BAY AREA AIR QUALITY MANAGEMENT DISTRICT

July 14, 1992

Vern Freeman, General Manager
Dumbarton Quarry Associates
9600 Quarry Road
Fremont, California 94537

Dear Mr. Freeman:

Enclosed are the results of the source tests that this District conducted on your ***Asphalt Plant*** on ***June 23, 1992.***

These data are considered to be representative of the emissions from this source for the operating parameters described during the test times and are forwarded as a courtesy for your information.

Your cooperation with our Source Test personnel is appreciated. Please contact Gale Karels, Source Test Manager, if you have any questions regarding these data.

Sincerely Yours,

Dario A. Levaggi
Director of Technical Services

DAL:GK:kc

Enclosure

939 ELLIS STREET • SAN FRANCISCO, CALIFORNIA 94109 • (415) 771-6000 • FAX (415) 928-8560

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BAY AREA
AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street
San Francisco, California 94109
(415) 771-6000

SUMMARY OF SOURCE TEST RESULTS

Report No. 92244

Test Date: 06/23/92

Test Times:

Run A: 0729-0820 (50Min)

Run B: 0907-0959 (50Min)

Run C: 1127-1218 (50Min)

SOURCE INFORMATION

Firm Name and Address
DUMBARTON QUARRY ASSOCIATES
9600 Quarry Road
Fremont, CA 94537

Firm Representative and Title
Mr. Vern Freeman,
General Manager
Phone No. (510) 793-8861

Source: S-8 Asphalt Plant
Abated by (A-8) Separator
and (A-9) Baghouse
Plant No. 589
Operates on demand

Permit Conditions
None

BAAQMD REPRESENTATIVES

Source Test Engineers
C. McClure/H. Doi

Permit Services Division / Enforcement Division
J. Lim

Test Requested by:
S. Comiso (CDS) (NSPS)

Operating Parameters:

Asphalt Plant operated continuously at a rate of 300 T.P.H. producing 928 ton of 1/2 inch Aggregate Asphalt during sampling. Rotary Kiln is #2 Diesel fuel fired consuming an average of 423 gallons per hour. The baghouse inlet temperature averaged 250^{0}F with a differential pressure of 5 inches w.c.. Moisture content of the aggregate was 2%.

Applicable Regulations: Regulation 10, subpart I

VN Recommended: NO

Source Test Results and Comments:

METHOD:	TEST	RUN A	RUN B	RUN C	AVERAGE	LIMIT
ST-17	Stack Volume Flowrate, SDCFM				32900	
	Stack Gas Temperature, ^{O}F	204	219	219	214	
ST-23	Water Content, Volume %	16.9	17.9	18.0	17.6	
ST-14	Oxygen, Volume %	14.8	14.7	14.9	14.8	
ST-5	Carbon Dioxide, Volume %	4.9	4.9	4.7	4.8	
ST-6	Carbon Monoxide, ppm	2100	*>3200	2700	>2700	
	Carbon Monoxide, lb/hr	302	>459	383	>381	
ST-15	Particulate, gr/SDCF	.010	.009	.009	.009	.040
	Particulate, lb/hr	2.8	2.5	2.5	2.6	
	Isokinetic Ratio, Act./Theo.	.94	.98	.97		

* A ">" indicates results greater than instrument full scale.
NOTE: P.E.R. 0945-0955 by L. Carey, Ringelmann 0 to 1. See attached report.

Air Quality Engineer II	Date	Supervising Air Quality Engineer	Date	Approved by Source Test Manager	Date
C. McClure II C. McClure	7/13/92	K. Kunaniec K. Kunaniec	7/13/92	G. Karels for G. Karels	7/13/92

STACK FLOWRATE (SDCFM)	32902.4141
STACK FLOWRATE (ACFM)	50854.38
CORRECTED VELOCITY (FPS)	59.8287
DUCT TEMP (deg F)	215.0000
AVG OF HEAD SQR'S	.9521
EQUIV. MOL WT	27.3606

7 FOLL TRAVERSE - AVERAGES

PLT #589
S-8
6/23/92

```
>RUN SPEEDO
SPEEDO
IS THE GAS STREAM PLAIN OLD AIR?
?NO
DO YOU KNOW EQUIVALENT MOLECULAR WEIGHT?
?NO
ENTER %H2O
?16.9
ENTER O2
?14.8
ENTER C02 %
?4.9
ENTER CO PPM
?2113
ANY OTHER SIGNIFICANT COMPONENTS?
?0
AT WHAT TEMP (DEG. F) WAS VELOCITY MEASURED?
?204.1
ENTER BAROMETRIC PRESSURE(IN. HG)
?29.97
ENTER DUCT GAGE PRESSURE(IN. H20)
?-.85
DUCT SHAPE? - C=CIRC, R=RECT, O=OTHER
?R
ENTER LENGTH,WIDTH (INCHES)
?34,60
ENTER PITOT CORRECTION FACTOR
?.810
ENTER HEADS, ONE A TIME ENDING WITH -10
?.80
?.75
?.70
?.77
?.65
?.95
?.85
?.75
?.70
?.55
?-10
```

