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: 277

Title: Source Sampling For Particulate Emissions, R. E. Hazard Contracting Co., San Diego, CA,

San Diego County Air Pollution Control District, San Diego, CA,

February, 13, 1978.

FILE

AP-42 Section 11.1
Reference
Report Sect. 4
Reference ~~276~~ 277

SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT

TEST DATE: MARCH 17, 1988

TEST NO. : 88077

P.O. NO..: 0442

SUMMARY: EMISSIONS TO ATMOSPHERE

NAME OF FIRM: R. E. HAZARD

LOCATION OF PLANT: 10050 BLACK MOUNTAIN RD,

TYPE OF OPERATION: ASPHALT BATCH PLANT

UNIT TESTED: BAGHOUSE EXHAUST

	MEASURED EMISSIONS	ALLOWABLE EMISSIONS
RULE 20.2 PARTICULATE MATTER, DRY	_____ Grains per SCF	_____ Grains per SCF
RULE 53A SULFUR COMPDS AS SO-2, DRY	_____ % by VOL.	_____ % by VOL.
RULE 53B COMBUSTION CONTAMINANTS	_____ Grains per SCF @12% CO2	_____ Grains per SCF @12% CO2
RULE 53C INCINERATORS	_____ Grains per SCF @12% CO2	_____ Grains per SCF @12% CO2
RULE 54 DUST & FUMES	9.42 Lbs/Hr	40 Lbs/Hr

GAS FLOW RATE, DSCFM 33,762

GAS TEMPERATURE, F 193.0 (AVE)

PRODUCTION RATE 285 tons/hr (AVE)

EMISSION RATES

PARTICULATES: 9.42 Lbs/

OXIDES OF NITROGEN: _____ Lbs/

SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT

TEST DATE: August 19, 1983

TEST NO: 83-231

SUMMARY: EMISSIONS TO ATMOSPHERE

NAME OF FIRM: R. E. Hazard

LOCATION OF PLANT: Carrol Canyon and Black Mountain Road

TYPE OF OPERATION: Hot Mix Asphalt Plant

UNIT TESTED: Baghouse, Output

		MEASURED EMISSIONS		ALLOWABLE EMISSIONS	
Rule 52	Particulate Matter, Dry	0.054	Grains per SCF	N/A	Grains per SCF
Rule 53A	Sulfur Compounds as SO_2, Dry		% by Vol.	0.05	% by Vol.
Rule 53B	Combustion Contaminants		Grains per SCF @12% CO_2		Grains per SCF @12% CO_2
Rule 53C	Incinerators		Grains per SCF @12% CO_2		Grains per SCF @12% CO_2
Rule 54	Dust and Fumes	10.81	Lbs/Hr	40.00	Lbs/Hr
Rule 68	NO_2		ppm by Vol. @ 3% O_2		ppm by Vol. @ 3% O_2
	Other				

Gas Flow Rate, DSCFM 23,000

Gas Temperature, °F (Avg.) 265

Process Weight 290 tons/hr.

EMISSION RATES

Particulates: 10.81 Lbs/Hr

Oxides of Nitrogen: _____ Lbs/Hr

COUNTY OF SAN DIEGO

INTER-DEPARTMENTAL CORRESPONDENCE

DATE March 9, 1979

TO: Ray Skoff

THRU: Dick Baldwin RHB

FROM: Hill Kaplan

SUBJECT: Review of a Source Test Report: Hazard Hot Mix Asphalt Baghouse ST-910 Test Date February 13, 1978.

I have reviewed the above test report submitted by BTC Laboratories and recommend that it be accepted.

Field tests performed on February 13 were observed by Paul Weir. No gross sampling errors were reported.

Data for both runs were recalculated using computer programs. These results were almost identical to those in the test report.

BTC has also reported grain loading based on EPA 5 (Front End only).

RESULTS

		Run 1	Run 2
Total Catch	gr/DSCF	0.0183	0.0122
	#/hr.	5.6	3.9
Front End	gr/DSCF	0.0140	0.0084
	#/hr.	4.3	2.7

The lower emission rate noted for Run 2 may have been caused by a change in the type of asphalt being produced. The product changed to a cold mix after 48 minutes of sampling.

HK:sb

BTC Laboratories
1775 CALLENS ROAD, VENTURA, CA 93003 • 805/644-1095

February 26, 1979

Job Number: C9-2166-C01
Lab Number: 795770

R.E. Hazard Contracting Co.
Post Office Box 3217
San Diego, California 92103

ATTENTION: Mr. Bruce Hazard

REGARDING: Source Emission Testing of an Asphalt Hot Mix Batch Plant Located in San Diego, California

Dear Mr. Hazard:

On February 13, 1979, Mr. Herb DeFriez, Senior Engineer, and Mr. Tom Porter, Senior Chemist with BTC Laboratories, performed two source emission tests for particulate matter on a baghouse connected to a rotary drier of your asphalt hot mix batch plant.

SAMPLING AND ANALYTICAL PROCEDURES

Gas Analysis: Six grab samples of the stack gases were taken from the stack throughout the run. A stainless probe and one-way squeeze bulb were used to transport the gases to a standard Orsat Flue Gas Analyzer. The percent CO_2 and O_2 were determined volumetrically. All readings obtained for one run are averaged together to determine the average stack gas composition.

Stack Gas Velocity: The stack gas velocity was determined using an "S" type pitot tube connected to a manometer. The "S" type pitot was used to determine the stack velocity profile for each run.

