

AP42 Section: 11.1

Reference Number: 279

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

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

August 26, 1992.



AP-42 Section 11.1
Reference
Report Sect. 4
Reference 278
219

Air Pollution Cor
Brian P. Bilbray
George F. Bailey
Susan Golding District 3
Leon L. Williams District 4
John MacDonald District 5

Air Pollution Control Officer
R. J. Sommerville

October 1, 1992

Attn: Plant Supervisor
R.E. Hazard Construction
P.O. Box 229000
San Diego, CA 92129

SUBJECT: RENEWAL TEST REPORTS

The enclosed test reports are the result of testing done at your facilities.

If you have any questions, please call me at (619) 694-3359.


Robert Yelenosky
Senior Air Pollution Chemist

CWR:jo

Enclosures

R.E. HAZARD on 8/26/92
SAN DIEGO AIR POLLUTION CONTROL DISTRICT, 9150 CHESAPEAKE DRIVE, SAN DIEGO, CA. 92123
SOURCE TEST OF PARTICULATE EMISSIONS TO THE ATMOSPHERE

P.O.#442 TEST #92239

TEST SITE: R.E. Hazard
10050 Black Mountain Road
San Diego, CA 92126

TEST #: 92239

P.O.#: 442

TEST DATE: 8/26/92

Type of plant (Asphalt/Perlite/Combustion): ASPHALT

UNIT TESTED: Baghouse
EQUIPMENT: Asphalt Batch Plant

TESTED BY: David N. Shina & Guy Alphin III	DATE: 8/26/92
SITE PERSONNEL: Al Tilley	DATE: 8/26/92
APCD ENGINEER: Austen D'Lima & John McCafferty	DATE: 8/26/92
LAB ANALYSIS BY: David N. Shina	DATE: 9/3/92
REPORT BY: David N. Shina	DATE: 9/3/92
REVIEWED BY: <i>[Signature]</i>	DATE: 9/30/92
APPROVED BY: <i>[Signature]</i>	DATE: 9/30/92

ROBERT YELENOSKY, SENIOR AIR POLLUTION CHEMIST

This report has been reviewed and found to be representative of the testing that was performed.

SDAPCD RULES

TEST	LIMIT	MEASURED	EXCEEDANCE/NON-EXCEEDANCE
RULE 54 DUST & FUMES	40 lbs/hr	6.935 lbs/hr	NON-EXCEEDANCE

TEST RESULTS SUMMARY:

ITEM	I	Cs	E
UNITS	%	gr/dscf	lbs/hr
VALUE	104	0.0251	6.94

ENGINEERING SUMMARY

Qstd	Fuel	RATE	Asphalt Production
dscfm	—		tons/hr
32194	NAT GAS		229

TEST PARAMETERS:

SYSTEM DESCRIPTION:

This asphalt plant combines crushed rock and sand with asphalt oil in batch loads of varying sizes. The rock and sand are heated in a rotary drum to dry them. The exhaust from this dryer is routed through a baghouse and finally to a stack. It is the emissions from this stack that are the subject of this report.

PROCEDURES:

The procedures utilized in these tests are based on EPA's 40 CFR, July 1, 1991, Part 60, Appendix A, Methods 1-5 inclusive. The sampling train was modified to utilize a back-end filter (fig. 1), as outlined in the SDAPCD QA manual.

CALCULATIONS

All equations are from the EPA's 40 CFR, July 1, 1991, Part 60, Appendix A, Methods 1-5 inclusive. All preliminary assumptions and calculations are based on data obtained from previous tests.

PARTICULATE SAMPLING:

The test consisted of sampling at 24 traverse points, 12 from each of 2 sample ports (fig.2), collected from 77 inches below the stack (fig.3). All field data was transferred to the computer printout. All calculations were done by the computer and the emissions were compared to rule 24 of the SDAPCD.

ANALYSES:

Gas: An integrated bag sample was collected during the test and analyzed at the APCD lab.

Particulate: All procedures follow EPA guidelines, except where noted in the SDAPCD QA manual.

EQUIPMENT:

All testing and analysis equipment was calibrated according to EPA guidelines (40 CFR, July 1, 1991, Part 60, Appendix A, Methods 1-5).

Analysis:

CO2-Anarad AR400
O2-Teledyne Ryan 320 P4
Macrobalance-Sargent Welch
Microbalance-Sartorius

Collection:

Filter-Gelman
Holder-Gelman
Beakers-Pyrex
Impingers-Ace

Sampling:

L/S Box-Napp
Umbilical cord-Napp
Cold/Hot box-Napp
Pitot tube-Napp

Temp./Press.:

Thermocouples-Omega
Temp. read out-Omega
Aneroid Barometer-Taylor
Press. devices-Dwyer magnehelic

FIELD DATA:

Trav. Pt	Vm (ft ³) 807.220	ΔP (in H ₂ O)	ΔH (in H ₂ O)	Stack Temp (°F)	Box Temp (°F)	Imp Temp (°F)	t 1 (in) (°F)	t 2 (out) (°F)	velocity (ft/sec)
1		1.44	1.70	212		63	81.00	101.00	079.95
2		1.70	2.00	212		58	80.00	102.00	086.87
3		1.62	1.90	200		58	79.00	103.00	084.04
4		1.51	1.70	210		61	81.00	108.00	081.75
5		1.13	1.30	213		61	81.00	110.00	070.88
6		0.85	1.00	212		61	81.00	111.00	061.43
7		0.66	0.75	212		61	82.00	112.00	054.94
8		0.68	0.80	208		62	84.00	113.00	054.70
9		0.62	0.70	210		61	84.00	113.00	052.36
10		0.63	0.73	211		63	85.00	114.00	052.84
11		0.70	0.80	213		63	85.00	115.00	055.78
12		0.63	0.73	212		65	85.00	115.00	052.88
1		1.00	1.15	216		64	86.00	109.00	066.82
2		1.05	1.20	215		64	87.00	108.00	068.42
3		1.11	1.30	215		65	87.00	111.00	070.35
4		1.13	1.30	215		65	87.00	113.00	070.98
5		1.13	1.30	215		65	87.00	113.50	070.98
6		1.22	1.40	216		64	87.50	116.00	073.81
7		1.31	1.50	217		62	87.00	116.00	076.54
8		1.42	1.65	222		66	87.50	118.00	079.98
9		1.48	1.70	210		60	87.50	118.50	081.30
10		1.63	1.90	218		61	88.00	119.00	085.44
11		1.82	2.10	219		61	88.00	119.50	090.35
12	846.808	1.88	2.20	221		61	88.50	120.00	091.96

	Vm ft ³	ΔP (in H ₂ O)	ΔH (in H ₂ O)	ts (°F)	tbox (°F)	ti (°F)	t 1 (in) (°F)	t 2 (out) (°F)	vs (ft/sec)
Average:	39.388	1.15	1.37	214	N/A	62	84.92	112.52	71.47

DATA SUMMARY:

LABORATORY DATA:	SAMPLING PARAMETERS:	SAMPLING DATA:
IMPINGER CATCH: Silica gel ? = <u>YES</u> Vlc = <u>238.69</u> ml	METER BOX: Box ID = <u>C138</u> ΔH@ = <u>1.8883</u> Y = <u>0.9924</u>	VOLUME & TIME: Ø (total time) = <u>60.0</u> min Final leak rate = <u>0.001</u> cfm Pass/Fail = <u>PASS</u> Vm = <u>39.388</u> ft ³
GAS ANALYSIS: CO ₂ = <u>2.50</u> % O ₂ = <u>14.90</u> % CO = <u>0.00</u> % N ₂ = <u>82.60</u> %	STACK DIMENSIONS: Circular ? = <u>YES</u> Ds = <u>4.00</u> ft Length = <u>N/A</u> ft As = <u>12.56</u> ft ²	PRESSURES: Pbar = <u>29.73</u> in Hg Pg = <u>0.80</u> in H ₂ O Vpw @ ts = <u>29.92</u> in Hg Vpw @ ti = <u>N/A</u> in Hg
PARTICULATE ANALYSIS: mn(front) = <u>0.023708</u> g mn(back) = <u>0.036292</u> g mn(total) = <u>0.06000</u> g	NOZZLE & PROBE Dn = <u>0.205</u> in An = <u>0.0330</u> in ² Cp = <u>0.8435</u>	TEMPERATURES: t1 = <u>84.92</u> °F ti = <u>62</u> °F t2 = <u>112.52</u> °F tbox = <u>N/A</u> °F tm = <u>98.72</u> °F ts = <u>214</u> °F

CALCULATIONS:**TEMPERATURES:**

01)	$T_s = (2 \cdot T_{sh}) / \text{total } n's$	214 °F
02)	$T_s = T_s + 460$	674 °R
03)	$T_m = (2 \cdot [(T_1 + T_2) / 2] / \text{total } n's = (T_1 + T_2) / 2$	99 °F
04)	$T_m = (T_1 + T_2) / 2 + 460$	559 °R
05)	$T_d = (2 \cdot T_{hd}) / \text{total } n's$	62 °F
06)	T_{std}	528 °R

PRESSURES:

07)	$P_{bar} = [P @ 5.1'] - \text{if above 5.1' } [-0.1 \text{ in Hg/100ft}]$	29.73 in Hg
08)	$P_g = \text{read from pressure sensing device}$	0.80 in H ₂ O
09)	$P_s = P_{bar} + (P_g / 13.6)$	29.79 in Hg
10)	ΔH	1.37 in H ₂ O
11)	$P_m = P_{bar} + (\Delta H / 13.6)$	29.83 in Hg
12)	P_{std}	29.92 in Hg
13)	ΔP	1.1475 in H ₂ O