(A)

```
>run speedo
SPEEDO
IS THE GAS STREAM PLAIN OLD AIR?
?n
DO YOU KNOW EQUIVALENT MOLECULAR WEIGHT?
?no
ENTER %H2O
?17.6
ENTER O2
?14.8
ENTER C02 %
?4.8
ENTER CO PPM
?2670
ANY OTHER SIGNIFICANT COMPONENTS?
?0
AT WHAT TEMP (DEG. F) WAS VELOCITY MEASURED?
?215
ENTER BAROMETRIC PRESSURE(IN. HG)
?29.97
ENTER DUCT GAGE PRESSURE(IN. H20)
?-.85
DUCT SHAPE? - C=CIRC, R=RECT, O=OTHER
?R
ENTER LENGTH,WIDTH (INCHES)
?34,60
ENTER PITOT CORRECTION FACTOR
?.810
ENTER HEADS, ONE A TIME ENDING WITH -10
?.80
?.75
?.70
?.77
?.65
?.95
?.85
?.75
?.70
?.55
?1.1
?.95
?.85
?.75
?.65
?1.25
?1.1
?.90
?.75
?.55
?1.4
?1.2
?1
?1
?1.5
?1.5
?1.20
?1.1
?.60
?-10
```

FULL TRAVERSE DATA

```
STACK FLOWRATE (SDCFM)          30243.7070

STACK FLOWRATE (ACFM)           45602.81

CORRECTED VELOCITY (FPS)        53.6504

DUCT TEMP (deg F)               204.1000

AVG OF HEAD SQR'S                 .8622

EQUIV. MOL WT                   27.4535

>RUN SPEEDO
SPEEDO
IS THE GAS STREAM PLAIN OLD AIR?
?NO
DO YOU KNOW EQUIVALENT MOLECULAR WEIGHT?
?NO
ENTER %H2O
?17.9
ENTER O2
?14.7
ENTER C02 %
?4.9
ENTER CO PPM
?3213
ANY OTHER SIGNIFICANT COMPONENTS?
?0
AT WHAT TEMP (DEG. F) WAS VELOCITY MEASURED?
?219.2
ENTER BAROMETRIC PRESSURE(IN. HG)
?29.97
ENTER DUCT GAGE PRESSURE(IN. H20)
?-.85
DUCT SHAPE? - C=CIRC, R=RECT, O=OTHER
?R
ENTER LENGTH,WIDTH (INCHES)
?34,60
ENTER PITOT CORRECTION FACTOR
?.810
ENTER HEADS, ONE A TIME ENDING WITH -10
?1.1
?.95
?.85
?.75
?.65
?1.25
?1.1
?.90
?.75
?.55
?-10

STACK FLOWRATE (SDCFM)          32078.4375
```

(A)

Vsa

(B)

STACK FLOWRATE (ACFM) 50071.66

CORRECTED VELOCITY (FPS) 58.9078 → V_S B

DUCT TEMP (deg F) 219.2001

AVG OF HEAD SQR'S .9341

EQUIV. MOL WT 27.3364

```
>RUN SPEEDO
SPEEDO
IS THE GAS STREAM PLAIN OLD AIR?
?NO
DO YOU KNOW EQUIVALENT MOLECULAR WEIGHT?
?NO
ENTER %H2O
?18.0
ENTER O2
?14.9
ENTER C02 %
?4.7
ENTER CO PPM
?2683
ANY OTHER SIGNIFICANT COMPONENTS?
?0
AT WHAT TEMP (DEG. F) WAS VELOCITY MEASURED?
?219.0
ENTER BAROMETRIC PRESSURE(IN. HG)
?29.97
ENTER DUCT GAGE PRESSURE(IN. H20)
?-.85
DUCT SHAPE? - C=CIRC, R=RECT, O=OTHER
?R
ENTER LENGTH,WIDTH (INCHES)
?34,60
ENTER PITOT CORRECTION FACTOR
?.810
ENTER HEADS, ONE A TIME ENDING WITH -10
?1.2
?1.2
?1.0
?1.0
?.75
?1.20
?1.2
?1.2
?1.1
?.60
?-10
```

C

STACK FLOWRATE (SDCFM) 34896.8281

STACK FLOWRATE (ACFM)	54521.27
CORRECTED VELOCITY (FPS)	64.1427 V_{sc}
DUCT TEMP (deg F)	219.0000
AVG OF HEAD SQR'S	1.0167
EQUIV. MOL WT	27.3054