The stack temperature was determined using a thermocouple and an indicating pyrometer. The proportion of water was determined volumetrically and the dry molecular weight of the stack gas determined by E.P.A. Method 3, equation 3-2. Stack velocities were calculated using E.P.A. Method 2, equation 2-9; gas volumetric flow rate was determined by equation 2-10.

Particulate Emissions: Particulates were collected using a Lace Model 31 Stack Sampler System that conforms to E.P.A. requirements for particulate sampling. The system consists of a heated probe, filter, and cooled impingers (see E.P.A. Method 5). After the weight of the particulates on the filter and in the probe is determined, the total dissolved solids in the impingers is determined and added to the particulate weight in order to comply with San Diego County regulations. No sampling problems were encountered during the runs.

The sampling was conducted utilizing a total of 36 points. Each traverse had 18 points and two (2) traverses were done at 90° to each other.

Leak Checks: Leak checks were conducted on the pitot tube and sampling train before and after each run. The leak check was done at the end of the pitot tube and at the nozzle of the sampling probe.

Run one was conducted using 36 points at 2½ minutes per point. The run was done isokinetically with an I value of 109.6%.

Run two was done by again using 36 points at 2 minutes per point. The isokinetic value for this run was 105.4%.

All sampling methods and procedures were approved by Mr. Paul Weir, San Diego County APCD representative. All leak tests passed the requirements set forth by the E.P.A. and San Diego APCD.

RESULTS

Run #1	Particulate	0.0183 gr/DSCF 0.0140 gr/DSCF (front catch) 5.6 lbs/hr 4.3 lbs/hr (front catch)
Run #2	Particulate	0.0122 gr/DSCF 0.0084 gr/DSCF (front catch) 3.9 lbs/hr 2.7 lbs/hr (front catch)

COMMENTS

All washings and rinsings of the nozzle, probe and impingers were done using acetone and water.

No sampling or operational problems were encountered during the runs. However the regular hot mix was stopped 48 minutes into run number two. A decision was made to continue the operation and testing utilizing a cold mix. This produced a slightly cooler temperature and lower water content. These were taken into account during the remainder of the test. This change was sanctioned by Mr. Paul Weir.

It appears from the above results that this unit has met San Diego County APCD rules 52 and 54 and E.P.A. limits for new sources.

If you have any questions or need additional information, please contact me at (805) 644-1095.

Respectfully submitted,

Copies: 1 Mr. Larry Woosley
1 File

BTC LABORATORIES

Tom Porter

Tom Porter
Chemical Labortory Supervisor

TP:ts

Test No. 1

Page

Date 2-13-79

SUMMARY: EMISSIONS TO ATMOSPHERE

Name of Firm R.E. Hazard Company

Location of Plant San Diego, California

Type of Operation Asphalt Hot Mix Batch Plant

Unit Tested Baghouse

	MEASURED EMISSIONS		ALLOWABLE EMISSIONS	
Particulate Matter	0.0183	Grains per SCFD	0.1	Grains per SCFD
Sulfur Compounds as SO_2	NA	ppm by Vol.	-	ppm by Vol.
Combustion Contaminants	NA	Grains Per SCF at 12% CO_2	-	Grains per SCF at 12% CO_2
Dust and Fumes	5.6	Lbs. per. hr.	40	Lbs. per. hr.
CO_2	2.6	% by Vol. Dry		
Aldehydes as HCHO	NA	ppm by Vol.		
Hydrocarbons as Hexane	NA	ppm by Vol.		
NO_x as NO_2	NA	ppm by Vol.		
Organic Acids as Acetic Acid	NA	ppm by Vol.		
Other				

Gas Flow Rate, SCFM D 35600

Gas Temperature, °F 224.9

Efficiency of Control Equipment,% Not Determined

* 0.0140 grains/SCFD Front End Catch

* 4.3 lbs/hr Front End Catch

Test No. 2 Page

Date 2-13-79

SUMMARY: EMISSIONS TO ATMOSPHERE

Name of Firm R.E. Hazard Company

Location of Plant San Deigo, California

Type of Operation Asphalt Hot Mix Batch Plant

Unit Tested Baghouse

	MEASURED EMISSIONS		ALLOWABLE EMISSIONS	
*Particulate Matter	0.0122	Grains per SCFD	0.1	Grains per SCFD
Sulfur Compounds as SO_2	NA	ppm by Vol.	-	ppm by Vol.
Combustion Contaminants	NA	Grains Per SCF at 12% CO_2	-	Grains per SCF at 12% CO_2
*Dust and Fumes	3.9	Lbs. per. hr.	40	Lbs. per. hr.
CO_2	2.1	% by Vol. Dry		
Aldehydes as HCHO	NA	ppm by Vol.		
Hydrocarbons as Hexane	NA	ppm by Vol.		
NO_x as NO_2	NA	ppm by Vol.		
Organic Acids as Acetic Acid	NA	ppm by Vol.		
Other				