VOLUME:

14)	$V_m = V_{m(\text{end})} - V_{m(\text{begin})}$	39.388 ft ³
15)	Y	0.8824
16)	$V_m = V_m \cdot Y$	39.069 ft ³
17)	$V_m \text{ std} = [(V_m \cdot (T_{std} / T_m) \cdot (P_m / P_{std}))]$	36.829 ft ³
18)	$V_{low} = \text{Volume of impurities}$	236.89 ml
19)	ρ	0.002201 lb/ml
20)	R	21.85 in Hg-ft ³ /°R-lb-mo
21)	M_{wH_2O}	18.00 g/g-mo
22)	$V_w \text{ std} = [(V_{low} \cdot \rho \cdot R \cdot T_{std}) / (P_{std} \cdot M_{wH_2O})]$	1.2351 ft ³

MOISTURE:

23)	$Bws(1) = (V_w \text{ std}) / (V_w \text{ std} + V_m \text{ std}) \cdot 100$	23.38 %
24)	$V_{pw} @ T_s = \text{from appendix}$	29.92 in Hg
25)	$Bws(2) = [(V_{pw} @ T_s) / P_s] \cdot 100$	100.44 %
26)	$Bws = \text{lower value of equation 24 or 26}$	23.38 %

MOLECULAR WEIGHT:

27)	%O ₂	14.90 %
28)	%CO ₂	2.50 %
29)	%N ₂ +Inerts+%CO	82.60 %
30)	$M_d = 0.440[\%CO_2] + 0.320[\%O_2] + 0.280[\%N_2 + \text{Inerts} + \%CO]$	29.00 g/g-mole
31)	$M_s = M_d \cdot (1 - Bws) + 18.0 \cdot (Bws)$	26.43 g/g-mole

VELOCITY:

32)	C_p	0.844
33)	$D_s =$	4.000 ft
34)	$v_s = 85.49 \cdot C_p \cdot [(T_s \cdot \Delta P) / (P_s \cdot M_d)]^{.5}$	71.475 ft/sec
35)	$A_s = 3.14 \cdot [(D_s)^2 / 4]$	12.560 ft ²
36)	$Q_s = (v_s) \cdot A_s \cdot 60$	53863 acfm
37)	$Q_{std} = 17.64 \cdot Q_s \cdot (1 - Bws) \cdot P_s / T_s$	32194 dscfm

EMISSIONS:**FRONT HALF**

38)	$m_n (\text{front})$	0.02371 g
39)	$C_s (\text{front}) = 15.43 \cdot m_n (\text{front}) / V_m \text{ std}$	0.00993 grains/dscf
40)	$7000 \text{ grains} = 1 \text{ lb. } 60 \text{ min} = 1 \text{ hr. } 60 \text{ min/hr} / 7000 \text{ grains/lb} =$	0.00857 lbs-min/grains-hr
41)	$E (\text{front}) = (0.00857) \cdot (Q_{std}) \cdot C_s (\text{front})$	2.74 lbs/hr

BACK HALF

42)	$m_n (\text{back})$	0.03629 g
43)	$C_s (\text{back}) = 15.43 \cdot m_n (\text{back}) / V_m \text{ std}$	0.01520 grains/dscf
44)	$7000 \text{ grains} = 1 \text{ lb. } 60 \text{ min} = 1 \text{ hr. } 60 \text{ min/hr} / 7000 \text{ grains/lb} =$	0.00857 lbs-min/grains-hr
45)	$E (\text{back}) = (0.00857) \cdot (Q_{std}) \cdot C_s (\text{back})$	4.20 lbs/hr

TOTAL

46)	$m_n (\text{total}) = m_n (\text{front}) + m_n (\text{back})$	0.06000 g
47)	$C_s (\text{total}) = 15.43 \cdot m_n (\text{total}) / V_m \text{ std}$	0.02514 grains/dscf
48)	$7000 \text{ grains} = 1 \text{ lb. } 60 \text{ min} = 1 \text{ hr. } 60 \text{ min/hr} / 7000 \text{ grains/lb} =$	0.00857 lbs-min/grains-hr
49)	$E (\text{total}) = (0.00857) \cdot (Q_{std}) \cdot C_s (\text{total})$	6.94 lbs/hr

ISOKINETICS:

50)	$D_n =$	0.205 in
51)	$A_n = 3.14 \cdot [(D_n)^2 / 4]$	0.0330 in ²
52)	ϕ	60 min
53)	$I = 0.9450 \cdot (T_s \cdot V_m \text{ std}) / (P_s \cdot v_s \cdot A_n \cdot (1 - Bws))$	104.50 % = 104 %

R.E. Hazard on 8/26/92

P.O. #:442 TEST#: 92239

SAN DIEGO AIR POLLUTION CONTROL DISTRICT, 9150 CHESAPEAKE DRIVE, SAN DIEGO, CA 92123

PARTICULATE TEST LABORATORY ANALYSIS DATA SHEET

TEST SITE: RE HAZARD

10050 Black Mountain Road
San Diego, CA 92126

TEST #: 92239

P.O.#: 442

TEST DATE: 8/26/92

LAB ANALYSIS BY: David N. Shina

DATE: 9/3/92

LAB REPORT BY: David N. Shina

DATE: 9/3/92

REVIEWED BY:

DATE:

(1) IMPINGER VOLUMES

	FINAL WGT.	INIT WGT.	NET WGT.	
#1	744.15 g	574.05 g	170.10 g	
#2	618.70 g	573.88 g	44.82 g	
#3	496.56 g	485.97 g	10.59 g	
#4	644.90 g	631.72 g	13.18 g	
#5	g	g	N/A g	
#6	g	g	N/A g	

Total impinger charge= 200.00 ml
 Particulates from impinger charge
 (Total impinger charge * H(water blank) = 0.00013 g
 Total weight collected= 238.69 g
 Total volume collected, Vlc= 238.69 ml

(2) BLANKS

A	B	C	D	E	F	G	H	I	J	K	L
AREA	SOLVENT	ID	END WGT g	INIT WGT g	NET WGT. (E-F) g	RINSES ml	g/ml (G/D)	% (H*100)	ppm (J*10 ⁶)	PASS FAIL	LIMITS
BLANK	ACETONE	92025	49.4864	49.4837	0.00270	325.00	0.0000083	0.0008308	8.3	P	0.0010%=10ppm
BLANK	WATER	92001	30.8198	30.8196	0.00020	300.00	0.0000007	0.0000667	0.7	P	0.0004%=4ppm
BLANK	ORGANIC	N/A									

(3) WEIGHTS & RINSES

a	b	c	d	e	f	g	h	i	j	k
AREA	SOLVENT	ID	END WGT g	INIT. WGT g	NET WGT. (e-f) g	RINSES ml	SOLV. WGT (g*H) g	WGT (corr) (f-h) g	Subtotal (mn (AREA)) (Σj) g	Total (mn (tot)) (Σk) g
F R O N T	ACETONE	92086	29.3092	29.2998	0.0094	300.00	0.002492	0.00691		
	WATER	92078	28.8605	28.8435	0.0170	300.00	0.000200	0.01680		
	ORGANIC	N/A								
	FILTER	N/A								
mn(front) =									0.023708 g	
B A C K	ACETONE	92084	29.2592	29.2421	0.0171	330.00	0.002742	0.01436		
	WATER **	92003	30.2476	30.2254	0.0222	350.00	0.000367	0.02183		
	ORGANIC	N/A								
	FILTER	92099	1.6008	1.6007	0.0001	-----	-----	0.00010		
mn(back) =									0.036292 g	
TOTAL									mn(total) = 0.06000 g	

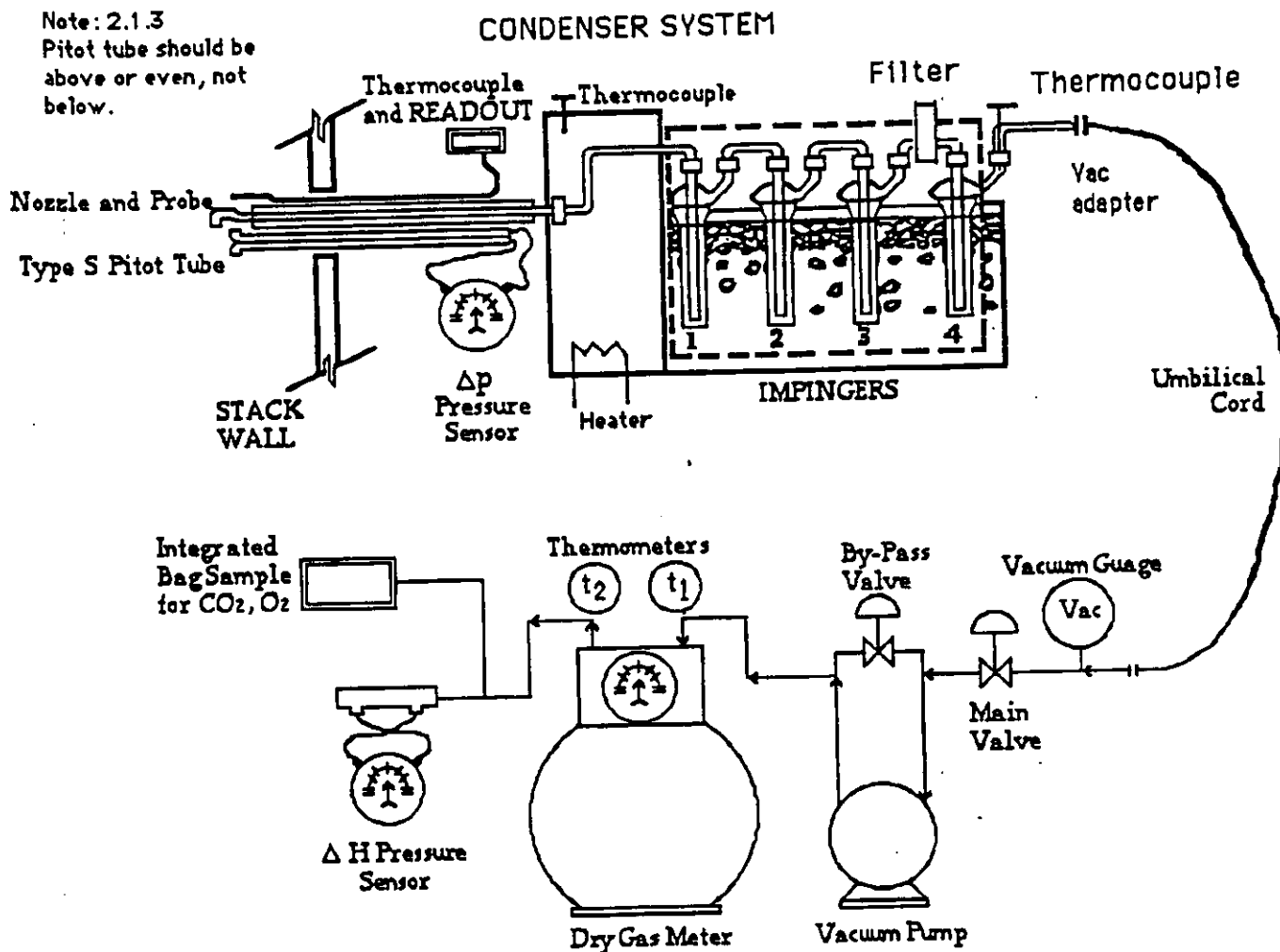
** The Back Water-SOLV.WGT is corrected for the initial impinger charge