>

?44
?-10

ENTER SATURATED GAS TEMPS FOR AVERAGING
?44
?-10

#589
S-8
6/23/92

RUN # 1
V0= ~~23.9107~~
% H20= 16.9~~256~~

> A

RUN # 2
V0= ~~26.2993~~
% H20= 17.9~~241~~

> B

RUN # 3
V0= 28.3577
% H20= 15.2189

>RUN HTWOO
HTWOO
HOW MANY RUNS? 1

RUN # 1
WHAT IS THE WEIGHT ,GM OF CONDENSATE? 122.0

ENTER INITIAL,FINAL METER READING ! 0,28.256

ENTER METER TEMPS FOR AVERAGING
?68.1
?-10

ENTER METER VACUUMS FOR AVERAGING
?15.1
?-10

ENTER SATURATED GAS TEMPS FOR AVERAGING
?44
?-10

% H_2O_{AVG} = 17.6 %

RUN # 1
V0= 28.3577
% H20= 18.0%

> C

>

```
        hello cm.st
ENTER USER (CM) PASSWORD:

HP3000  RELEASE: B.30.00   USER VERSION: B.30.00   FRI, JUN 26, 1992, 12:04 PM
MPE XL  HP31900 B.08.14  Copyright Hewlett-Packard 1987.  All Rights Reserved.
:BASIC

HP32101B.00.25(4WD)  BASIC  (C)HEWLETT-PACKARD CO 1979
>RUN HTWOO
HTWOO
HOW MANY RUNS?  3


RUN #            1
WHAT IS THE WEIGHT ,GM OF CONDENSATE?  98.5

ENTER INITIAL,FINAL METER READING !  0,23.64

ENTER METER TEMPS FOR AVERAGING
?64
?-10

ENTER METER VACUUMS FOR AVERAGING
?7.9
?-10

ENTER SATURATED GAS TEMPS FOR AVERAGING
?42.3
?-10


RUN #            2
WHAT IS THE WEIGHT ,GM OF CONDENSATE?  116.2

ENTER INITIAL,FINAL METER READING !  0,26.076

ENTER METER TEMPS FOR AVERAGING
?65.5
?-10

ENTER METER VACUUMS FOR AVERAGING
?9.0
?-10

ENTER SATURATED GAS TEMPS FOR AVERAGING
?42.8
?-10


RUN #            3
WHAT IS THE WEIGHT ,GM OF CONDENSATE?  122.0

ENTER INITIAL,FINAL METER READING !  0,28.256

ENTER METER TEMPS FOR AVERAGING
?68.1
?-10

ENTER METER VACUUMS FOR AVERAGING
```

ISOKINETIC RATIOS

E.P.A. EQUASION 5-8

$$R_I = \frac{(T_s\ ^\circ R)(V_{o\ SDCF})(K_I)}{(V_s\ FPS)(100-\%H_2O)(A_n\ FT^2)(t\ MINUTES)(P_s\ "Hg)}$$

$K_I = 9.414 \times 10^{-2}$ AT STANDARD CONDITIONS OF 29.92"Hg & 70°F

$$P_s = P_{BAR} + \left(\frac{P_{STATIC}\ "H_2O}{13.6\ "H_2O/"Hg}\right) = 29.97 + \left(\frac{-.85}{13.6}\right)$$

#589
PLANT: DUMBARTON QUARRY
SOURCE: 5-8
DATE: 6/23/92

$P_s = 29.91$ "Hg t = TIME = 50 MINUTES

$A_n = 8.454 \times 10^{-4} (Dn\ cm)^2\ FT^2$ $D_n = 5.3\ mm = .53\ cm$

$A_n = 8.454 \times 10^{-4} (.53\ cm)^2\ FT^2$

$A_n = 2.375 \times 10^{-4}$

GROUP TERMS:

$$R_I = \frac{(T_s)(V_o)(9.414 \times 10^{-2})}{(V_s)(100-\%H_2O)(2.375 \times 10^{-4})(50)(29.91)} = \frac{(T_s)(V_o)(0.2651)}{V_s(100-\%H_2O)}$$

RUN A) $T_s = 664^\circ R$ $V_o = 23.945$ SDCF $V_s = 53.65$ FPS $\%H_2O = 16.9$ $100-\%H_2O = 83.1$

$$R_{I_A} = \frac{(664)(23.945)(0.2651)}{(53.65)(83.1)} = 0.945 = \underline{0.94}$$

RUN B) $T_s = 679^\circ R$ $V_o = 26.362$ SDCF $V_s = 58.91$ FPS $\%H_2O = 17.9$ $100-\%H_2O = 82.1$

$$R_{I_B} = \frac{(679)(26.362)(0.2651)}{(58.91)(82.1)} = 0.981 = \underline{0.98}$$

RUN C) $T_s = 679^\circ R$ $V_o = 28.404$ SDCF $V_s = 64.14$ FPS $\%H_2O = 18.0$ $100-\%H_2O = 82.0$

$$R_{I_C} = \frac{(679)(28.404)(0.2651)}{(64.14)(82.0)} = 0.97 = \underline{0.97}$$

SOURCE TEST LAB DATA SHEET

PLANT: DUMBARTON QUARRY, FREMONT

PAGE: 1 OF 1

SOURCE OPERATION: ASPHALT BAGHOUSE, S-1

INITIAL: KC

SOURCE TEST NO.:

TEST DATE: 6/23/92

FILTER MEDIA: GLASS FIBER, 110 MM

FILTER DATA

RUN #	FILTER #	TARE WEIGHT(g)		FINAL WEIGHT(g)		TOTAL(g)
A	631	.6105	.6106	.6173	.6172	.0066
B	632	.6120	.6122	.6207	.6205	.0083
C	633	.6164	.6165	.6249	.6250	.0084
DATE/TIME		4/7(AM)	4/8(AM)	6/29(AM)	6/30(PM)	

PROBE & NOZZLE RINSE DATA

RUN #	JAR #	TARE WEIGHT(g)		FINAL WEIGHT(g)		TOTAL(g)
A	7	66.4704	66.4705	66.4797	66.4799	.0092
B	8	69.7798	69.7798	69.7874	69.7873	.0075
C	9	70.7854	70.7856	70.7934	70.7934	.0078
DATE/TIME		6/11(AM)	6/12(PM)	6/29(PM)	6/30(PM)	

TOTAL WEIGHTS (FILTER AND PROBE & NOZZLE)

RUN #	FILTER FINAL WT(g)	P & N FINAL WT(g)	TOTAL(g)
A	.0066	.0092	.0158
B	.0083	.0075	.0158
C	.0084	.0078	.0162

SOURCE TEST LAB DATA SHEET

PLANT: DUMBARTON QUARRY

SOURCE OPERATION:

SOURCE TEST NO.:

FILTER MEDIA:

PAGE 1 OF 1

INITIAL KL

TEST DATE 6-23-92

Drying Procedure: 105 °C 24 hours before and after test, desiccated

FILTER DATA

RUN NO.	FILTER NO.	TARE WEIGHT (g)		FINAL WEIGHT (g)		SAMPLE WEIGHT (g)
A	631	.6105	.6106	.6173	.6172	
B	632	.6120	.6122	.6207	.6205	
C	633	.6164	.6165	.6249	.6250	
		4/7 AM	4/8 AM	6/29 PM	6/30 PM	

PROBE & NOZZLE RINSE DATA (total all runs)

RUN NO.	FILTER NO.	JAR SAMPLE FINAL WEIGHT (g)	FILTER SAMPLE FINAL WEIGHT (g)	SAMPLE WEIGHT (g)
A				
B				
C				

PROBE & NOZZLE RINSE DATA (each run)

RUN NO.	PROBE/NOZZLE NOS.	JAR TARE WEIGHT (g)		JAR FINAL WEIGHT (g)		JAR SAMPLE WEIGHT (g)
A	7	66.4704	66.4705	66.4797	66.4799	
B	8	69.7798	69.7798	69.7874	69.7873	
C	9	70.7854*	70.7856*	70.7934	70.7934	
		6/1 AM *6/18 AM	6/12 PM *6/18 PM	6/29 PM	6/30 PM	

IMPINGER DATA

SOLUTION	NO.	A TARE WEIGHT	B FILLED WEIGHT	C FINAL WEIGHT	C-A SAMPLE WEIGHT	C-B CONDENSATE WEIGHT

Form: "Source Test Lab Data Sheet"

PLUME EVALUATION RECORD

VN # _____

B # _____

Firm's Name Dumbarton Quarry Plt # 589 S# 8 Date 6-23-92

Address 9600 Quarry Rd

Source Operation Asphalt plant Contact: Keith Belt Plant Engineer

Emission Point stack off Asphalt plant Type: ( ) A (X) B

Observation Position and Distance ~100-130' from stack, sun at back

Time Start 0945 M Time Stop ~~0944~~ 0955 M

Min	0	15	30	45	Min	0	15	30	45
0945	1/2	1/2	1/2	1/2					
0946	1/2	1/2	3/4	3/4					
0947	1/2	3/4	3/4	1/2					
0948	1/2	1/2	0	0					
0949	3/4	1/2	1/2	3/4					
0950	1	3/4	1/2	0					
0951	1/2	3/4	1	3/4					
0952	3/4	1/2	3/4	1/2					
0953	3/4	1	3/4	1					
0954	3/4	3/4	3/4	3/4					
0955	1	3/4	1	3/4					
0956	/	/	/	/					

Plume Color and Background Used Blue sky / some clouds

Approx. stack height from ground level ~ 25' feet

Weather sunny hot - partly cloudy

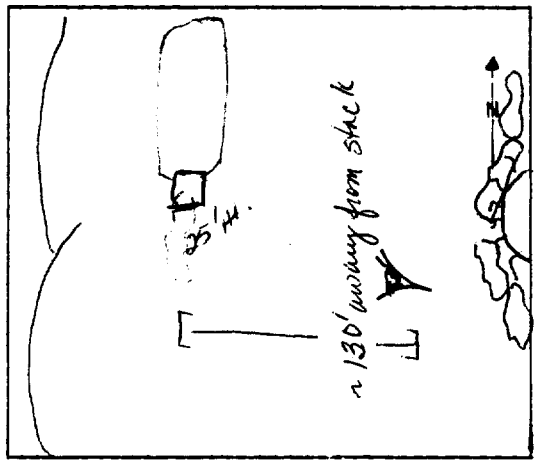
Plume *Wet (X) Dry ( )

*Relative Humidity _____ Hrs

Wet Bulb 64° R.H. 80 %

Dry Bulb 68°

Wind From N MPH ~ 2mph



Notes: Rt read plume as long as possible but cloud cover moved in the way and Rt couldn't find good back ground to read any longer.