Gas Flow Rate, SCFM D 37550

Gas Temperature, °F 195.2

Efficiency of Control Equipment,% Not Determined

* 0.0084 grains/SCFD Front End Catch

** 2.7 lbs/hr Front End Catch

Test No. 1

Page

Date 2-13-79

SUMMARY OF RESULTS

1.	Name of Firm	R.E. Hazard Company
2.	Location of Plant	San Diego, California
3.	Basic Equipment	Asphalt Hot Mix Batch Plant
4.	Control Equipment	Baghouse
5.	Equipment Tested	Baghouse
6.	Process Weight Per Hour	280 Tons
7.	Sampling Station	Exhaust Stack After Baghouse
8.	Average Gas. Velocity, FPS	76.1
9.	Gas Temperature, °F	224.9
10.	Gas Flow Rate, SFCM	35,600
11.	Material Sampled	Particulate
12.	Time of Test-Begin	9:42
13.	Time of Test-End	11:12
14.	Net Sampling Time, Min.	90
15.	Conc.,Grains/ SCFD	0.0183 (0.0140 Front End)
16.	Conc.,Gr./SCF at 12% CO_2	-
17.	Conc., Volume PPM	-
18.	Pounds Per Hour	5.6 (4.3 Front End)
19.	Collection Efficiency, %	Not Determined
20.	Water Vapor, Vol. %	19.1
21.	CO_2, Vol. % (Stack Cond.)	2.1
22.	O_2, Vol % (Stack Cond.)	12.7
23.	CO, Vol % (Stack Cond.)	-
24.	N_2, Vol % (Stack Cond.)	66.1

Test No. 2

Page

Date 2-13-79

SUMMARY OF RESULTS

1.	Name of Firm	R.E. Hazard
2.	Location of Plant	San Diego, California
3.	Basic Equipment	Asphalt Hot Mix Batch Plant
4.	Control Equipment	Baghouse
5.	Equipment Tested	Baghouse
6.	Process Weight Per Hour	280 Tons
7.	Sampling Station	Exhaust Stack After Baghouse
8.	Average Gas. Velocity, FPS	73.8
9.	Gas Temperature, °F	195.2
10.	Gas Flow Rate, SFCMD	37550
11.	Material Sampled	Particulate
12.	Time of Test-Begin	12:30
13.	Time of Test-End	1:42
14.	Net Sampling Time, Min.	72
15.	Conc.,Grains/ SCF	0.0122 (0.0084 Front End)
16.	Conc.,Gr./SCF at 12% CO_2	-
17.	Conc., Volume PPM	-
18.	Pounds Per Hour	3.8 (2.7 Front End)
19.	Collection Efficiency, %	Not Determined
20.	Water Vapor, Vol. %	15.4
21.	CO_2, Vol. % (Stack Cond.)	1.8
22.	O_2, Vol % (Stack Cond.)	14.3
23.	CO, Vol % (Stack Cond.)	-
24.	N_2, Vol % (Stack Cond.)	68.5

TEST NO. 1

PAGE

DATE 2-13-79

SUMMARY OF TEST DATA

1.	SAMPLING STATION	Exhaust Stack After Baghouse
2.	MATERIAL COLLECTED	Particulate
3.	OPERATING CONDITION	Normal
4.	AV. FLUE GAS VELOCITY, FT./SEC.	76.1
5.	AV. FLUE GAS TEMP., °F	224.9
6.	AREA OF FLUE, SQ. FT.	12.57
7.	FLUE GAS FLOW RATE, SCFMD	35600
8.	SAMPLING NOZZLE DIAM., MM	5.10
9.	METER SAMPLING RATE, CFM	Variable
10.	TESTING TIME, MIN.	90
11.	AV. METER VACUUM, IN. HG	Variable
12.	AV. METER TEMP., °F	96.2
13.	SAMPLE GAS VOL. - METER COND., CF	62.054 (66.3977 Corrected)
14.	WATER VAPOR: CONDENSATE, ML	313.6
15.	TOTAL SAMPLE GAS VOLUME, CF	-
16.	TOTAL SAMPLE GAS VOLUME, SCFD	62.832
17.	WEIGHT COLLECTED, GRAMS A. Probe	0.0537
	B. Filter	0.0035
	C. Impingers	0.0175
	D.	
	TOTAL WEIGHT GRAMS	0.0747
18.	CONCENTRATION, GRAINS/SCFD	0.0183 (0.0140 Front End)
19.	CONCENTRATION, GRAINS/SCF @ 12% CO_2	-
20.	CONCENTRATION, PERCENT BY VOLUME	-
21.	CONCENTRATION, PPM BY VOLUME	-
22.	MATERIAL FLOW RATE, LBS/HR	5.6 (4.3 Front End)

COLLECTION EFFICIENCY

23.	MATERIAL TO COLLECTOR, LBS/HR	Not Determined
24.	LOSS TO ATMOSPHERE, LBS/HR	
25.	MATERIAL COLLECTED, LBS/HR	
26.	EFFICIENCY, %	

ORSAT ANALYSIS

DRY BASIS:

CO_2, %	2.6
O_2, %	15.7
CO, %	-
N_2, %	81.7

WET BASIS:

CO_2, %	2.1
O_2, %	12.7
CO, %	-
N_2, %	66.1
H_2O, %	19.1

TEST NO. 2

PAGE

DATE 2-13-79

SUMMARY OF TEST DATA

1.	SAMPLING STATION	Exhaust Stack After Baghouse
2.	MATERIAL COLLECTED	Particulate
3.	OPERATING CONDITION	Normal *
4.	AV. FLUE GAS VELOCITY, FT./SEC.	73.8
5.	AV. FLUE GAS TEMP., °F	195.2
6.	AREA OF FLUE, SQ. FT.	12.57
7.	FLUE GAS FLOW RATE, SCFMD	37550
8.	SAMPLING NOZZLE DIAM., MM	5.10
9.	METER SAMPLING RATE, CFM	Variable
10.	TESTING TIME, MIN.	72
11.	AV. METER VACUUM, IN. HG	Variable
12.	AV. METER TEMP., °F	95.6
13.	SAMPLE GAS VOL. - METER COND., CF	50.489 (54.0232 Corrected)
14.	WATER VAPOR: CONDENSATE, ML	197.7
15.	TOTAL SAMPLE GAS VOLUME, CF	-
16.	TOTAL SAMPLE GAS VOLUME, SCFD	51.0312
17.	WEIGHT COLLECTED, GRAMS A. Probe	0.0196
	B. Filter	0.0083
	C. Impingers	0.0126
	D.	
	TOTAL WEIGHT GRAMS	0.0405
18.	CONCENTRATION, GRAINS/SCFD	0.0122 (0.0084 Front End)
19.	CONCENTRATION, GRAINS/SCF @ 12% CO_2	-
20.	CONCENTRATION, PERCENT BY VOLUME	-
21.	CONCENTRATION, PPM BY VOLUME	-
22.	MATERIAL FLOW RATE, LBS/HR	3.9 (2.7 Front End)

COLLECTION EFFICIENCY

23.	MATERIAL TO COLLECTOR, LBS/HR	Not Determined
24.	LOSS TO ATMOSPHERE, LBS/HR	
25.	MATERIAL COLLECTED, LBS/HR	
26.	EFFICIENCY, %	

ORSAT ANALYSIS

DRY BASIS:

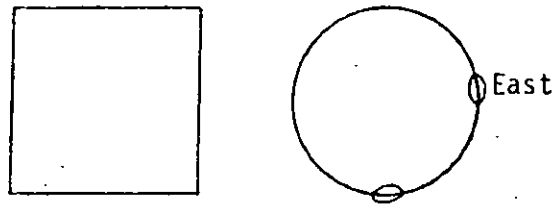
CO_2, %	2.1
O_2, %	16.9
CO, %	-
N_2, %	81.0

WET BASIS:

CO_2, %	1.8
O_2, %	14.3
CO, %	-
N_2, %	68.5
H_2O, %	15.4

* Change over to cold mix @ point 7 - 48 minutes into the run.

Plant: R.E. Hazard
Location: San Diego, CA
Operator: H.DeF. & T.P.
Date: 2/13/79
Run No.: 1 Particulate
Sample Box No.: 11
Meter Box No.: 10
Pitot Factor: 0.84
Meter Factor: 1.07



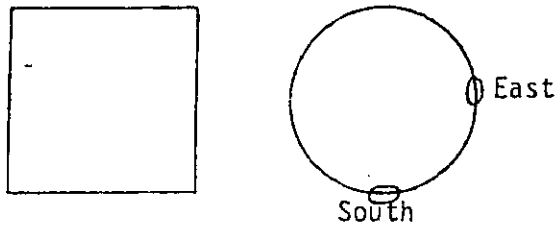
Schematic of Stack Cross Section

Ambient Temp, °F: 68
Barametric Press, in Hg: 29.71
Assumed Moisture, % : 18
Heater Box Setting : ON
Probe Length, ft: 5
Nozzle Diameter, in: 0.203
Probe Heater Setting : 5
Approx. Wind Vel., MPH : 2-3

Traverse Point Number		Sample Time (e), min.	Static Pressure (Ps), in Hg	Stack Temp. (Ts), °F	Velocity Head (ΔPs) in. H_2O	Pressure Diff Orifice Meter (ΔH), in H_2O	Gas Sample Volume (Vm) ft.^{3}	Gas Sample Temp. @ Dry Gas Meter Inlet (Tm), °F	Gas Sample Temp. @ Dry Gas Meter Outlet (Tm), °F	Sample Box Temp. °F	Temp Gas Last °F
1.0	E1	9:42 0	+0.04 10"Vac	220	1.40 1.183	1.6	862.442	70	70	+230	
2.11	2	2.5	13"Vac	220	1.65 1.285	1.9	864.4	86	68		46
3.60	3	5	15"Vac	220	1.80 1.342	2.05	866.1	90	68		
5.23	4	7.5	17"Vac	230	1.95 1.396	2.25	868.1	91	70		
7.01	5	10	13"Vac	235	1.60 1.265	1.8	870.1	91	72		
9.02	6	12.5		238	1.50 1.225	1.65	871.0	95	73		
11.33	7	15		240	1.60 1.265	1.8	873.8	100	74		
14.21	8	17.5		230	1.55 1.245	1.8	875.7	102	75		
18.34	9	20		232	1.35 1.162	1.5	877.6	103	76		
29.66	10	22.5		232	1.20 1.095	1.40	879.4	106	78		
33.79	11	25		230	1.15 1.072	1.35	880.9	110	80		
36.67	12	27.5		228	1.0 1.	1.15	882.5	111	81		
					14.535						
Total					ca 1.252			Avg	Avg		
Average					$\sqrt{\Delta P}$ =			Avg			

Before Leak Rate Pitot Top @ -3.85" H_2O = 3.85
Bottom @ +3.53" H_2O = 3.43" H_2O in 1 min

Plant: _____
Location: _____
Operator: _____
Date: _____
Run No.: 1 Part. _____
Sample Box No.: _____
Meter Box No.: _____
Pitot Factor: _____

