

AP42 Section: 11.1

Reference Number: 217

Title: Summary Of Source Test Results At Granite Rock Co., San Jose, CA,

Bay Area Air Quality Management District, San Francisco, CA,

September 13, 1992.

DISTRIBUTION:

Firm
Permit Services
Enforcement
Technical Services
Planning
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DAPCO

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

Report No. 931

Test Date: 09/

Test Times:

Run A: 0757-0847

Run B: 0909-0959

Run C: 1014-1104

**SUMMARY OF
SOURCE TEST RESULTS**

SOURCE INFORMATION		BAAQMD REPRESENTATIVES
Firm Name and Address GRANITE ROCK COMPANY 110 Granite Rock Way San Jose, CA 95136	Firm Representative and Title Mr. Doug Tolbert, Plant Manager Phone No. (408) 281-8082	Source Test Engineers C. McClure/H. Doi
Permit Conditions None	Source: S-1 Asphalt Plant Plant No. 651 Operates on demand	Permit Services Division / Enforcement Division J. Lim Test Requested by: G. Solomon (NSPS) (CDS)

Operating Parameters:
Plant operated continually at 350 T.P.H. producing 1575 ton of 3/4" Aggregate Asphalt during sampling. Rotary Kiln is Natural Gas fired consuming an average of 509 C.F.M.. Baghouse differential pressure was 3.8 inches w.c..

Applicable Regulations:	Regulation 10, Subpart I	VN Recommended:	YES
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Source Test Results and Comments:

METHOD:	TEST	RUN A	RUN B	RUN C	AVERAGE	LIMIT
ST-17	Stack Volume Flowrate, SDCFM				29,800	
	Stack Gas Temperature, °F	272	272	273	272	
ST-23	Water Content, Volume %	30.2	30.9	32.8	31.3	
ST-14	Oxygen, Volume %	12.2	12.3	11.4	12.0	
ST-5	Carbon Dioxide, Volume %	5.0	5.1	5.3	5.1	
ST-6	Carbon Monoxide, ppm				> 3300	
	Carbon Monoxide, lb/hr				> 425	
ST-15	Particulate, gr/SDCF	.641	.569	.575	.595	.04
	Particulate, lb/hr	164	145	147	152	
	Isokinetic Ratio, Act./Theo.	1.08	.97	.99		

A ">" indicates results greater than instrument limit of detection.

NOTE: P.E.R. 0910-0917 by E. Brown, Ringelmann 1 to 3 1/4. See attached report.

NO COMMERCIAL USE OF THESE RESULTS IS AUTHORIZED

Air Quality Engineer II C. McClure II C. McClure	Date 9/11/92	Supervising Air Quality Engineer K. Kunaniec K. Kunaniec	Date 9/14/92	Approved by Source Test Manager G. Karels	Date 9/15/92
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SOURCE TEST LAB DATA SHEET

PLANT: GRANITE ROCK, SAN JOSE

PAGE: 1 OF 1

SOURCE OPERATION: ASPHALT BAGHOUSE

INITIAL: KC

SOURCE TEST NO.:

TEST DATE: 09/04/92

FILTER MEDIA: GLASS FIBER, 110 MM

FILTER DATA

RUN #	FILTER #	TARE WEIGHT(g)		FINAL WEIGHT(g)		TOTAL(g)
A	652	.6108	.6109	1.1016	1.0913	.4804
B	653	.6148	.6150	1.0864	1.0866	.4714
C	654*	.6062	.6063	1.0742	1.0740	.4677
DATE/TIME		6/2 AM	6/2 PM	9/10 AM	9/10 PM	

* 7/13 AM, 7/14 AM

PROBE & NOZZLE RINSE DATA

RUN #	JAR #	TARE WEIGHT(g)		FINAL WEIGHT(g)		TOTAL(g)
A	1	66.1466	66.1470	66.5255	66.5257	.3785
B	2	64.5988	64.5987	65.0287	65.0287	.4299
C	3	70.7028	70.7029	71.1315	71.1313	.4284
DATE/TIME		7/28 PM	7/29 PM	9/10 AM	9/10 PM	

TOTAL WEIGHTS (FILTER AND PROBE & NOZZLE)