Wet Plume Recording

Example

In stack 5 / 1½ Residual

Photos Roll ____ #s

Picture ____ #s

R2 thru 3 ____ Min

R4 thru 5 ____ Min

Total 1-1/2 thru 5 ____ Min

Excessive plume

First observed at ____ M

Last observed at ____ M

Linda J. Carey
observer

Insp # 468

Form: Plume Evaluation Record--August 25, 1987

See Reverse ( )

SOURCE TEST LAB DATA SHEET

IMPINGER DATA

PLANT: DUMBARTON QUARRY, FREMONT

PAGE: 1 OF 1

SOURCE OPERATION: ASPHALT BAGHOUSE

INITIAL: KC/HD

SOURCE TEST NO.:

TEST DATE: 6/23/92

IMPINGER SOLUTION: DI H2O

DATA

IMPINGER#	A TARE WEIGHT(g)	B FILLED WEIGHT(g)	C FINAL WEIGHT(g)
P-1	477.2	578.2	674.8
P-2	494.6	594.6	596.5
P-3	494.4	594.4	708.7
P-4	495.3	595.3	597.2
P-5	481.9	581.9	702.8
P-6	480.8	580.8	581.9

IMPINGER#	C-A SAMPLE WEIGHT(g)	C-B CONDENSATE WT(g)	TOTAL WEIGHT(g)
P-1	197.6	96.6	RUN A
P-2	101.9	1.9	98.5
P-3	214.3	114.3	RUN B
P-4	101.9	1.9	116.2
P-5	220.9	120.9	RUN C
P-6	101.1	1.1	122.0

ISOKINETIC RATIOS

E.P.A. EQUASION 5-8

$$R_I = \frac{(T_s\ ^\circ R)(V_{o\ SDCF})(K_I)}{(V_s\ FPS)(100-\%H_2O)(A_n\ ft^2)(t\ MINUTES)(P_s\ "Hg)}$$

$K_I = 9.414 \times 10^{-2}$ AT STANDARD CONDITIONS OF 29.92" Hg & 70°F

#589
PLANT: DUMBARTON QUARRY
SOURCE: S-8
DATE: 6/23/92

$$P_s = P_{BAR} + \left(\frac{P_{STATIC}\ "H_2O}{13.6\ "H_2O/"Hg}\right) = 29.97 + \left(\frac{-.85}{13.6}\right)$$

$P_s = 29.907$ t = TIME = 50 MINUTES

$A_n = 8.454 \times 10^{-4} (Dn\ cm)^2\ FT^2$ $D_n = 5.3\ mm = .53\ cm$

$A_n = 8.454 \times 10^{-4} (.53\ cm)^2 FT^2$

$A_n = 2.375 \times 10^{-4}$

GROUP TERMS:

$$R_I = \frac{(T_s)(V_o)(9.414 \times 10^{-2})}{(V_s)(100-\%H_2O)(2.375 \times 10^{-4})(50)(29.907)} = \frac{(T_s)(V_o)(.2651)}{V_s(100-\%H_2O)}$$

RUN A) $T_s = 664^\circ R$ $V_o = 23.945$ SDCF $V_s = 53.65$ FPS $\%H_2O = 16.9\%$ $100-\%H_2O = 83.1$

$$R_{I_A} = \frac{(664)(23.945)(.2651)}{(53.65)(83.1)} = 0.9454 = \underline{0.94}$$

RUN B) $T_s = 679^\circ R$ $V_o = 26.362$ SDCF $V_s = 58.91$ FPS $\%H_2O = 17.9$ $100-\%H_2O = 82.1$

$$R_{I_B} = \frac{(679)(26.362)(.2651)}{(58.91)(82.1)} = 0.981 = \underline{0.98}$$

RUN C) $T_s = 679^\circ R$ $V_o = 28.404$ SDCF $V_s = 64.14$ FPS $\%H_2O = 18.0$ $100-\%H_2O = 82.0$

$$R_{I_C} = \frac{(679)(28.404)(.2651)}{(64.14)(82.0)} = 0.972 = \underline{0.97}$$