([g(back water) * H(blank water)] + [Particulates from impinger charge]).

SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT

FIGURE

CONDENSER SYSTEM



LEGEND

- No. 1 Mod- 100 ML Deionized Water
- No. 2 Std - 100 ML Deionized Water
- No. 3 Mod- Dry
- No. 4 Mod- Silica gel
- Mod - Modified Type Greenburg-Smith
- Std - Standard Type " "

FIELD DATA ABBREVIATIONS

- PT = Point Number
- T_s = Stack Temperature
- Δp = Pitot Tube Pressure Differential, in H₂O
- V_s = Stack Velocity, fps
- ΔH = Orifice Meter Pressure Drop, in H₂O
- t₁ = Meter Inlet Temperature, °F
- t₂ = Meter Outlet Temperature, °F
- P_m = Pump Vacuum, in Hg
- t_i = Impinger Temperature
- P_{bar} = Barometric Pressure

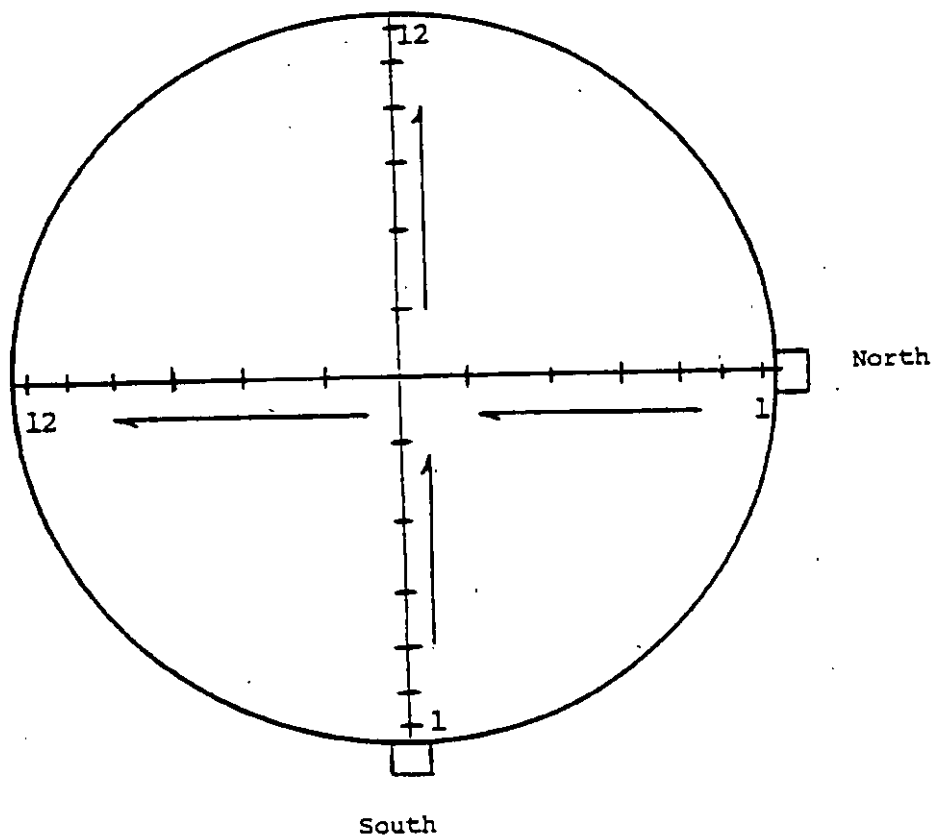
FIGURE : PARTICULATE MATTER SAMPLING TRAIN

TEST NO.

SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT

TRAVERSE POINTS

STACK DIAMETER 48"



POINT	DISTANCE	POINT	DISTANCE
1	47.0"	7	17.1"
2	44.8"	8	12.0"
3	42.3"	9	8.5"
4	39.5"	10	5.7"
5	36.0"	11	3.2"
6	30.9"	12	1.0"

