	2.98	39.3

21.9
3.3

SCRUBBER PRESSURE
PARTICULATE EMISSION TEST
WILSON BLACKTOP COMPANY

RUN NO. 1

DATE 6/15/93 RPW

Time	Scrubber Inlet in. W.C.	Scrubber Outlet in. W.C.
0910	-1.2	-7.8
0921	-1.2	-8.2
0926	-1.1	-8.1
0929	-1.1	-8.1
0939	-1.1	-8.0
0948	-1.2	-8.0
0955	-1.0	-7.9
0958	-1.1	-7.8
1005	-0.5	-8.3
1012	-0.6	-7.8
1018	-0.5	-7.5
1028	-0.8	-8.1
1031	-0.6	-8.3
Average	-0.92	-7.99

1.7
3.1

2.6
19
7.5

4

SCRUBBER PRESSURE
PARTICULATE EMISSION TEST
WILSON BLACKTOP COMPANY

RUN NO. Run 2

DATE 6/15/93

Time	Scrubber Inlet in. W.C.	Scrubber Outlet in. W.C.
1202	-0.5	-8.0
1206	-0.9	-8.2
1210	-0.7	-8.3
1215	-0.8	-8.2
1224	-0.8	-8.0
1224	-0.7	-7.8
1235	-0.7	-7.6
1245	-0.7	-7.6
1252	-0.6	-7.6
1257	-0.7	-7.6
1305	-0.7	-7.6
1309	-1.1	-8.4
1319	-0.7	-7.8
1331	-0.5	-7.8
Average	-0.72	-7.89

SCRUBBER PRESSURE
PARTICULATE EMISSION TEST
WILSON BLACKTOP COMPANY

RUN NO. 3

DATE 6/15/93

Time	Scrubber Inlet in. W.C.	Scrubber Outlet in. W.C.
1447	-0.7	-8.0
1517	-0.6	-7.7
1521	-0.6	-7.7
1529	-0.6	-7.8
1537	-0.7	-8.3
1545	-0.7	-7.8
1550	-0.6	-7.9
1559	-0.7	-7.8
1612	-0.7	-7.9
1633	-0.7	-7.8
1645	-0.7	-8.0
1650	-0.7	-7.9
Average	-0.67	-7.88

6/15/93
Wilson Blacktop
Particulate Emissions Test
Exhaust & Product
Temperatures
HONEYWELL
MINNEAPOLIS, MN.
24001660-013
7PM
6PM
5PM
4PM
3PM
2PM
1PM
NOON
11AM
10AM
9AM
8AM
7AM
6AM
5AM
4AM
0 TO 300 °F J T/C
0 TO 500 °F J T/C