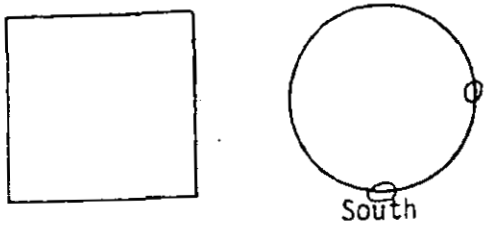


Schematic of Stack Cross Section

Ambient Temp, °F: _____
Barametric Press, in Hg: _____
Assumed Moisture, % : _____
Heater Box Setting : _____
Probe Length, ft: _____
Nozzle Diameter, in: _____
Probe Heater Setting : _____
Approx. Wind Vel., MPH : _____

Traverse Point Number		Sample Time (θ), min.	Static Pressure (Ps), in Hg	Stack Temp. (Ts), °F	Velocity Head (ΔPs) in. H_2O	Pressure Diff Orifice Meter (ΔH), in H_2O	Gas Sample Volume (Vm) ft.^{3}	Gas Sample Temp. @ Dry Gas Meter Inlet (Tm), °F	Gas Sample Temp. @ Dry Gas Meter Outlet (Tm), °F	Sample Box Temp. °F	Temp. of Gas from Last Imp °F
38.98	13	30		228	1.0 1	1.15	884.1	112	82	+230	
40.99	14	32.5		225	1.05 1.024	1.2	885.6	113	83		
42.77	15	35		222	1.15 1.072	1.3	887.1	114	83		
44.40	16	37.5	8" Vac	220	1.20 1.095	1.35	888.7	114	84		
45.89	17	40		222	1.20 1.095	1.35	890.3	114	85		
47.33	18	42.5		223	1.15 1.072	1.3	891.9	115	86		50
Stop	S 1	10:35 0 45		222	1.25 1.118	1.40	893.553	110	86		
	2	2.5		222	1.30 1.140	1.5	895.3	115	87		
	3	5		225	1.45 1.204	1.65	896.8	116	88		
	4	7.5		225	1.6 1.265	1.8	898.7	116	88		
	5	10		222	1.45 1.204	1.65	901.0	115	88		
	6	12.5		225	1.40 1.183	1.60	902.5	115	89		
	7	15		222	1.30 1.140	1.50	904.2	116	89		
Total					14.612			Avg	Avg		
Average					$\sqrt{\Delta P}$ =			Avg			

Plant: _____
Location: _____
Operator: _____
Date: _____
Run No.: 1 Part. _____
Sample Box No.: _____
Meter Box No.: _____
Pitot Factor: _____



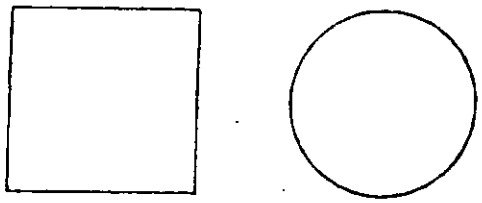
Schematic of Stack Cross Section

Ambient Temp, °F: _____
Barametric Press, in Hg: _____
Assumed Moisture, % : _____
Heater Box Setting : _____
Probe Length, ft: _____
Nozzle Diameter, in: _____
Probe Heater Setting : _____
Approx. Wind Vel., MPH : _____

Traverse Point Number	Sample Time (e), min.	Static Pressure (Ps), in Hg	Stack Temp. (Ts), °F	Velocity Head (ΔPs) in. H_2O	Pressure Diff Orifice Meter (ΔH), in H_2O	Gas Sample Volume (Vm) ft.^{3}	Gas Sample Temp. @ Dry Gas Meter Inlet (Tm), °F	Gas Sample Temp. @ Dry Gas Meter Outlet (Tm), °F	Sample Box Temp. °F	Temp. of Gas from Last Imp. °F
8	17.5		220	1.20 1.095	1.35	906.0	116	89	+230	
9	20		222	1.1 1.049	1.25	907.7	117	90		
10	22.5		222	1.25 1.118	1.4	909.3	118	90		
11	25		230	1.30 1.140	1.5	911.0	118	90		
12	27.5		225	1.35 1.162	1.55	912.8	118	90		
13	30		220	1.3 1.140	1.45	915.0	117	90		
14	32.5		220	1.3 1.140	1.45	916.3	117	90		58
15	35		220	1.3 1.140	1.45	917.9	117	90		
16	37.5		220	1.2 1.095	1.35	919.6	117	90		
17	40		220	1.15 1.072	1.3	921.3	118	90		
18	42.5		218	1.0 1.	1.1	923.0	118	90		
STOP	45			12.105		924.496				
Total							Avg 109.2	Avg 83.1		
Average	90	+0.04	224.9	$\sqrt{\Delta P}$ = 1.147	1.50	62.054	Avg 96.2		+230	51.3

After Leak Rate Sample System @ 17.5" Hg = 0.011 cfm .146
Pitot Lower 2.75" H_2O → 2.75" in 1 min

Plant: R.E. Hazard
Location: San Diego, CA
Operator: H.DeF. & T.P.
Date: 2-13-79
Run No.: 2 Particulate
Sample Box No.: 11
Meter Box No.: 10
Pitot Factor: 0.84
Meter Factor: 1.07