FIGURE 2

SITE DESCRIPTION
HAZARD ASPHALT

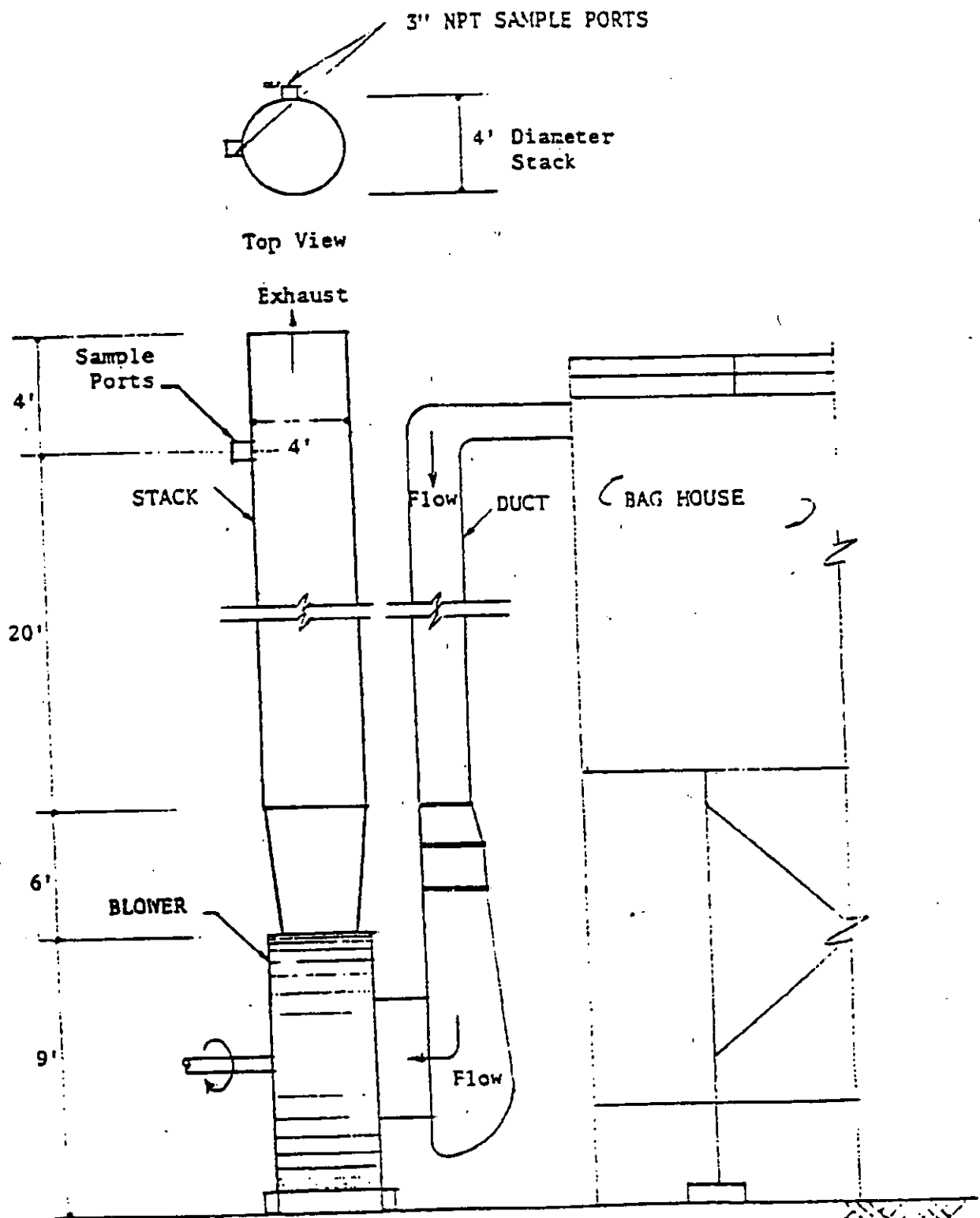


FIGURE 3

SIZE VIEW, No Scale

NOMENCLATURE

symbol	units	explanation	equation
A			
An	in ²	nozzle area	$\pi/4(D_n)^2$
As	ft ²	stack area	$\pi/4(D_s)^2$ or LxW
B			
Bws(1)	%	fractional stack gas moisture-equ 1	$((V_w \text{ std})/(V_w \text{ std} + V_m \text{ std}))100$
Bws(2)	%	fractional stack gas moisture-equ 2	$((V_{pw} @ ts)/P_s)100$
Bws	%	water vapor in the gas stream	lower of Bws(1) and Bws(2)
C			
CO	%	carbon monoxide	read from measuring device (0 for Asphalt plants)
CO2	%	carbon dioxide	read from measuring device
Corr Vwm	ft ³	correction for Vw w/o silica gel	$((V_m * (V_{pw} @ ts) / P_s) * P_m * T_{std}) / (T_m * P_{std})$
Cp	none	pilot tube correction factor	see EPA method 3
Cs(front)	gr/dscf	concentration of particulate in stack gas, corrected to STP for front	$(15.43 * mn(\text{front})) / (V_m \text{ std})$
Cs(back)	gr/dscf	concentration of particulate in stack gas, corrected to STP for back	$(15.43 * mn(\text{back})) / (V_m \text{ std})$
Cs(total)	gr/dscf	concentration of particulate in stack gas, corrected to STP for total	$(15.43 * mn(\text{total})) / (V_m \text{ std})$
Cs12(front, back, total)		same as Cs(front, back, total) except corrected for grain loading at 12% CO2	$(12 / \%CO_2) * (15.43 * mn(\text{fr, back, total})) / (V_m \text{ std})$
D			
d (density)	lb/ml	density of water at STP	0.002201 (see CRC)
Ds	in or ft	stack diameter	measure at site
Dn	in	nozzle diameter	avg of at least three measurements
E			
E.A.	%	Excess air (for combustion)	$((\%CO_2 - 5\%CO) * 100) / ((254 * \%N_2 - \%O_2 - 5 * \%CO))$
E(front)	lbs/hr	part. emissions rate-front	$(0.00857)(Q_s d * C_s(\text{front}))$
E(back)	lbs/hr	part. emissions rate-back	$(0.00857)(Q_s d * C_s(\text{back}))$
E(total)	lbs/hr	part. emissions rate-total	$(0.00857)(Q_s d * C_s(\text{total}))$
H			
ΔH	in H2O	average differential pressure across the orifice meter	avg of the readings from the pressure measuring device
ΔH@	none	orifice pressure differential at STP	see EPA Method 5 Appendix
I			
I	%	isokinetics	$(0.09450 * T_s * V_m \text{ std}) / [P_s * v * Q * (A_n / 144) * (1 - (Bws / 100))]$
M			
Md	g/g-mole	dry stack gas molecular wgt	$0.44(\%CO_2) + 0.320(\%O_2) + 0.280(\%N_2 + \text{inerts} + CO)$
mn(back)	g	particulate in impingers	measurement from lab analysis
mn(front)	g	particulate in nozzle & probe	measurement from lab analysis
mn(total)	g	total particulate collected	measurement from lab analysis
Ms	g/g-mole	wet stack gas molecular wgt	$Md(1 - Bws) + 18.0(Bws)$
MW CO2	g/mole	mo. wgt of carbon dioxide	44 (see periodic table)
MW N2	g/mole	mo. wgt of nitrogen	28 (see periodic table)
MW O2	g/mole	mo. wgt of oxygen	32 (see periodic table)
MW H2O	g/mole	mo. wgt of water	18 (see periodic table)
N			
N2	%	percent nitrogen	$100 - (\%CO_2 + \%O_2 + \%CO + \text{inerts})$
O			
O2	%	percent oxygen	read from measuring device

NOMENCLATURE (cont.)

MECHANICAL ENGINEERING

①

SOURCE TEST REPORT

PERMIT RENEWAL TEST

TEST DATE: WEDNESDAY, AUGUST 26, 1992TESTER: APCD; DAVID SHINA, GUY ALLPIN, ENGINEERS: JOHN MCCHEATH, AUSTEN DUMATEST: PARTICULATESAPPLICABLE RULES: SO(Q)(1), SO(Q)(2), SI, 54SOURCE: R.E. HAZARD CONTRACTING CO., 10050 BLACK MTN. RD., SAN DIEGOSITE PERSONNEL: AL TILLEY, SUPT. AND "WILLIE", OPERATORPERMIT TO OPERATE: 000442, EXPIRES NOV. 1, 1992EQUIPMENT DESCRIPTION: HOT-MIX ASPHALT BATCH PLANT, 300 TONS/HR RATED CAPACITYP/O CONDITIONS: ATTACHEDOBSERVATIONS:

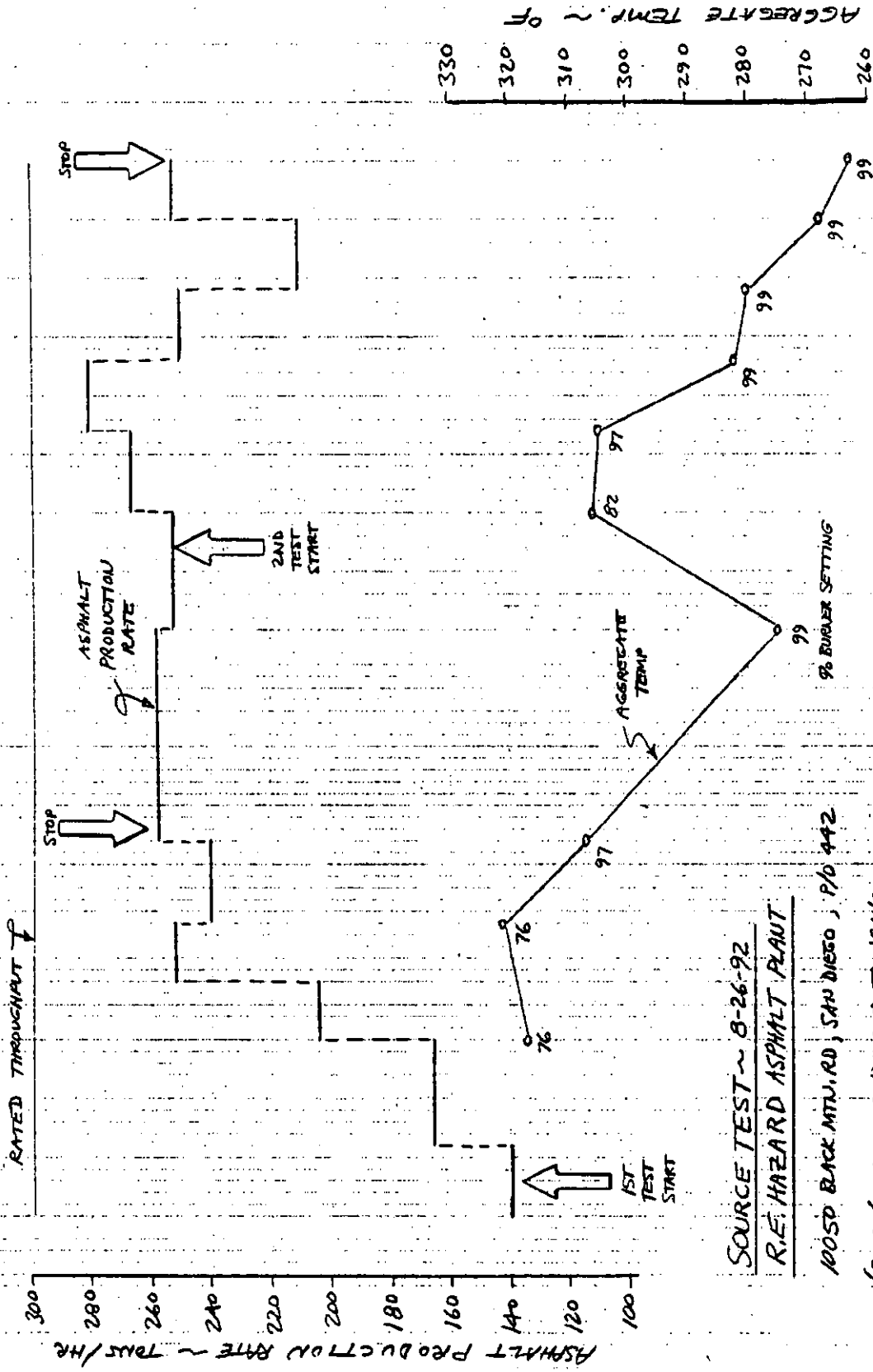
- THE RATED THROUGHPUT ON THE PERMIT IS 300 TONS/HR; DURING THE TESTS IT WAS 204 TONS/HR FOR THE FIRST (30 MIN.) TEST AND 252 TONS/HR FOR THE SECOND (33 MIN.) TEST, WITH AN AVERAGE OF 229 TONS/HR.
- THE ROTARY DRUM DRYER AGGREGATE OUTPUT TEMPERATURE DROPPED FROM 317-321°F AT THE EARLY LOW PRODUCTION RATES, TO 263-282°F AT THE FINAL HIGH PRODUCTION RATES.
- THE BLUE SMOKE EXITED THE TRUCK TUNNEL AT APPROX. 20% OMCITY. NO FAN-VENTILATION WAS OCCURRING IN THE TUNNEL.

