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.

TEST RESULTS FOR FUME SUPPRESSANT CERTIFICATION

OMI INTERNATIONAL CORPORATION'S FOAM-LOK L IN HARD CHROME PLATING TANKS

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TABLE OF CONTENTS

Executive Summary.....1
Introduction..... 2
Equipment and Process Description..... 4
Testing Methodology..... 7
Results of Source Tests..... 10
Quality Assurance/Quality Control.....27
Process Data Sheets..... Appendix
Field Data Sheets..... Appendix
Sample Recovery Sheets..... Appendix
Calculation Sheets ..... Appendix
Lab Results..... Appendix
Chain of Custody Sheets..... Appendix
Calibration Sheets..... Appendix

EXECUTIVE SUMMARY

SCAQMD Rule 1169, adopted June 3, 1988 and amended September 8, 1989, requires all hard chrome plating operations in the District to demonstrate emission reductions of 95% or stack emission rates below 0.15 mg/amp-hour as of November 1, 1989. Further reductions are required in 1990 and 1992 for facilities with substantial emissions. The Metal Finishing Association of Southern California (MFASC) has offered to provide data on the efficiency of fume suppressants for preventing emissions of chromic acid mists.

SCAQMD has indicated that data from such tests would be accepted if the tests are conducted in accordance with SCAQMD requirements. The extent of the emission reduction in terms of a percentage of uncontrolled tank emissions must be clearly demonstrated for each anti-mist additive by multiple tests on full scale plating tanks. Once the additive is certified by the SCAQMD, the emission reductions will be acknowledged if the additive is used in accordance with the manufacturer's directions.

This report provides source test data and results on the efficiency of OMI International Corporation's anti-mist additive, Foam-Lok L, in controlling chromic acid emissions from hard chrome plating tanks. After 6 days of testing a hard chrome plating tank under uncontrolled and controlled conditions, it was found that the average efficiency of Foam Lok L with polyballs in controlling chromic acid emissions was 98.5% for total chrome and 98.6% for hexavalent chrome.

INTRODUCTION

Pacific Environmental Services (PES), a participant in CARB's Independent Contractor Program, was contracted by OMI International Corporation to perform source testing to determine the efficiency of OMI's Foam Lok L in reducing chromic acid emissions from hard chrome plating tanks. Two tests per day were conducted for a three day period on uncontrolled emissions from a hard chrome plating tank, and two tests per day were conducted for a three day period on the emissions from the same plating tank with 1" Polyballs and Foam-Lok L added to the plating solution. Test dates were October 31-November 2, 1989 for the uncontrolled tests and November 6-8, 1989 for the tests with polyballs and Foam-Lok L.

In order to evaluate the effectiveness of the anti-mist additive Foam-Lok L, it was necessary to have a host hard chrome plating tank outfitted with an emission collection system. Facilities were made available by Size Control Plating Company in La Puente, CA. Mr. Clarence Todden, President, provided assistance with tank operation during source testing. The sampling location for the tests was in the 14" I.D. tank exhaust duct for Tank #1, before the emissions passed through any air pollution control equipment. The sample location and tank diagram are shown in Figure 1.

Source tests were conducted by M.J. Simon and S.G. Parks of PES, under the direction of M.D. High, Vice President of PES. Sam Oguntulu of SCAQMD was present during all days of testing to observe test conditions. Vijay Merchant of OMI International was present during the first day of testing and during the days of controlled tank testing to make the additions of Foam-Lok L to the plating solution.