GRAIN LOADING

$$G_{gr/SDCF} = 15.43 \cdot \frac{W_P\,(g)}{V_D\,(SDCF)}$$

DUMBARTON QUARRY #589
5-8 6/23/92

$G_A = 15.43\dfrac{(0.0158)}{(23.945)} = 0.010\,gr/SDCF$

$G_B = 15.43\dfrac{(0.0158)}{(26.36)} = 0.009\,gr/SDCF$

$G_C = 15.43\dfrac{(0.0162)}{(28.404)} = 0.009\,gr/SDCF$

$G_{AVG} = 0.009\,gr/SDCF$

$W_{PA} = .0158\,g$

$W_{PB} = .0158\,g$

$W_{PC} = .0162\,g$

$V_{DA} = 23.945\,SDCF$

$V_{DB} = 26.36\,SDCF$

$V_{DC} = 28.404\,SDCF$

MASS EMISSIONS $\quad M = \dfrac{G \cdot Q}{116.67}\ Lb/HR$

$Q_D = 32902\,SDCFM$

$M_A = \dfrac{(0.010)(32902)}{116.67} = 2.8\,Lb/HR$

$M_B = (0.009)(282.01) = 2.5\,Lb/HR$

$M_C = (0.009)(282.01) = 2.5\,Lb/HR$

$M_{AVG} = 2.6\,Lb/HR.$

DUMBARTON QUARRY #589
S-8 6/23/92

$CO_{PPM} \xrightarrow{TO} CO_{Lb/HR}$

$$CO_{Lb/HR} = \frac{(CO_{PPM})(\overline{MW}_{CO})(60)(Q_o)}{386.9 \times 10^6}$$

$$CO_{Lb/HR} = \frac{(CO_{PPM})(28.01)(60)(32902)}{386.9 \times 10^6} = (CO_{PPM})(0.1429)$$

$CO_{A\,PPM} = 2113\,PPM$

$CO_{B\,PPM} = >3213\,PPM$

$CO_{C\,PPM} = 2683\,PPM$

$CO_{A\,Lb/HR} = (2113)(0.1429) = 302\,Lb/HR$

$CO_{B\,Lb/HR} = (>3213)(0.1429) = >459\,Lb/HR$

$CO_{C\,Lb/HR} = (2683)(0.1429) = 383\,Lb/HR$

$CO_{AVG\,Lb/HR} = >381\,Lb/HR$

GAS ANALYSIS

GAS	SPAN VALUE	SPAN UNITS
O_2	20.95% (AIR)	7.57u
CO_2	14.8%	6.54u
CO	1210PPM	2.76u

SPAN CYLINDER #LL10543

DUMBARTON QUARRY #589
S-8 6/23/92

RUN A)

O_2	CO_2	CO
5.34	2.21	4.75
5.35	2.19	4.75
5.30	2.22	5.35
5.34	2.21	4.20
5.40	2.13	5.05
$\bar{X}$= 5.35u	$\bar{X}$=2.19u	$\bar{X}$= 4.82u

$\frac{20.95\%}{7.57u} \propto \frac{X\%O_2}{5.35u}$

$\frac{14.8\%}{6.54u} \propto \frac{X\%CO_2}{2.19u}$

$\frac{1210PPM}{2.76u} \propto \frac{XPPMCO}{4.82u}$

RUN A
O_2 = 14.8%
CO_2 = 4.9%
CO = 2113PPM

RUN B)

O_2	CO_2	CO
5.58	2.00	3.60
5.27	2.10	7.33
5.25	2.23	6.18
5.33	2.22	5.10
5.08	2.30	7.34
$\bar{X}$=5.30u	$\bar{X}$=2.17u	$\bar{X}$=5.90u
		$\bar{X}$ > 7.33u

$\frac{20.95\%}{7.57u} \propto \frac{X\%O_2}{5.30u}$

$\frac{14.8\%}{6.54u} \propto \frac{X\%CO_2}{2.17u}$

$\frac{1210PPM}{2.76u} \propto \frac{X\%CO_2}{5.90u}$
> 7.33u

RUN B
O_2 = 14.7%
CO_2 = 4.9%
CO => 3213PPM

RUN C)

O_2	CO_2	CO
		6.00
5.33	2.07	6.00
5.41	2.10	6.05
5.38	2.12	6.40
5.36	2.12	6.15
$\bar{X}$=5.37u	$\bar{X}$=2.10u	$\bar{X}$=6.12u

$\frac{20.95\%}{7.57u} \propto \frac{X\%O_2}{5.37u}$

$\frac{14.8\%}{6.54u} \propto \frac{X\%CO_2}{2.10u}$

$\frac{1210PPM}{2.76u} \propto \frac{X\%PPM}{6.12u}$

RUN C
O_2 = 14.9%
CO_2 = 4.7%
CO = 2683PPM

O_{2AVG} = 14.8%
CO_{2AVG} = 4.8%
CO_{AVG} => 2670PPM

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Source Test Data Sheet

Run No. A
Date: 6/23/92

P-60

Source Operation DOMESTIC ASPHALT
Plant #589
Sample Type PARTICULATES, COMBUSTION
Process Cycle BAGHOUSE STACK
Duct Size 34X60" RECT
Duct Pressure −.85" H_2O → MEASURED
ASSUMED H_2O 20%

5.3mm
5.4mm Nozzle Diameter
.810 Pitot Tube
VAN#12 Gas Collector No.
29.97 Barometric Pressure
0.005 at 22 Leak Rate
5 TIME EACH POINT
10 # OF POINTS
50 TIME EACH RUN

MAG GAGE RACK#V12-111 METER(Y)=.98214

Sampling Train: PROBE ⇒ FILTER # 631 ⇒ IMP# P-1 IMP# P-2 ⇒ PUMP# VAN#12 ⇒ METER# 570950 ⇒ EXH.