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- THE MANHOLE LIDS ATOP THE UNDERGROUND ASPHALT OIL STORAGE TANKS HAD NO METHOD OF SEALING VAPOR; SEVERAL WERE LEAKING FUMES WITH APPROX. 20% OPACITY.
- SILO-TOP EMISSIONS AT THE DRAG-SLAT CONVEYOR WERE STEADILY VISIBLE AT APPROX 10% OPACITY.
- OCCASIONAL EMISSIONS WERE ESCAPING IN THE TOWER AREA ABOVE THE PUGMILL AND EXCEEDED 20% OPACITY.

COMMENTS:

- THIS PLANT HAS NOT DEMONSTRATED OR BEEN TESTED AT ITS RATED PRODUCTION RATE (300 TONS/HR) FOR SEVERAL YEARS. THE DRYER'S BURNER MAY BE UNDERSIZED FOR THE REMAINDER OF THE PLANT.
- NO DUST WAS OBSERVED FROM THE TRUCK TRAFFIC; ALL UNPAVED ROAD SECTIONS APPEARED TO BE DAMP OR WET.
- RULE 50(d)(2) ALLOWS 40% OPACITY SMOKE READINGS AT THE ASPHALT DROP BONE, INCLUDING THE TRUCK TUNNEL OPENINGS. OTHER FUGITIVE EMISSIONS ARE LIMITED TO 20% OPACITY BY RULE 50(d)(1); SOME OF THESE ARE CLOSE TO EXCEEDING THE RULE LIMITS.
- RULE 54 SHALL BE APPLIED TO THE RENOVAL TEST RESULTS, WHICH WILL BE IN COMPLIANCE IF THE STACK PARTICULATE EMISSIONS DO NOT EXCEED 40 LB/HR.



SOURCE TEST ~ 8-26-92
 R.E. HAZARD ASPHALT PLANT

10050 BLACK MOUNTAIN RD, SAN DIEGO, P/O 442

(START/STOP TIMES ADJUSTED TO JCM'S
 CLOCK... 4 MINUTES LESS THAN DAVID S. CLOCK)

MINUTES ~ 0	10	20	30	40	50	60	70	80	90
CLOCK TIME ~ 7:23 AM	7:33	7:43	7:53	8:03	8:13	8:23	8:33	8:43	8:53

JCM

COUNTY OF SAN DIEGO
AIR POLLUTION CONTROL DISTRICT
915 JESAPEAKE DRIVE SAN DIEGO, CA 92123-106
(619) 694-3307

68267
CONTROL NO.

PERMIT TO OPERATE

PERMIT NO.

000442

EXPIRES

NOVEMBER 1, 1991

THE FOLLOWING IS HEREBY GRANTED A PERMIT TO OPERATE THE ARTICLE, MACHINE, EQUIPMENT OR CONTRIVANCE DESCRIBED BELOW.
THIS PERMIT IS NOT TRANSFERABLE TO A NEW OWNER, NOR IS IT VALID FOR OPERATION OF THE EQUIPMENT AT ANOTHER LOCATION,
EXCEPT FOR PORTABLE EQUIPMENT.

EQUIPMENT ADDRESS

HAZARD R E CONTRACTING CO
PLANT SUPERINTENDENT
P O BOX 229000
SAN DIEGO CA 92122

10050 BLACK MTN RD
SAN DIEGO CA 92126

EQUIPMENT DESCRIPTION

REVISED COPY

FEE PAID

ASPHALT BATCH PLANT (300-TON/HR CAPACITY); STANDARD HOT MIX 8000 LB. BATCHER;
109M BTU/HR INPUT ROT-DRYER; STANDARD HAVENS BAGHOUSE, 9660 SQ FT
CLOTH AREA; 50,000 SCFM BLOWER; SUSPENDED OIL PARTICLE CONTROL; ENCLOSURE
FOR THREE (3) ASTEC HB 200 TON STORAGE SILOS; ENCLOSED CONVEYOR TO SILO
LOAD-IN AREA; THREE SILO BATCHERS; ONE 10,000 CFM BLOWER AND ASSOCIATED
VENT DUCTING TO THE PLANT KNOCK-OUT BOX. RL201/91 900119
H 00182A 000442 0139J 04A01 92A01

THIS PERMIT HAS BEEN ISSUED SUBJECT TO THE FOLLOWING CONDITIONS. FAILURE TO COMPLY WITH THESE CONDITIONS IS A MISDEMEANOR.

1. AIR POLLUTION CONTROL EQUIPMENT SHALL BE MAINTAINED IN GOOD OPERATING CONDITION AND SHALL BE IN FULL OPERATION IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AT ALL TIMES WHEN THE PROCESS EQUIPMENT IS IN OPERATION.
2. ALL PROCESS EQUIPMENT SHALL BE MAINTAINED AND OPERATED SO THAT THERE IS NO LEAKAGE OF AIR CONTAMINANTS TO THE ATMOSPHERE PRIOR TO THEIR TREATMENT IN THE AIR POLLUTION CONTROL SYSTEM.
3. ACCESS ROADS AND YARDS IN THE GENERAL AREA OF THIS EQUIPMENT SHALL BE WATERED OR OTHERWISE TREATED TO PREVENT DUST GENERATED BY PLANT MOBILE TRAFFIC FROM EXCEEDING THE EMISSION STANDARDS OF RULE 30.
4. PERMITTEE SHALL PROVIDE ACCESS, FACILITIES, UTILITIES AND ANY NECESSARY SAFETY EQUIPMENT FOR SOURCE TESTING AND INSPECTION UPON REQUEST OF THE AIR POLLUTION CONTROL DISTRICT.
5. DAILY RECORDS OF HOT MIX ASPHALT PRODUCTION AND DELIVERY RATES SHALL BE MAINTAINED AND MADE AVAILABLE TO THE DISTRICT UPON REQUEST.
5. OPERATION MUST BE IN COMPLIANCE WITH ALL INFORMATION INCLUDED IN APPLICATIONS FOR THIS PERMIT TO OPERATE, AS APPROVED BY THE DISTRICT, AND WITH ALL CONDITIONS LISTED ABOVE.

WITHIN 10 DAYS AFTER RECEIPT OF THIS PERMIT, THE APPLICANT MAY PETITION THE HEARING BOARD TO REVIEW ANY CONDITION THAT HAS BEEN MODIFIED OR ADDED TO THE PERMIT. (RULE 25 AND REGULATION VI) IN ACCORDANCE WITH RULE 10C THIS PERMIT TO OPERATE OR A COPY MUST BE POSTED ON OR WITHIN 25 FEET OF THE EQUIPMENT, OR MAINTAINED READILY AVAILABLE AT ALL TIMES ON THE OPERATING PREMISES.

ANY AND ALL CONDITIONS WHICH HAVE BEEN APPLIED TO THIS EQUIPMENT SHALL REMAIN IN FULL FORCE AND EFFECT UNLESS EXPRESSLY MODIFIED BY THE AIR POLLUTION CONTROL DISTRICT. THIS AIR POLLUTION CONTROL DISTRICT PERMIT DOES NOT RELIEVE THE HOLDER FROM OBTAINING PERMITS OR AUTHORIZATIONS WHICH MAY BE REQUIRED BY OTHER GOVERNMENTAL AGENCIES.



R.J. Sommerville

AIR POLLUTION CONTROL OFFICER

DASHIN
8/26/98

P.O. #442
TEST # 041
72234

R.E. HAZARD

(1) IMPANGERS:

DATE	NO	CONTENTS	WGT	DATE	WGT	DIFF
8/25	1	100 mL H ₂ O	574.15	8/26	744.15 618.30	170.10
	2	100 mL H ₂ O	573.88		446.56	44.42
	3	MT	483.97		644.40	10.54
	4	MT	631.72			13.18

TOTAL = 200ML

TOTAL = 238.64

(2) GAS ANALYSIS:

CO₂: Around AR400 : #1 = 2.6%, #2 = 2.5%, #3 = 2.5%, AVG = 2.5%
O₂: Tekdyne : #1 = 14.9%, #2 = 14.9%, AVG = 14.9%

(3) CP:

OP (above) = 1.01 CP (above) = .8452
AP (above) = 1.15 CP (below) = .8337
OP (below) = 1.45

$$\left\{ \frac{(1.15 - 1.01)}{(1.45 - 1.01)} \right\} \times (.8337 - .8452) + .8452 = .8435$$

(4) WGT'S: CAPSULES

BLANKS:	ID	RUNSES	TARE	#1	#2	#3	AVG
Acetone	(92025)	250+75	444837	49.9808	4864	4864	49.4864
Water	(92001)	250+50	30.8146	30.8146	.8198	.8198	30.8198
FRONT							
Ac	(92086)	250+50	24.2948	24.3012	.3042	.3042	24.3012
Water	(92078)	250+50	20.8435	24.8605	.8605	.8605	24.8605
BACK							
Ac	(92084)	280+50	24.2421	24.2590	.2592	.2592	24.2592
Water	(92003)	300+50	30.2254	30.2477	.2475	.2477	30.2476
FILTER							
Back	(92004)	—	1.6007	1.6008	1.6008	1.6008	1.6008

??SITE NAME?? on ??TEST DATE??
 SAN DIEGO AIR POLLUTION CONTROL DISTRICT, 9150 CHESAPEAKE DRIVE, SAN DIEGO, CA. 92123
 SOURCE TEST OF PARTICULATE EMISSIONS TO THE ATMOSPHERE
 TEST SITE: RE hazard

TEST #:	P.O.#:	TEST DATE:
Type of plant (Asphalt/Perlite/Combustion): ASPHALT		
UNIT TESTED:		
EQUIPMENT:		
TESTED BY:	DATE:	
SITE PERSONNEL:	DATE:	
APCD ENGINEER:	DATE:	
LAB ANALYSIS BY:	DATE:	
REPORT BY:	DATE:	
REVIEWED BY:	DATE:	
APPROVED BY:	DATE:	

ROBERT YELENOSKY, SENIOR AIR POLLUTION CHEMIST

This report has been reviewed and found to be representative of the testing that was performed.