RUN #	FILTER FINAL WT(g)	P & N FINAL WT(g)	TOTAL(g)
A	.4804	.3785	.8589
B	.4714	.4299	.9013
C	.4677	.4284	.8961

GRAIN LOADING $G_{gr/socf} = 15.43 \frac{(W_p) g}{(V_o) socf}$

$$G_A = 15.43 \frac{(0.8589) g}{20.678 socf} = 0.641 g/socf$$

$$G_B = 15.43 \frac{(0.9013) g}{(24.459) socf} = 0.569 g/socf$$

$$G_C = 15.43 \frac{(0.8961) g}{(24.034) socf} = 0.575 g/socf$$

$$G_{avg} = \underline{0.595 g/socf}$$

MASS EMISSIONS (Lb/hr)

$$M_{lb/hr} = \frac{G \cdot Q_o (socf)}{116.67}$$

$$Q_o = 29,834 socfm$$

$$M_A = \frac{(0.641)(29834)}{116.67} = 164 Lb/hr$$

$$M_B = \frac{(0.569)(29834)}{116.67} = 145 Lb/hr$$

$$M_C = \frac{(0.575)(29834)}{116.67} = 147 Lb/hr$$

$$M_{avg} = \underline{152 Lb/hr}$$

GRANITE ROCK CO S/J
PLT# 657 S-1
9/4/92

$$W_{p_A} = 0.8589$$

$$W_{p_B} = 0.9013$$

$$W_{p_C} = 0.8961$$

$$V_{o_A} = 20.678 socf$$

$$V_{o_B} = 24.459 socf$$

$$V_{o_C} = 24.034 socf$$

SOURCE TEST LAB DATA SHEET

IMPINGER DATA

PLANT: GRANITE ROCK, SAN JOSE

PAGE: 1 OF 1

SOURCE OPERATION: ASPHALT BAGHOUSE

INITIAL: KC

SOURCE TEST NO.:

TEST DATE: 9/4/92

IMPINGER SOLUTION: DI H2O

DATA

IMPINGER#	A TARE WEIGHT(g)	B FILLED WEIGHT(g)	C FINAL WEIGHT(g)
S-1	515.8	615.3	763.8
S-2	509.2	609.3	647.1
S-3	485.0	584.9	734.8
S-4	492.6	592.2	669.5
S-5	481.2	581.3	821.3
S-6	499.7	599.5	603.9

IMPINGER#	C-A SAMPLE WEIGHT(g)	C-B CONDENSATE WT(g)	TOTAL WEIGHT(g)
P-1	248.0	148.5	RUN A
P-2	137.9	37.8	186.3
P-3	249.8	149.9	RUN B
P-4	176.9	77.3	227.2
P-5	340.1	240.0	RUN C
P-6	104.2	4.4	244.4

ISOKINETIC RATIOS

E.P.A. EQUATION

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

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

$$P_s = P_{BAR} + \left(\frac{P_{STATIC} \text{ "H}_2\text{O}}{13.6 \text{ "H}_2\text{O/"Hg}} \right) = 30.09 + \left(\frac{-.65}{13.6} \right)$$

$$P_s = 30.042 \text{ "Hg} \quad t = \text{TIME} = 50 \text{ MINUTES}$$

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

$$D_{nA} = 3.8 \text{ mm} = .38 \text{ cm}$$

$$A_n = 8.454 \times 10^{-4} (.38 \text{ cm})^2 \text{ FT}^2$$

$$D_{nB\&c} = 4.4 \text{ mm} = .44 \text{ cm}$$

$$A_{nA} = 1.221 \times 10^{-4} \text{ FT}^2$$

$$A_{nB\&c} = 8.454 \times 10^{-4} (.44 \text{ cm})^2 \text{ FT}^2$$

GROUP TERMS:

$$A_{nB\&c} = 1.637 \times 10^{-4} \text{ FT}^2$$

$$R_I = \frac{(T_s)(V_o)(9.414 \times 10^{-2})}{(V_s)(100 - \%H_2O)(A_n)(30.042)(50)} = \frac{(T_s)(V_o)(6.267 \times 10^{-5})}{V_s(100 - \%H_2O)(A_n)}$$