Traverse Point	Dist. From PORT inches	INITIAL TRAVERSE Duct Temp °F	INITIAL TRAVERSE ΔP H_2O	Traverse Point	ΔP H_2O	V_s FPS	Time (0729) 0	METER Rate CFH	METER Temp °F	METER Volume Ft³ 921.81	Vac "Hg	Sat'd Gas Temp °F	T_s Duct Temp °F	REMARKS
1				A-1	.80	53.4	5	31.1	64	24.40 924.43	9	39	150	
2				A-2	.75	53.1	10	29.3	64	26.87 926.90	9	42	184	
3				A-3	.70	51.8	15	28.1	64	29.24 929.24	7	43	196	
4				A-4	.77	54.6	20	29.3	64	31.68 931.70	8	43	203	
5		SWITCH PORTS →		A-5	.65	50.4	25	26.8	64	33.93 933.93	6.5	46	209	
				B-1	.95	61.1	30	32.3	64	36.62 936.64	10	38	213	
				B-2	.85	58.1	35	30.4	64	39.17 939.10	9	44	≥20	
				B-3	.75	54.6	40	28.5	64	41.48 941.50	8.5	44	221	
				B-4	.70	52.8	45	27.5	64	43.89 943.84	7	42	222	
				B-5	.55	46.7	(0820) 50	24.4	64	45.87 945.88	5	42	223	
									64	24.07	(7.9)	(42.3)	(204.1)	
									524	X.98214			664	
										23.64				

$$D_n = 13.7\left[\frac{T_s + 460}{V_s(100 - \%H_2O)}\right]^{1/2}$$ OLD Tech 5.4mm

Condensate 101 (g) 199 102
V_o 23.94 SCF 301 −200 101
$\%H_2O$ 16.7% 101

$$Q_m = \left[(2.638 \times 10^{-3})\ \frac{(100 - \%H_2O)\,D_{nun}^2}{(80)\ (5.3)^2}\right]\frac{V_s}{T_s}$$ 2.985 .810

$$V_s = (K)(C_p)\sqrt{\frac{T_s \cdot \Delta P''}{P_s M_w}} = \frac{85.49}{\sqrt{(P_b \pm \frac{P_s}{13.6})\,M_w}} = 2.985$$

$$V_o = \frac{17.71\,(T_m)(P_b)}{T_m\ ^{OR}} = 23.945$$ 524

$$\left[(29.97 - \tfrac{.5}{13.6})(27.40)\right]^{1/2} = 29.933$$

34 × 60 — 54, 42, 30, 18, 12, 6 — 60

A B C D

6	18	30	42	54

B-SITUATION

Source Test Team
CHUCK McCLURE
Source Test Engineer II
11.00Z

OPEN MGR.

#2 DIESEL 310TPH PROD

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Source Test Data Sheet

7.05 GPM
423 GPHOOR

Source Operation	S-8	5.3mm	Nozzle Diameter
Plant	#589	.810	Pitot Tube
Sample Type	PART & COMB.	VAN#12	Gas Collector No.
Process Cycle	B/H STACK	29.97	Barometric Pressure
Duct Size	RET 34X60 2" PORTS	0.004@20	Leak Rate
Duct Pressure	-.85" H_2O	5	TIME EACH POINT
ASSUMED H_2O	18%	10	# OF POINTS
		50	TIME EACH RUN

TIME 0 METER 15011 GAL
TIME 32MIN 3SEC 15237 GAL > 226 GAL / 32.05 MIN =
32.05 MIN

Source Test No. ______
Run No. B
Date: 6/23/92

MAG GAGE RACK# V12-111. METER(Y) = .98214

Sampling Train: PROBE ⇒ FILTER # 632 ⇒ IMP# P-3 IMP# P-4 ⇒ PUMP# VAN#12 ⇒ METER# 510960 ⇒ EXH.

Traverse Point	Dist. From inches	INITIAL TRAVERSE Duct Temp °F	INITIAL TRAVERSE ΔP H_2O	SAMPLING Traverse Point	ΔP " H_2O	V_s FPS	Time (0907)	METER Rate CFH	METER Temp °F	Volume Ft^3	Vac "Hg	Sat'd Gas Temp °F	T_s Duct Temp °F	REMARKS
							0			946.38			188	
				B-1 1.1	~~.60~~	64.5	5	36.3	66	49.41 949.43	15	36	175	
				B-2	.95	60.8	10	33.3	66	52.21 952.25	9	40	205	
				B-3	.85	57.8	15	31.3	66	54.86 954.85	7	44	213	
				B-4	.75	54.6	20	29.3	65	57.29 957.30	6.5	44	220	
				B-5	.65	51.0	25	27.2	65	59.56 959.56	6	44	224	
				C-1	1.25	70.8	30	37.6	65	62.69 962.72	15.5	40	226	
				C-2	1.1	66.6	35	35.2	65	65.65 965.68	~~9.5~~ /	45	229	
				C-3	.90	60.1	40	31.9	65	68.34 968.35	8	46	226	
				C-4	.75	55.0	45	29.0	66	70.77 970.84	7	44	231	
				C-5	.55	47.1	50	24.9	66	72.91 972.93	8.5	45	230	
							0959		65.5	26.55	9.0	42.8	219.2	
									525	X.98214			679	