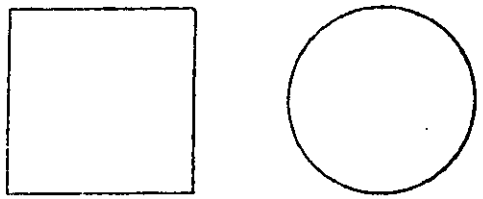
Schematic of Stack Cross Section

Ambient Temp, °F: 75
Barametric Press, in Hg: 29.62
Assumed Moisture, % : 20
Heater Box Setting : ON
Probe Length, ft: 5
Nozzle Diameter, in: 0.203
Probe Heater Setting : 4
Approx. Wind Vel., MPH : 5-7

Traverse Point Number	Sample Time (θ), min.	Static Pressure (Ps), in Hg	Stack Temp. (Ts), °F	Velocity Head (ΔPs) in. H_2O	Pressure Diff Orifice Meter (ΔH), in H_2O	Gas Sample Volume (Vm) ft.3	Gas Sample Temp. @ Dry Gas Meter Inlet (Tm), °F	Gas Sample Temp. @ Dry Gas Meter Outlet (Tm), °F	Sample Box Temp. °F	Temp. Gas fi Last I °F
S 1	12:30 0	+0.04"	205	1.00/.	1.1	925.145	86	86	+230	
2	2	9" Vac	220	1.20/.095	1.3	926.0	105	87		
3	4		220	1.45/.204	1.6	927.3	107	87		
4	6		220	1.50/.225	1.65	928.7	106	87		
5	8	14" Vac	220	1.50/.225	1.65	930.1	105	87		
6	10		220	1.15/.072	1.3	931.5	106	86		48
7	12		220	1.00/.	1.1	932.9	108	86		
8	14		222	1.10/.049	1.2	934.1	111	86		
9	16		225	1.10/.049	1.2	935.4	112	86		
10	18		225	1.25/.118	1.4	936.6	112	87		
11	20		223	1.35/.162	1.5	938.0	111	87		
12	22		222	1.35/.162	1.5	939.3	111	87		
				13.36						
Total							Avg	Avg		
Average				$\sqrt{\Delta P}$=			Avg			

Before Leak Rate Sample System @ 17.5" Hg = 0.022 cfm
Pitot Leak @ 2.35" H_2O = 2.25 in 1 min (upper)

Plant: _____
Location: _____
Operator: _____
Date: _____
Run No.: 2 Part
Sample Box No.: _____
Meter Box No.: _____
Pitot Factor: _____



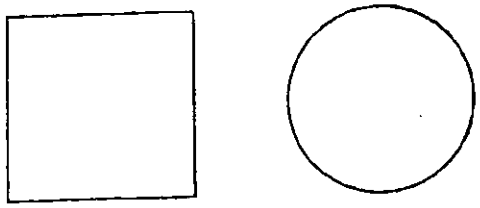
Ambient Temp, °F: _____
Barametric Press, in Hg: _____
Assumed Moisture, % : _____
Heater Box Setting : _____
Probe Length, ft: _____
Nozzle Diameter, in: _____
Probe Heater Setting : _____
Approx. Wind Vel., MPH : _____

Schematic of Stack Cross Section

Traverse Point Number	Sample Time (θ), min.	Static Pressure (Ps), in Hg	Stack Temp. (Ts), °F	Velocity Head (ΔPs) in. H_2O	Pressure Diff Orifice Meter (ΔH), in H_2O	Gas Sample Volume (Vm) ft.^{3}	Gas Sample Temp. @ Dry Gas Meter Inlet (Tm), °F	Gas Sample Temp. @ Dry Gas Meter Outlet (Tm), °F	Sample Box Temp. °F	Temp Gas Last
S 13	24	13" Vac	222	1.30 1.160	1.4	940.7	110	87		
14	26		220	1.30 1.160	1.4	942.1	110	87		
15	28		220	1.25 1.118	1.4	943.4	111	87		
16	30		221	1.20 1.095	1.35	944.8	112	88		
17	32		221	1.1 1.049	1.2	946.1	113	88		54
18	34		220	1.0	1.1	947.4	114	88		
E 1	1:15 0 36		210	1.35 1.162	1.5	948.573	111	88		
2	2	17" Vac	220	1.70 1.304	1.85	950.0	112	88		
3	4		225	1.80 1.342	1.95	951.3	110	89		
4	6	18.5" Vac	225	1.85 1.360	2.0	953.0	106	89		
5	8		225	1.75 1.323	1.90	954.5	104	89		
6	10		225	1.50 1.225	1.65	956.2	104	89		
Stop No Feed				21.010						
Total				21.70			Avg	Avg		
Average				$\sqrt{\Delta P}$ =			Avg			

Stopped at end of point #6 @ 12 min no feed.

Plant: _____
Location: _____
Operator: _____
Date: _____
Run No.: 2 Part
Sample Box No.: _____
Meter Box No.: _____
Pitot Factor: _____



Schematic of Stack Cross Section

Ambient Temp, °F: _____
Barametric Press, in Hg: _____
Assumed Moisture, % : 14
Heater Box Setting : _____
Probe Length, ft: _____
Nozzle Diameter, in: _____
Probe Heater Setting : _____
Approx. Wind Vel., MPH : _____