$$\text{RUN A)} T_s = 731^\circ R \quad V_o = 20.678 \text{ SDCF} \quad V_s = 102.81 \quad \%H_2O = 30.2 \quad 100 - \%H_2O = 69.8 \quad A_{nA} = 1.221 \times 10^{-4} \text{ FT}^2$$

$$R_{IA} = \frac{(731)(20.678)(6.267 \times 10^{-5})}{(102.81)(69.8)(1.221 \times 10^{-4})} = 1.081 = \underline{\underline{1.08}}$$

$$\text{RUN B)} T_s = 732^\circ R \quad V_o = 24.459 \text{ SDCF} \quad V_s = 102.33 \quad \%H_2O = 30.9 \quad 100 - \%H_2O = 69.1 \quad A_{nB\&c} = 1.637 \times 10^{-4} \text{ FT}^2$$

$$R_{IB} = \frac{(732)(24.459)(6.267 \times 10^{-5})}{(102.33)(69.1)(1.637 \times 10^{-4})} = 0.969 = \underline{\underline{0.97}}$$

$$\text{RUN C)} T_s = 732^\circ R \quad V_o = 24.034 \text{ SDCF} \quad V_s = 100.85 \quad \%H_2O = 32.8 \quad 100 - \%H_2O = 67.2 \quad A_{nB\&c} = 1.637 \times 10^{-4} \text{ FT}^2$$

$$R_{IC} = \frac{(732)(24.034)(6.267 \times 10^{-5})}{(100.85)(67.2)(1.637 \times 10^{-4})} = 0.993 = \underline{\underline{0.99}}$$

#651
PLANT: GRANITE ROCKED
SOURCE: S-1 RESPIRATOR
DATE: 9/4/92

GAS ANALYSIS

GAS SPAN SPAN
VALUE UNITS

O₂ 20.95% 7.63u

CO₂ 15.2% 6.95u

CO 1200PPM 2.75u → FULLSCALE OF 7.52u (AT 200MM) SCALE

SPAN CYLINDER #17-1597

GRANITE ROCK CO S/S
#657 S-1 9/4/92

RUN A) O₂ CO₂ CO
4.45 2.34 7.52 ⇒ 7328/PPM
4.47 2.21 $\frac{20.95\%}{7.63} \times \frac{X_{O_2}\%}{4.46}$
4.45 2.35 $\frac{15.2\%}{6.95} \times \frac{X_{CO_2}\%}{2.3u}$
4.46u 2.3u 2.75u

RUN A

O₂ = 12.2%

CO₂ = 5.0%

CO > 328/PPM

RUN B) O₂ CO₂ CO
4.54 2.27 7.52 ⇒ 7328/PPM
4.55 2.28 $\frac{20.95\%}{7.63u} \times \frac{X_{O_2}\%}{4.48u}$
4.45 2.38 $\frac{15.2\%}{6.95u} \times \frac{X_{CO_2}\%}{2.33u}$
4.40 2.39
4.48u 2.33u

RUN B

O₂ = 12.3%

CO₂ = 5.1%

CO > 328/PPM

RUN C) O₂ CO₂ CO
4.18 2.47 7.52
4.14 2.44 $\frac{1200}{7.52} \times \frac{X}{2.75} = 7328/PPM$
4.15 2.44 $\frac{20.95\%}{7.63u} \times \frac{X_{O_2}\%}{4.15u}$
4.13 2.43 $\frac{15.2\%}{6.95u} \times \frac{X_{CO_2}\%}{2.44u}$
4.15u 2.44u

RUN C

O₂ = 11.4%

CO₂ = 5.3%

CO > 328/PPM

O₂ AVG = 12.0%
CO₂ AVG = 5.1%
CO > 328/PPM



BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street, San Francisco, Calif. 94109 • 771-6000
3/5 Source Test Data Sheet

A. 4. 1/2 in.	Nozzle Diameter
147.826	Pitot Tube
147.812	Gas Collector No.
30.09	Barometric Pressure
0.023 at 20	Leak Rate
5	TIME EACH RUN
10	# OF POINTS
50	TIME EACH RUN

Source Operation S-1 31.45m
Plant
Sample Type GRAVIMETRIC VB 62/73
Process Cycle PACIFIC WEST COMBUSTION DB
Duct Size B.H. STACK
R-424

Source Test No. _____
Run No. _____
Date: 9/4/92

150000
7/27/92
RH 55%

Source Test No. _____
Run No. _____
Date: _____

MAG GAGE RACK #V/2-11 METER(Y) = 99456

Sampling Train: PROBE $\Rightarrow$ FILTER # 653 $\Rightarrow$ IMPH S-3 IMPH S-4 $\Rightarrow$ PUMP# 522 $\Rightarrow$ METER# 1027581 $\Rightarrow$ EXH.