SDAPCD RULES

TEST	LIMIT	MEASURED	EXCEEDANCE/NON-EXCEEDANCE
RULE 54 DUST & FUMES	40 lbs/hr	6.928 lbs/hr	NON-EXCEEDANCE

TEST RESULTS SUMMARY:

ITEM	I	Cs	E
UNITS	%	gr/dscf	lbs/hr
VALUE	105	0.0251	6.93

ENGINEERING SUMMARY

Qstd	Fuel	Fuel Rate	Asphalt Production
dscfm	type	CFH	tons/hr
32201			

TEST PARAMETERS:

SYSTEM DESCRIPTION:

This asphalt plant combines crushed rock and sand with asphalt oil in batch loads of varying sizes. The rock and sand are heated in a rotary drum to dry them. The exhaust from this dryer is routed through a baghouse and finally to a stack. It is the emissions from this stack that are the subject of this report.

PROCEDURES:

The procedures utilized in these tests are based on EPA's 40 CFR, July 1, 1991, Part 60, Appendix A, Methods 1-5 inclusive. The sampling train was modified to utilize a back-end filter (fig. 1), as outlined in the SDAPCD QA manual.

CALCULATIONS

All equations are from the EPA's 40 CFR, July 1, 1991, Part 60, Appendix A, Methods 1-5 inclusive. All preliminary assumptions and calculations are based on data obtained from previous tests.

PARTICULATE SAMPLING:

The test consisted of sampling at 24 traverse points, 12 from each of 2 sample ports (fig.2), collected from ?? inches below the stack (fig.3). All field data was transferred to the computer printout. All calculations were done by the computer and the emissions were compared to rule ?? of the SDAPCD.

ANALYSES:

Gas: An integrated bag sample was collected during the test and analyzed at the APCD lab.

Particulate: All procedures follow EPA guidelines, except where noted in the SDAPCD QA manual.

EQUIPMENT:

All testing and analysis equipment was calibrated according to EPA guidelines (40 CFR, July 1, 1991, Part 60, Appendix A, Methods 1-5).

Analysis:

CO2-Anarad AR400
 O2-Teledyne Ryan 320 P4
 Macrobalance-Sargent Welch
 Microbalance-Sartorius

Collection:

Filter-Gelman
 Holder-Gelman
 Beakers-Pyrex
 Impingers-Ace

Sampling:

L/S Box-Napp
 Umbilical cord-Napp
 Cold/Hot box-Napp
 Pitot tube-Napp

Temp./Press.:

Thermocouples-Omega
 Temp. read out-Omega
 Aneroid Barometer-Taylor
 Press. devices-Dwyer magnohelic

FIELD DATA:

Trav. Pt	Vm (ft ³)	ΔP (in H ₂ O)	ΔH (in H ₂ O)	Stack Temp (°F)	Box Temp (°F)	Imp Temp (°F)	t 1 (in) (°F)	t 2 (out) (°F)	velocity (ft/sec)
START	807.220								
		1.448	1.700	212		63	81.00	101.00	079.89
		1.700	2.000	212		58	80.00	102.00	086.81
		1.620	1.900	200		68	79.00	105.00	083.98
		1.510	1.700	210		61	81.00	108.00	081.69
		1.138	1.308	212		61	81.00	110.00	070.63
		0.850	1.000	212		61	81.00	111.00	061.38
		0.650	0.750	212		61	82.00	112.00	053.68
		0.680	0.800	206		62	84.00	113.00	054.66
		0.620	0.700	210		61	84.00	112.00	052.35
		0.630	0.730	211		63	85.00	114.00	052.81
		0.700	0.800	213		63	85.00	115.00	055.74
		0.630	0.730	212		65	85.00	115.00	052.84
		1.000	1.150	218		64	88.00	109.00	066.78
		1.050	1.200	215		64	87.00	108.00	068.37
		1.110	1.200	215		65	87.00	111.00	070.30
		1.130	1.300	215		65	87.00	113.00	070.93
		1.130	1.300	215		65	87.00	113.50	070.93
		1.220	1.400	216		64	87.50	116.00	073.76
		1.310	1.500	217		62	87.00	116.00	076.40
		1.420	1.650	222		66	87.50	118.00	079.93
		1.480	1.780	218		60	87.50	118.50	081.24
		1.630	1.900	218		61	88.00	119.00	085.38
		1.820	2.100	219		61	88.00	119.50	090.28
	846.608	1.880	2.200	221		61	88.50	120.00	091.90

	Vm ft ³	ΔP (in H ₂ O)	ΔH (in H ₂ O)	ts (°F)	tbox (°F)	ti (°F)	t1 (in) (°F)	t2 (out) (°F)	vs (ft/sec)
Average:	39.388	1.146	1.367	214	na	62	84.92	112.52	71.37

DATA SUMMARY:

LABORATORY DATA:	SAMPLING PARAMETERS:	SAMPLING DATA:
IMPINGER CATCH: Silica gel ? = <u>YES</u> Vlc = <u>238.69</u> ml	METER BOX: Box ID = <u>c138</u> ΔH@ = <u>1.8883</u> Y = <u>0.9924</u>	VOLUME & TIME: Ø (total time) = <u>60.0</u> min Final leak rate = <u>0.001</u> cfm Pass/Fail = <u>PASS</u> Vm = <u>39.388</u> ft ³
GAS ANALYSIS: CO ₂ = <u>2.50</u> % O ₂ = <u>14.90</u> % CO = <u>0.00</u> % N ₂ = <u>82.60</u> %	STACK DIMENSIONS: Circular ? = <u>YES</u> Ds = <u>4.00</u> ft Length = <u>N/A</u> ft As = <u>12.56</u> ft ²	PRESSURES: Pbar = <u>29.77</u> in Hg Pg = <u>0.80</u> in H ₂ O Vpw @ ts = <u>29.9200</u> in Hg Vpw @ ti = <u>N/A</u> in Hg
PARTICULATE ANALYSIS: mn(front) = <u>0.023708</u> g mn(back) = <u>0.036292</u> g mn(total) = <u>0.06000</u> g	NOZZLE & PROBE Dn = <u>0.205</u> in An = <u>0.0330</u> in ² Cp = <u>0.8435</u>	TEMPERATURES: t1 = <u>84.92</u> °F ti = <u>62</u> °F t2 = <u>112.52</u> °F tbox = <u>na</u> °F tm = <u>98.72</u> °F ts = <u>214</u> °F

CALCULATIONS:

TEMPERATURES:

01)	$T_s = (\sum t_i n_i) / \text{total } n_i$	214 °F
02)	$T_s = t_s + 460$	674 °R
03)	$T_m = (\sum (t_1 t_2) + 2 t_1 t_2) / 2 / \text{total } n_i = (t_1 + t_2) / 2$	98 °F
04)	$T_m = (t_1 + t_2) / 2 + 460$	559 °R
05)	$T_s = (\sum t_i n_i) / \text{total } n_i$	62 °F
06)	T_{std}	528 °R

PRESSURES:

07)	$P_{bar} = (P @ S.L.) + [ft. \text{ above S.L.} * (-0.1 \text{ in Hg} / 1000)]$	29.77 in Hg
08)	$P_g = \text{read from pressure sensing device}$	0.80 in H2O
09)	$P_s = P_{bar} + [P_g / 13.6]$	29.83 in Hg
10)	ΔH	1.37 in H2O
11)	$P_m = P_{bar} + (\Delta H / 13.6)$	29.87 in Hg
12)	P_{std}	29.92 in Hg

VOLUME & MOISTURE:

13)	$V_m = V_{m \text{ end}} - V_{m \text{ begin}}$	39.388 ft^3
14)	Y	0.9924
15)	$V_m = V_m * Y$	39.089 ft^3
16)	$V_m \text{ std} = [(V_m * (T_{std} / T_m) * (P_m / P_{std}))]$	38.878 ft^3
18)	$V_{ic} = (\sum \text{Volume of Impingers})$	238.69 ml
20)	ρ	0.002201 lb/ml
21)	R	21.85 in Hg-ft^3/°R-lb-mo
22)	M_{wH2O}	18.00 g/g-mo
23)	$V_w \text{ std} = [(V_{ic} * R * T_{std}) / (P_{std} * M_{wH2O})]$	11.2351 ft^3
24)	$B_{ws}(1) = (V_w \text{ std}) / (V_w \text{ std} + V_m \text{ std}) * 100$	23.35 %
25)	$V_{pw} @ t_s = \text{from appendix}$	29.92 in Hg
26)	$B_{ws}(2) = [(V_{pw} @ t_s) / P_s] * 100$	100.31 %
27)	$B_{ws} = \text{lower value of equation 24 or 26}$	23.35 %

VELOCITY:

28)	%O2	14.90 %
29)	%CO2	2.50 %
30)	%N2+Inerts+%CO	82.60 %
31)	$M_d = [0.440 * (\%CO_2)] + [0.320 * (\%CO)] + 0.280 * (\%N_2 + \text{Inerts} + \%CO)$	29.00 g/g-mole
32)	$M_s = M_d * (1 - B_{ws}) + 18.0 * (B_{ws})$	26.43 g/g-mole
33)	ΔP	1.1459 in H2O
34)	C_p	0.844
35)	$v_s = 85.49 * C_p * [(T_s * \Delta P) / (P_s * M_d)]^{1/5}$	71.372 ft/sec
36)	$A_s = 3.14 * [(D_s)^2 / 4]$	12.560 ft^2
37)	$Q_s = (v_s) * A_s * 60$	53786 acfm
38)	$Q_{std} = 17.64 * Q_s * (1 - B_{ws}) * P_s / T_s$	32201 dscfm