Traverse Point Number	Sample Time (e), min.	Static Pressure (Ps), in Hg	Stack Temp. (Ts), °F	Velocity Head (ΔPs) in. H_2O	Pressure Diff Orifice Meter (ΔH), in H_2O	Gas Sample Volume (Vm) ft.^{3}	Gas Sample Temp. @ Dry Gas Meter Inlet (Tm), °F	Gas Sample Temp. @ Dry Gas Meter Outlet (Tm), °F	Sample Box Temp. °F	Temp. of Gas from Last Imp °F
7	2:10 0, 12		140	1.5 / 225	2.1	957.902	86	86	+230	
8	2		140	1.55 / 245	2.15	959.2	96	86		
9	4		140	1.55 / 245	2.15	960.7	95	85		
10	6	19" Vac	145	1.45 / 204	2.0	962.4	95	85		
11	8		150	1.30 / 140	1.8	964.0	95	85		
12	10		145	1.30 / 140	1.8	965.5	96	84		
13	12		148	1.20 / 095	1.7	966.9	98	84		
14	14		148	1.20 / 095	1.7	968.5	100	84		60
15	16		145	1.20 / 095	1.7	970.0	100	84		
16	18		145	1.1 / 044	1.55	971.4	102	83		
17	20		143	1.0 / 1.0	1.4	972.9	104	84		
18	22		142	1.0 / 1.0	1.4	974.2	107	83		
	24			.152		975.634				
Total							Avg 104.8	Avg 86.4		
Average	72	+0.04	195.2	$\sqrt{\Delta P}$ = 1.143	1.57	50.489	Avg 95.6		+230	54

Job finished at point 6, start making cold mix at point 7 at 2:05.
After Leak Rate Sample System @ 19" Vac = 0.019 cfm

BTC LABORATORIES

PARTICULATE MATTER LABORATORY DATA

I. PARTICULATES

		RUN # 1		RUN # 2	
A. FRONT FILTER	FINAL	0.6483 G		0.6412 G	
	TARE	0.6448 G	0.0035 G	0.6399 G	0.0013 G
B. PROBE RINSE	FINAL	68.9751 G		69.5962 G	
	TARE	68.9906 G	0.0155 G	69.5758 G	0.0204 G
C. IMPINGER CATCH	FINAL	67.1216 G		66.8060 G	
	TARE	67.1033 G	0.0183 G	66.7926 G	0.0134 G
D. SOLVENT EXTRACTION	FINAL	_____ G		_____ G	
	TARE	_____ G	_____ G	_____ G	_____ G

F. BLANKS

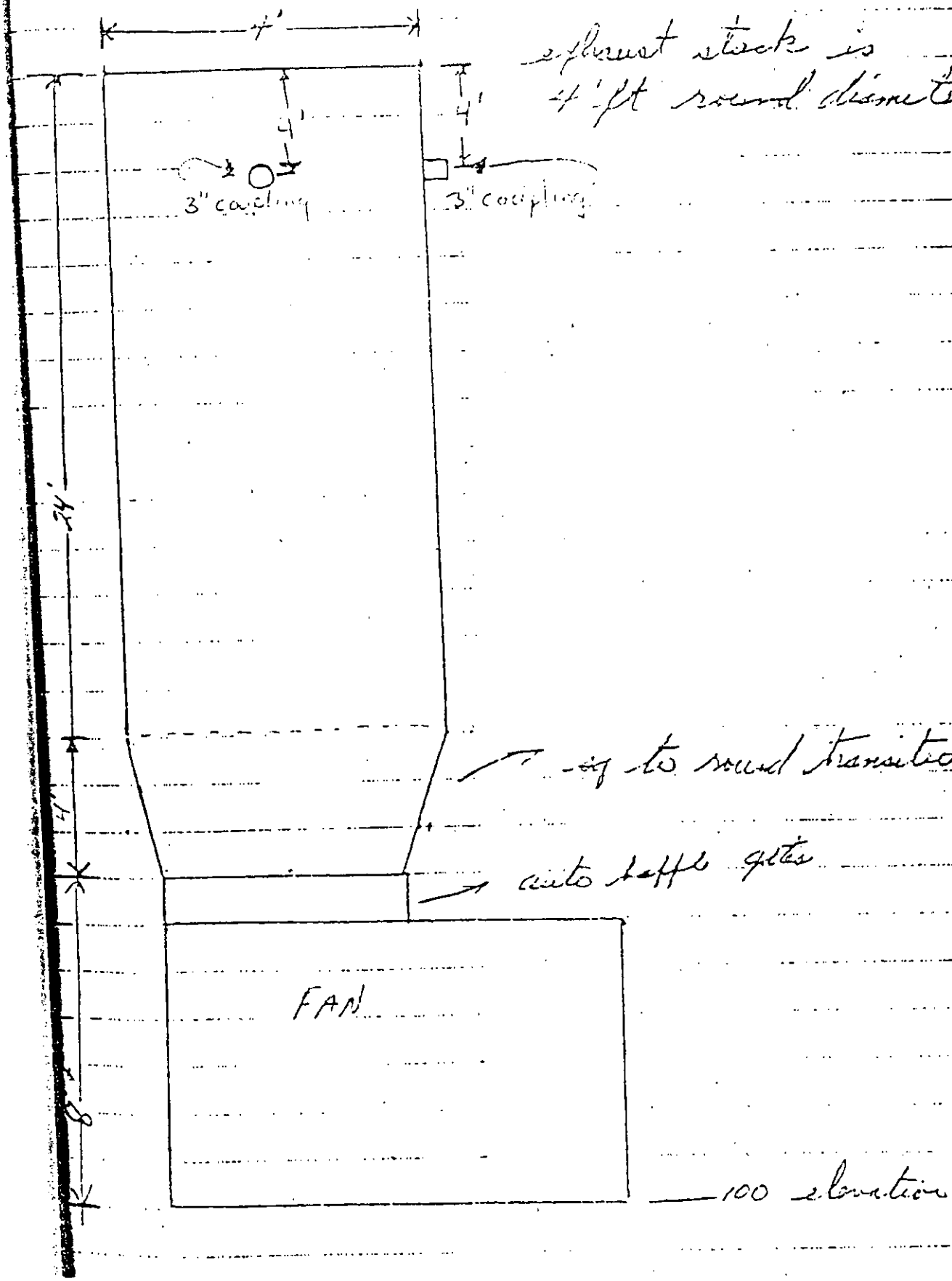
_____ ML SOLVENT		_____ G		_____ G	
200 ML WATER		0.0008 G		0.0008	
100 ML ACETONE		0.0008 G	0.0016 G	0.0008 G	0.0016 G