Traverse Point	Dist. From inches	INITIAL TRAVERSE		SAMPLING										REMARKS	
		Duct Temp ^o F	ΔP H ₂ O	Traverse Point	ΔP H ₂ O	V _L FPS	Time	Rate CFH	METER		Volume Ft. ³	Vac "Hg	Sat'd Gas Temp ^o F		T _g Duct Temp ^o F
									Temp ^o F	Temp ^o F					
A-1				3.9	129.1	0	39.6	69	52.94	18	31	240			
2				3.5	125.3	10	36.6	69	52.9	18	41	274			
3				2.5	106.1	15	30.9	69	53.4	15.5	41	277			
4				1.85	91.2	20	26.6	69	53.7	11	40	276			
5				1.35	77.9	25	22.7	69	53.9	8.5	40	276			
6				1.15	71.8	30	21.0	69	54.5	8	40	274			
7				1.70	87.2	35	25.5	69	54.8	9.5	41	272			
8				1.40	79.4	40	23.1	70	54.8	9	41	277			
9				2.4	103.9	45	30.2	70	54.7	14	41	277			
10				3.5	125.5	50	36.5	70	55.0	18	42	277			
						55.0		19.3	24.47	12.9	(39.8)	(272)			
								(5.2)	24.33			(732)			

AP-2.0
AP-2.80

←  B-SITUATION
Source Test Team
CHUCK MCCLURE
Source Test Engineer II
H.M.C.D.

ate 228 (9)
002115750F
11120 3026

$$D_n = 13.7 \left[\frac{740}{\frac{T_B - T_{\infty}}{N_2 (100 - 111.2)} } \right]^{1/2} = 4.56 \text{ mm} \quad \text{Conc}$$

$V_s = (K)(C_p) \left[\frac{T \cdot \Delta P}{P_b \pm \frac{P_s}{2}} \right] MW$
 $V_s = 17.71 (C_p) (P_b) \cdot 24.459$
 $T = 52.9$

$$\begin{array}{r} 250 \\ 178 \\ \hline 428 \\ 250 \\ \hline 228 \end{array}$$



BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street, San Francisco, Calif. 94109 • 771-6000

Source Test Data Sheet

Source Operation S-1
Plant GRANITE ROCK #51
Sample Type ANALYZED CONDENSATE
Process Cycle ANALYZED SPARK
Duct Size 12-12 1/2"
Duct Pressure 7.65
ASSUMED H₂O
3896
Source Test No. C
Run No. 9/4/92
Date: 9/4/92
4.4 in. Nozzle Diameter
P44 8226 Pitot Tube
VAN#12 Gas Collector No.
3209 Barometric Pressure
0.003330 Leak Rate
5 TIME EACH RUN
10 # OF POINTS
50 TIME EACH RUN

MAG GAGE RACK# V12-11 METER(Y) = 99456

Sampling Train: PROBE → FILTER # 654 → IMPH # 5-5 IMPH # 56 → PUMP # 522 → METER # 1023501 → EXH.

Traverse Point	Dist. From inches	INITIAL TRAVERSE		SAMPLING										REMARKS
		Duct Temp of	ΔP H ₂ O	Traverse Point	ΔP H ₂ O	V _g PPS	(1014) Time	Rate CFH	METER Temp of	Volume Ft ³	Vac "Hg	Sat'd Gas Temp of	T _g Duct Temp of	
				A-1	3.6	1231	5	38.3	71	53.8	18	35	229	
				2	2.9	1143	10	33.2	71	56.7	12	41	278	
				3	2.4	1010	15	30.2	71	59.9	9	41	278	
				4	1.85	913	20	26.5	71	63.3	8.5	41	278	
				5	1.35	779	25	22.7	71	66.7	9	41	276	
				6	.95	654	30	19.0	72	69.9	7	41	278	
				7	1.25	750	35	21.8	72	73.3	8	40	276	
				8	2.1	972	40	28.3	72	76.7	10	41	276	
				9	2.6	1083	45	31.4	72	79.9	14	41	279	
				10	3.3	1210	50	35.4	72	83.3	18	41	279	
									71.5	24.08	11.3	40.3	272.7	
									(531)	28.949	11.3	40.3	272.7	