EMISSIONS:

FRONT HALF

39)	$m_n \text{ (front)}$	0.02371 g
40)	$C_s \text{ (front)} = 15.43 * m_n \text{ (front)} / V_m \text{ std}$	0.00992 grains/dscf
41)	$7000 \text{ grains} = 1 \text{ lb}, 60 \text{ min} = 1 \text{ hr}, 60 \text{ min/hr} / 7000 \text{ grains/lb} =$	0.00857 lbs-min/grains-hr
42)	$E \text{ (front)} = (0.00857) * (Q_{std}) * C_s \text{ (front)}$	2.74 lbs/hr

BACK HALF

43)	$m_n \text{ (back)}$	0.03629 g
44)	$C_s \text{ (back)} = 15.43 * m_n \text{ (back)} / V_m \text{ std}$	0.01518 grains/dscf
45)	$7000 \text{ grains} = 1 \text{ lb}, 60 \text{ min} = 1 \text{ hr}, 60 \text{ min/hr} / 7000 \text{ grains/lb} =$	0.00857 lbs-min/grains-hr
46)	$E \text{ (back)} = (0.00857) * (Q_{std}) * C_s \text{ (back)}$	4.19 lbs/hr

TOTAL

47)	$m_n \text{ (total)} = m_n \text{ (front)} + m_n \text{ (back)}$	0.06000 g
48)	$C_s \text{ (total)} = 15.43 * m_n \text{ (total)} / V_m \text{ std}$	0.02510 grains/dscf
49)	$7000 \text{ grains} = 1 \text{ lb}, 60 \text{ min} = 1 \text{ hr}, 60 \text{ min/hr} / 7000 \text{ grains/lb} =$	0.00857 lbs-min/grains-hr
50)	$E \text{ (total)} = (0.00857) * (Q_{std}) * C_s \text{ (total)}$	6.93 lbs/hr

ISOKINETICS:

51)	$D_n =$	0.205 in
52)	$A_n = 3.14 * [(D_n)^2 / 4]$	0.0330 in^2
53)	$I = 0.9450 * (T_s * V_m \text{ std}) / (P_s * V_s A_n * (1 - B_{ws}))$	104.61 % = 105 %

??Test Site Name?? on ??Test Date??

P.O. #:???? TEST#: ??????

SAN DIEGO AIR POLLUTION CONTROL DISTRICT, 9150 CHESAPEAKE DRIVE, SAN DIEGO, CA 92123

PARTICULATE TEST LABORATORY ANALYSIS DATA SHEET

TEST SITE: R.E. HAZARD, Q A

TEST #:	P.O.#:	TEST DATE:
LAB ANALYSIS BY: David N. Shina		DATE:
LAB REPORT BY: David N. Shina		DATE:
REVIEWED BY:		DATE:

(1) IMPINGER VOLUMES

FINAL WGT.	INIT WGT.	NET WGT.	Total impinger charge=
#1 744.15 g	574.05 g	= 170.10 g	200.00 ml
#2 618.70 g	573.88 g	= 44.82 g	Partiulates from impinger charge
#3 496.56 g	485.97 g	= 10.59 g	(Total impinger charge * H(water blank) =
#4 644.90 g	631.72 g	= 13.18 g	0.00013 g
#5 g	g	= N/A g	Total weight collected=
#6 g	g	= N/A g	238.69 g
			Total volume collected, Vlc=
			238.69 ml

(2) BLANKS

A	B	C	D	E	F	G	H	I	J	K	L
AREA	SOLVENT	ID	END WGT g	INIT WGT g	NET WGT. g (E-F)	RINSES ml	g/ml (G/D)	% (H*100)	ppm (J*10*6)	PASS FAIL	LIMITS
BLANK	ACETONE	92025	49.4864	49.4837	0.00270	325.00	0.0000083	0.0008308	8.3	P	0.0010%=10ppm
BLANK	WATER	92001	30.8198	30.8198	0.00020	300.00	0.0000007	0.0000667	0.7	P	0.0004%=4ppm
BLANK	ORGANIC	N/A									

(3) WEIGHTS & RINSES

a	b	c	d	e	f	g	h	i	j	k
AREA	SOLVENT	ID	END WGT g	INIT. WGT g	NET WGT. g (e-f)	RINSES ml	SOLV. WGT g (g*H)	WGT (corr) g (i-h)	Subtotal (mn (AREA)) g (Σj)	Total (mn (tot)) g (Σk)
F	ACETONE	92086	29.3092	29.2998	0.0094	300.00	0.002492	0.00691		
R	WATER	92078	28.8605	28.8435	0.0170	300.00	0.000200	0.01680		
O	ORGANIC	N/A								
N	FILTER	N/A								
T								mn(front) =	0.02371 g	
B	ACETONE	92084	29.2592	29.2421	0.0171	330.00	0.002742	0.01436		
R	WATER **	92003	30.2476	30.2254	0.0222	350.00	0.000367	0.02183		
C	ORGANIC	N/A								
K	FILTER	91009	1.0008	1.0007	0.0001			0.00010		
								mn(back) =	0.00020 g	
TOTAL									mn(total) =	0.05000 g

** The Back Water-SOLV.WGT is corrected for the initial impinger charge
{ [g(back water) * H(blank water)] + [Partiulates from impinger charge] }.

METHOD 5 EQUIPMENT CHECKLIST

SITE: 11.8 HAZARD TEST#: 92234 P.O.# 442 DATE: 8/26/92

MISCELLANEOUS

☒ Camera & film
☒ Ice chest
☒ Ice
☒ Tedlar bags
☒ Duct tape

CALCULATION EQUIP.

☒ Source Test briefcase
☒ Calib. notebook
☒ Stopwatch
☒ Nomograph
☒ Calculator
☒ Assorted pens
☒ Tape measure
☒ White out
☒ Labels
☒ Scissors
☒ Teflon tape
☒ L/S Box fuses

LAB/FIELD EQUIPMENT

☒ Acetone
☒ Foil
☒ Parafilm
☒ Distilled water
☒ Kimwipes
☒ Vac. grease
☒ 100 ml grad. cylinder
☒ Sample coll. bottles
☒ Nozzle brush
☒ Probe brush

SAMPLING EQUIPMENT (reserve)

☒ L/S Box
☒ Pitot tube leak test equipment
☒ Umbilical cord
☒ Cold/Hot box
☒ Impingers (Impingers 1-4)
☒ Imp-imp connections
☒ Imp-probe connections
☒ 100ml of water in 1st 2 imp.
☒ Impinger clips
☒ Silica gel imp. with vac. adapter
☒ Filter & Filter holder
☒ Heating coil

SAMPLING EQUIPMENT (main)

☒ L/S Box
☒ Pitot tube leak test equipment
☒ Thermocouple - read-out
☒ Electrical cords (50' & 100')
☒ Umbilical cord
☒ Cold/Hot box
☒ Impingers (Impingers 1-4)
☒ Imp-imp connections
☒ Imp-probe connections
☒ Spare set of connections
☒ 100ml of water in 1st 2 imp.
☒ Impinger clips
☒ Silica gel imp. with vac. adapter
☒ Filter & Filter holder
☒ Spare filter & filter holder
☒ Heating coil
☒ Probe
☒ Spare probe
☒ Nozzle boxes with nuts

TOOL BOX

☒ Assorted monkey wrenches
☒ Assorted open-end wrenches
☒ Assorted screwdrivers
☒ 3' pipe wrench
☒ Port (wire) brush
☒ Tape measure

STACK EQUIPMENT

☒ Unirail
☒ Port/nipple adapters
☒ 2 C-clamps
☒ 2 unirails with rollers
☒ Chains
☒ 2 nylon straps
☒ Rope (25' and 50')
☒ Pail
☒ Gloves (leather)
☒ Gloves (heat resistant)
☒ Rags and diapers

MISCELLANEOUS EQUIPMENT

☒ Nomograph-reserve
☒ Calculator-reserve
☒ Inclometer-reserve (cyclonic flow)
☒ Filter-reserve (high moisture)
☒ Large pipe wrench
☒ Cold/hot box rollers for SDG&E sites

SAFETY

☒ First aid box
☒ Ear plugs
☒ Safety shoes and hat
☒ Safety cones

EQUIPMENT DATA SHEET

	MAIN					RESERVE				
	TYPE	ID#	SIZE	CLEANED	CAL DATE	TYPE	ID#	SIZE	CLEANED	CAL DATE
Nozzle Dia.	NAPP	205	7	OK	6/92					
Pitot Tube	NAPP	5N872	5	OK	2/92					
Tedlar Bag	SLC	—	—	OK	—	SLC	—	—	OK	—
L/S Box	AL375	C138	—	+	6/92					
Stack Sensor	One9	—	K	—	6/92	One94	—	K	—	6/92
Box Sensor	↓	—	K	—	6/92	↓	—	K	—	6/92
Imp. Sensor	↓	—	K	—	6/92	↓	—	K	—	6/92
ΔP Sensor	WATER	—	B-5	—	6/92	WATER	—	—	—	—
ΔH Sensor	WATER	—	O-5	—	6/92	—	—	—	—	—
Cold Box	NAPP	G3	—	—	—	B3	NAPP	—	—	—
Hot Box	NAPP	G3	—	—	—	B3	NAPP	—	—	—
Temp Disp.	One94	—	—	—	—	One94	—	—	—	—