TAL WEIGHT
+B+C+D-F)

TOTAL PARTICULATE MATTER 0.0247 G 0.0405 G

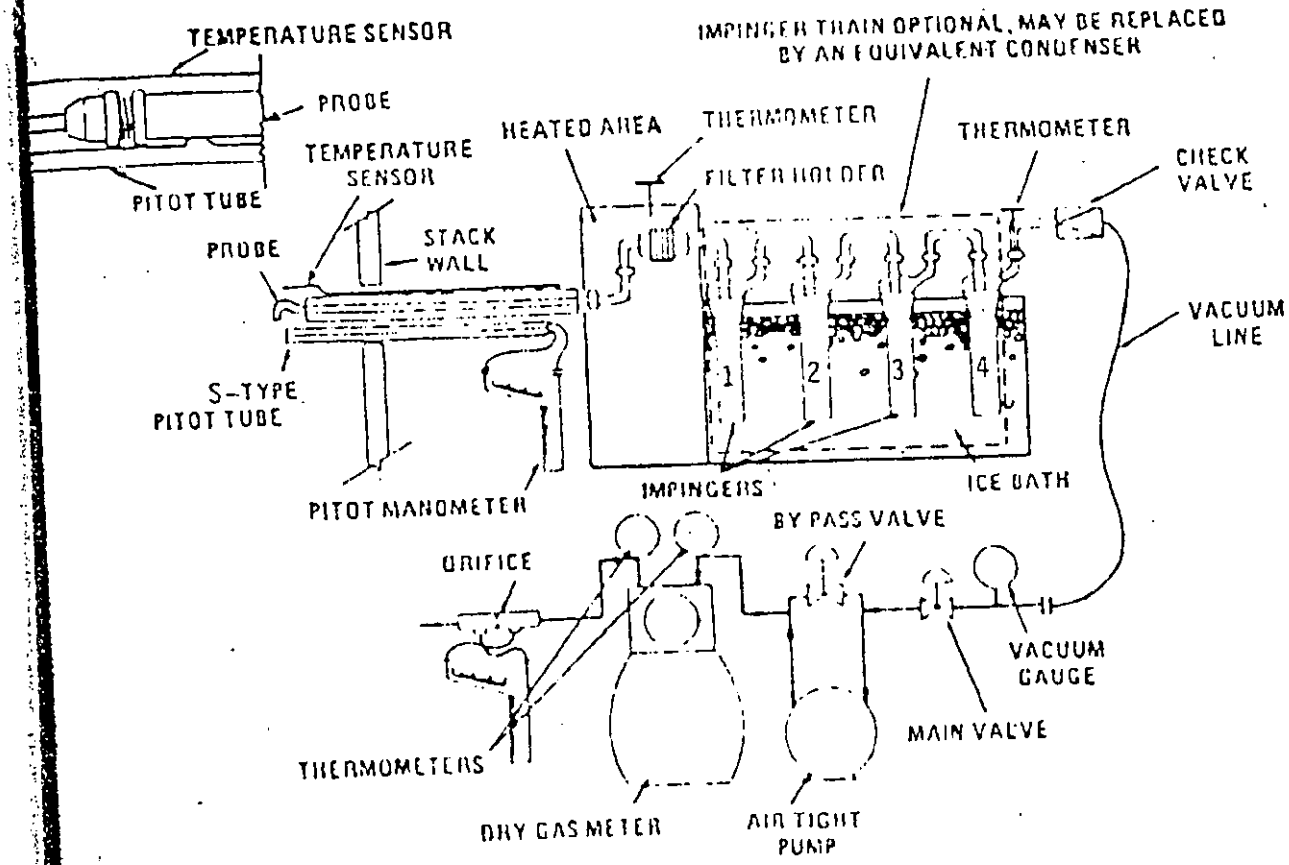
CONDENSED MOISTURE	IMPINGER #1	252 ML		164 ML
	IMPINGER #2	42 ML		18 ML
	IMPINGER #3	5 ML		2 ML
DRI-RITE	FINAL	242.3 G		240.6
	TARE	227.7 G	14.6 G	226.9 − 13.7
	TOTAL H_2O	313.6 ML+G		197.7

haust stack and fan housing R.E. Hazard Co.



exhaust stack is 4' ft round diameter

Particulate Sampling Train



Legend

Greenberg-Smith Type Impingers

No. 1 - Modified - 100 ml DI H_2O
No. 2 - Standard - 100 ml DI H_2O
No. 3 - Modified - Dry
No. 4 - Modified - x 200 gm Silica Gel