B-SITUATION
Source Test Team
CHUCK McCURE
Source Test Engineer II
H. DOE

Condensate V₀ (g) M ←
H₂O

Condensate V₀ (g) M ←
H₂O

$$D_h = 13.7 \left[\frac{T_g + 460}{V_g (100 - H_2O)} \right]^{1/2}$$
$$Q_m = \left[(2.638 \times 10^{-3}) (100 - H_2O) D_h^2 \right] \frac{V_g}{T_g}$$
$$V_g = (K)(C_p) \left[\frac{T_g \cdot \Delta P}{V_m (C_p + 1)} \right]^{1/2}$$
$$V_0 = \frac{17.71 (V_m) (C_p + 1)}{T_g} = 24,034 \text{ SCF}$$

$$V_g = (K)(C_p) \left[\frac{T_g \cdot \Delta P}{V_m (C_p + 1)} \right]^{1/2}$$
$$V_0 = \frac{17.71 (V_m) (C_p + 1)}{T_g} = 24,034 \text{ SCF}$$

PLANT: # 651.

DATE: 9/4/92

ADDRESS: GRANITE ROCK WY

OPERATOR:

DOBBS/

DEAN'S

MITCHELL

OPERATOR

PLANT #: GRANITE ROCK

- 1) What are you producing: 1/4", 1/2" 3/4"
- 2) What rate are you producing at: 350 Tons/Hour - Average
- 3) What is your maximum rate of production: Tons/Hour
- 4) How much will you produce today: 1575 Tons-Average
- 5) What type of fuel are you burning: ✓
- 6) What is your rate of fuel useage: ✓
- 7) What is your baghouse inlet temperature averaging:
- 8) What is your baghouse differential pressure: 3.8 "H₂O
- 9) What is the moisture content of the aggregate: % H₂O
- 10) Are there any abnormal conditions in the plant today: NO

Thank You

PLANT#
651

Granite Rock Company
110 Granite Rock Wy
San Jose, CA 95136

Sources:

- 1 HOT MIX PLANT
- 2 AGGREGATE STOCKPILE
- 3 ENCLOSED HOT MIX STORAGE BIN & ELEVATOR
- 4 ENCLOSED HOT MIX STORAGE BIN & ELEVATOR
- 5 HOT MIX STORAGE BIN
- 6 ASPHALT TANK
- 7 ASPHALT TANK
- 8 EMULSIFIED ASPHALT TANK
- 9 CONVEYORS
- 10 Recycle Crusher Plant
- 11 Recycle Screen
- 12 Recycle Conveyor System Stockpile
- 13 Unitized Concrete Batcher
- 14 Cement Silo

Abatement Devices:

- 1 BAG HOUSE
- 10 Recycle Crusher Water Spray
- 11 Recycle Screen's Water Spray
- 12 Water Spray System
- 13 Fabric Filter - Batcher
- 14 Fabric Filter - Loadout
- 15 Stacker Water Spray (for unloading)
- 16 Water Spray (Concrete Loadout)
- 17 Fabric Filter - Silo

Emission Points:

- 1 train: ,A1,,
- 2 train: ,A17,,

**BAY AREA
AIR QUALITY MANAGEMENT DISTRICT**

Interoffice Memorandum

September 15, 1992

TO: Tony Gambardella, Enforcement Division
VIA: Dario Levaggi, Director of Technical Services
FROM: Gale Karels, Source Test Manager *GK*
SUBJECT: Recommendation for Violation Notice; c/o

GRANITE ROCK COMPANY - SAN JOSE (PLANT # 651)

Reference:

Source Test Number(s): 93033

The referenced document shows:

EXCESS PARTICULATE EMISSIONS

It is therefore recommended that a Violation Notice be issued pursuant to

Regulation 10, Subpart I

on

September 4, 1992.

- [X] Please send Source Test Letter
[] Please **DO NOT** send Source Test Letter

GK:kc