SIGNATURE: OK

DATE: 8/25/92

TIME: 4/40

IMPINGER COLLECTION, GAS ANALYSIS DATA SHEET

SITE: P.O.#: TEST #: DATE:

IMPINGER COLLECTION MEASUREMENTS:

PRE-TEST

A DATE	B IMP No.	C CONTENTS of IMPINGER	D CHARGE AMT (g)	E WGT of IMPINGER +CHARGE (g)
8/25	1	H ₂ O	100	574.05
	2	H ₂ O	100	573.88
	3	—	—	485.97
	4	Silica	—	631.72

POST-TEST

F DATE	G WGT of IMPINGER +CHARGE (g)	H H ₂ O collected (G-E) (g)	I COMMENTS
8/26	744.15	170.10	
	618.70	44.82	
	496.50	10.54	
	644.90	13.18	

TTL WGT OF
CHARGE (ΣD) 200 g

TTL WGT GAIN
FROM IMP (ΣH) 238.64 g

BLANKS:

TYPE	LOT NUMBER	BRAND	PREVIOUS	%PPT	IF YES, TEST SITE
WATER			YES ☒ NO		
ACETONE	9312	omnisolve 3M Sci	YES ☒ NO	1 ppm	
			YES NO		

GAS ANALYSIS:

GAS= CO2	INSTRUMENT: AVALAN AR400	Cal. Gas%= —	% Cal. No.= 23.6
DATE: 8/26	RUN #1= 2.6 %	RUN #2= 2.5 %	RUN #3= 2.5 %
			AVG= 2.5 %

GAS= O2	INSTRUMENT: Teledyne	Cal. Gas%= 7.9	% Cal. No.=
DATE:	RUN #1= 14.96 %	RUN #2= 14.20 %	RUN #3=
			AVG= 14.90 %

FILTERS:

DATE	LOCATION	LABEL	PRE-TEST WEIGHT
—	FRONT	N/A	g
8/26	BACK	91099	1.6009 g

Cp CALCULATION:

ΔP (above)	1.01	Cp(above)	.8452
ΔP (test)	1.15	Cp(test)	?
ΔP (below)	1.45	Cp(below)	.8337

Pitot Tube S/N: 50530
Cal. Date: 6/92
Cp (test)= .8435

$$Cp(test) = \{ ([\Delta P(test) - \Delta P(above)] / [\Delta P(below) - \Delta P(above)]) * [Cp(below) - Cp(above)] \} + Cp(above)$$

$$\left(\frac{1.15 - 1.01}{1.45 - 1.01} \right) * (.8337 - .8452) + .8452$$

$$.1489 * (-.0115) + .8452 = .8435$$

METER ORIFICE CHECK

SITE: L. E. HATFIELD TEST#: 92234 P.O#: 442 DATE: 8/26/92

L/S Box= _____ $\Delta H@$ = _____ Y= _____ Cal. Date= _____

$Y_c = (\text{time}/V_m) * [((0.0319 * T_m)/P_b)^{0.5}]$ run L/S box at $\Delta H@$ for at least 5 minutes

~~PRE-TEST 5 MINUTE Y CHECK~~

POST-TEST ONLY

	TIME	VOLUME	t1 (in)	t2 (out)	t _m =(t1+t2)/2
INITIAL	<u>0</u>	<u>840.269</u>	<u>89</u>	<u>100.5</u>	<u>94.75</u>
	min	ft ³	°F	°F	°F
	<u>8:17.20</u>				
	<u>8:22.20</u>				
FINAL	<u>5</u>	<u>852.195</u>	<u>89</u>	<u>119</u>	<u>104</u>
	min	ft ³	°F	°F	°F

Pbar= 29.68
Y= 1.924
.97*Y= .9623
Y_c= .9875
1.03*Y= 1.022
0.97*Y < Y_c < 1.03*Y
PASS **FAIL**

$(t_{final}) - t_{(initial)}$ $V_{m(final)} - V_{m(initial)}$ $t_m - avg = (t_m(initial) + t_m(final)) / 2$ $T_m = t_m - avg + 460^{\circ}R$

5 min 3.426 ft³ 94.80 °F 559.38 °R

Y_c= 5 min / 3.426 ft³ * $[((0.0319 * 559.38^{\circ}R) / 29.68 \ln Hg)^{0.5}] =$.9875 Y_c

SIGNATURE: [Signature] DATE: 8/26/92 TIME: 9:30

POST-TEST 5 MINUTE Y CHECK

	TIME	VOLUME	t1 (in)	t2 (out)	t _m =(t1+t2)/2
INITIAL					
	min	ft ³	°F	°F	°F
FINAL					
	min	ft ³	°F	°F	°F

Pbar= _____
Y= _____
.97*Y= _____
Y_c= _____
1.03*Y= _____
0.97*Y < Y_c < 1.03*Y
PASS **FAIL**

$(t_{final}) - t_{(initial)}$ $V_{m(final)} - V_{m(initial)}$ $t_m - avg = (t_m(initial) + t_m(final)) / 2$ $T_m = t_m - avg + 460^{\circ}R$

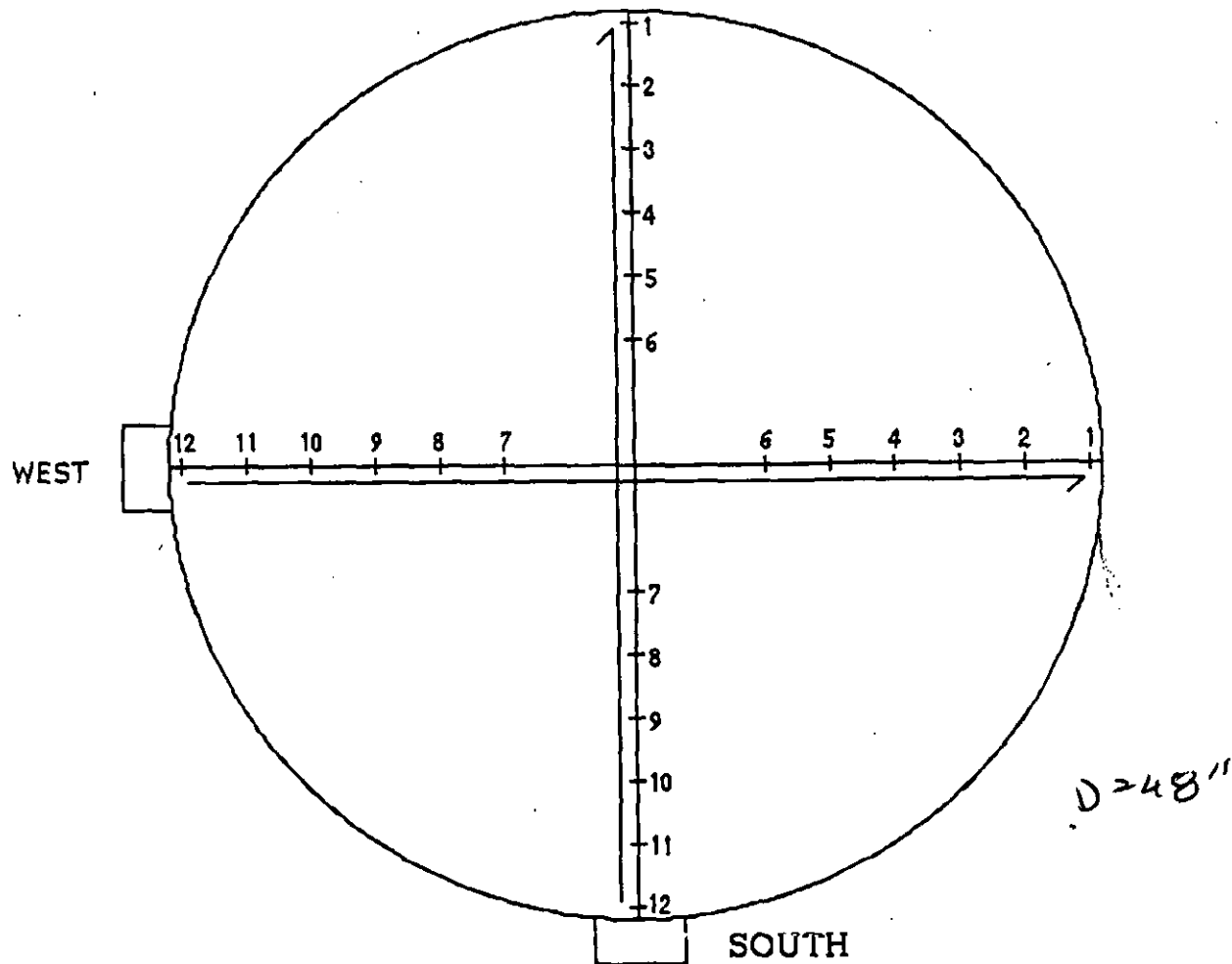
min ft³ °F °R

Y_c= _____ min / _____ ft³ * $[((0.0319 * _____^{\circ}R) / _____ \ln Hg)^{0.5}] =$ _____ Y_c

SIGNATURE: _____ DATE: _____ TIME: _____

SAN DIEGO COUNTY AIR POLLUTION CONTROL STRICT

Figure
TRAVERSE POINTS



POINT	PERC%	DIST.
1	2.1% =	1.0
2	6.7% =	3.2
3	11.8% =	5.7
4	17.7% =	8.5
5	25.0% =	12.0
6	35.6% =	17.1

POINT	PERC%	DIST.
7	64.4% =	30.9
8	75% =	30
9	82.3% =	34.5
10	88.2% =	42.3
11	93.3% =	44.8
12	97.9% =	47