26.676

B-SITUATION

$$D_n = 13.7 \left[\frac{T_s + 460}{V_s(100 - \%H_2O)} \right]^{1/2}$$

$$Q_m = \left[(2.638 \times 10^{-3}) \quad (100 - \%H_2O) D_{nun}^2 \right] \frac{V_s}{T_s}$$

$(5.3)^2$ 82

Condensate 118 (g)
V_o 26.362 SCF
$\%H_2O$ 17.5%

216
102
318
-200
118

$$V_s = (K)(C_P)\sqrt{T_s \cdot \Delta P''} \qquad K = \frac{85.49}{\sqrt{(P_b \pm \frac{P_s}{13.6}) MW}}$$

$$V_o = \frac{17.71 (V_m)(P_b)}{T_m} = 26.362 \text{ SDCF}$$

26.676 29.97
OR 525

Source Test Team
CHUCK McCLURE
Source Test Engineer II
H. DOI

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Source Test Data Sheet

Source Operation	S-8		5.3mm	Nozzle Diameter
Plant	#5PG		.810	Pitot Tube
Sample Type	PART & COMB	Source Test No. ______	VAN#12	Gas Collector No.
Process Cycle	3/4 STEEL	Run No. C	29.97	Barometric Pressure
Duct Size	34X60 RECT w/2" PORTS	Date: 6/23/92	0.003 @ 21	Leak Rate
Duct Pressure	-.85" H₂O		5	TIME EACH POINT
ASSUMED H₂O	18%		10	# OF POINTS
			50	TIME EACH RUN

MAG GAGE RACK # V12-111 METER(Y) = .98214

Sampling Train: PROBE ⇒ FILTER # 633 ⇒ IMP # P-5 IMP # P-6 ⇒ PUMP # VAN#12 ⇒ METER # 510950 ⇒ EXH.

Traverse Point	Dist. From inches	INITIAL TRAVERSE Duct Temp °F	INITIAL TRAVERSE ΔP H₂O		SAMPLING Traverse Point	ΔP " H₂O	V_s FPS	Time (1127)	METER Rate CFH	METER Temp °F	METER Volume Ft³	Vac "Hg	Sat'd Gas Temp °F	T_s Duct Temp °F	REMARKS
C-1 1.4	D-1 1.5						65.1	0	39.2		973.20				
C-2 1.2	D-2 1.5				C-1	1.2	67.8	5	40.9	67	976.47	17	36	145	
C-3 1.0	D-3 1.20 / 1.10				C-2	1.2	68.3	10	37.4	67	979.59	17	38	205	
C-4 1.0	D-4 D-5				C-3	1.0	62.8	15	33.9	67	982.43	16.5	44	215	
					C-4	1.0	64.0	20	33.3	68	985.21	14	46	241	
					C-5	.75	54.8	25	29.2	68	987.66	10	45	225	
					D-1	1.26	69.4	30	36.8	68	990.78	18	45	227	
					D-2	1.20	69.6	35	36.7	69	993.90	18	47	231	
					D-3	1.20	69.7	40	36.7	69	996.99	18	46	233	
					D-4	1.10	66.8	45	35.1	69	999.80	15	46	234	
					D-5	.60	49.3	50 (1218)	25.9	69	1001.97	8	47	234	
										68.1	28.77	15.1	44	219	
										528	X.98214			679	

28.256 ft³

USE SMALLER NOZZLE ON HARD 150's ON SOME POINTS — LONG SAMPLE LINE — MAY FLOWS ≥ 3 CFH at 1.2" H₂O — SWITCH PORTS

$$D_n = 13.7\left[\frac{T_s + 460}{V_s(100-\%H_2O)}\right]^{1/2}$$

Condensate (9)

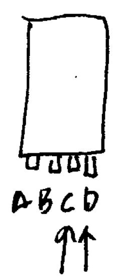
V_o ______ SCF

$\%H_2O$ ______

$$Q_m = \left[(2.638 \times 10^{-3})\ (100-\%H_2O)D_{nun}^2\right]\frac{V_s}{T_s}$$

$V_s = (K)(C_P)\sqrt{T_s \cdot \Delta P''}$ $K = \frac{85.49}{\sqrt{(P_b \pm \frac{P_s}{13.6})\ MW}}$

$V_o = \frac{17.71 (V_m)(P_b)}{T_m\ ^\circ R} = 28.404$ SDCF (28.256, 29.97, 528)



Source Test Team
CHUCK McCLURE
Source Test Engineer II
H. POI