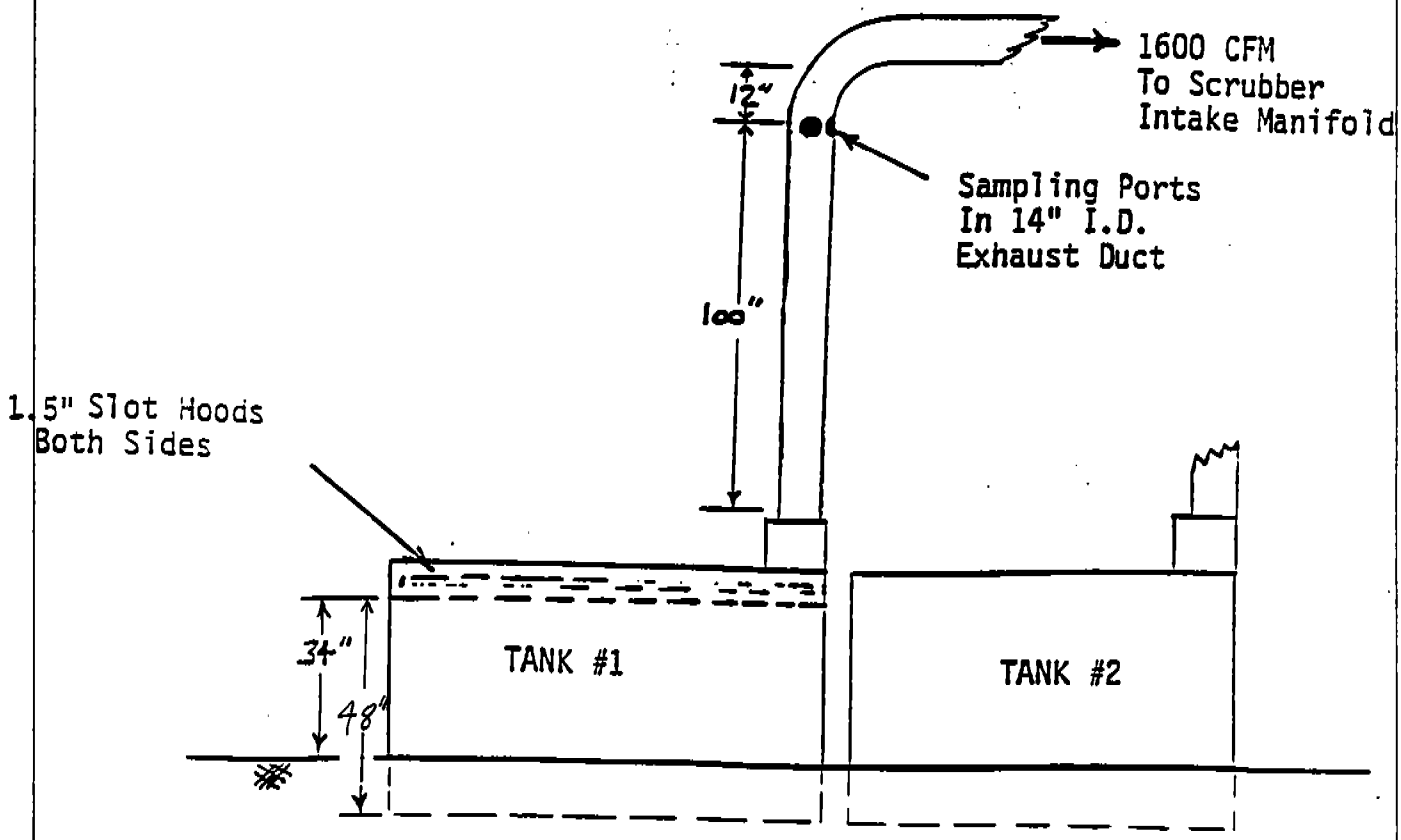


FIGURE 1

Tank #1 Sampling Location
Size Control Plating Co.
La Puente, CA.

EQUIPMENT AND PROCESS DESCRIPTION

Size Control Plating Company, 13349 Temple Avenue La Puente, CA 91746, is engaged in the business of hard chrome plating. Tests of chromic acid emissions were performed on hard chrome plating Tank #1. The dimensions of Tank #1 were 59"L x 31"W x 48"D.

Before the tests were initiated, a smoke tube was used to check the collection efficiency of the Tank #1 emission collection system. No fugitive emissions were observed at any time.

Two tests each were conducted using applied amperages of approximately 800, 1600, and 2400 for both uncontrolled and controlled conditions (a total of twelve tests). Voltage was 5.0 - 6.75 volts D.C.. It was supplied by rectifier 17 for the low and medium load conditions and rectifiers 16 and 17 for the high load condition. In order to obtain repeatable current consumptions, 1, 2, or 3 identical dummy loads were plated. These dummy loads consisted of 2.75" I.D., 24" long steel cylinders. The cylinders were sized so that about 2 amps/square inch was applied to conduct plating on the inside of the cylinders. Each cylinder used 400 amps for plating so the tank was loaded with 2,4, or 6 cylinders for the low, medium, or high load condition. The cylinders were placed (vertically) in the exact same positions for the uncontrolled and controlled tests. This plating generated a flow of solution through the cylinder and up to the tank surface. The SCAQMD agreed that 100% coverage of the plating surface was most difficult to obtain under these conditions.

Air agitation was not used during any tests. The plating bath chromic acid concentration was approximately 33 oz./gallon. Tank temperature was maintained at 130-134 degrees Fahrenheit. Three heat exchangers in the tank were used as necessary to ensure that the temperature for each test did not change by more than 3 degrees Fahrenheit. Freeboard height was maintained at about 6" for all tests. The tank was not used for any plating (except for test purposes) during the test days. A summary of process conditions is shown in Table 1.

TABLE 1: SUMMARY OF PROCESS CONDITIONS

TEST NUMBER	OMI FOAM-LOK L	POLYBALLS	APPLIED AMPERAGE	APPLIED VOLTAGE	STACK FLOW-RATE (DSCFM)
HOMI-1	NO	NO	853	5.0	1731
HOMI-2	NO	NO	833	5.0	1631
HOMI-3	NO	NO	1584	5.75	1724
HOMI-4	NO	NO	1645	6.0	1703
HOMI-5	NO	NO	2568	5.6	1664
HOMI-6	NO	NO	2504	5.5	1695
HOMI-7	YES	YES	853	5.0	1676
HOMI-8	YES	YES	855	5.0	1680
HOMI-9	YES	YES	1654	6.25	1695
HOMI-10	YES	YES	1755	6.25	1720
HOMI-11	YES	YES	2560	5.7	1663
HOMI-12	YES	YES	2405	5.5	1620

TEMPERATURE: 130° -134° F
FREEBOARD HEIGHT: 6" ± 1"

For the controlled emission tests, the fume suppressant manufacturer provided the fume suppressant. The manufacturer's representative, Vijay Merchant, installed suppressant in quantities sufficient to maintain 100% coverage of the plating solution surface. A record of chemical additions and manufacturer's test observations is included in the Appendix as part of the test data.

Additions to the tank prior to the six controlled tests are summarized below:

Test No. 7	129 cc	initial charge
Test No. 8	86 cc	
Test No. 9	86 cc	
Test No. 10	86 cc	
Test No. 11	86 cc	
Test No. 12	129 cc	

Foam-Lok L is a powerful surface active additive used to produce a foam blanket on hard chrome plating tanks. It is used to successfully reduce the chromic acid mist and spray regardless of operating temperature or current density. Foam Lok L may be used without affecting the catalyst relationship and without concern for gross pitting of metal parts.

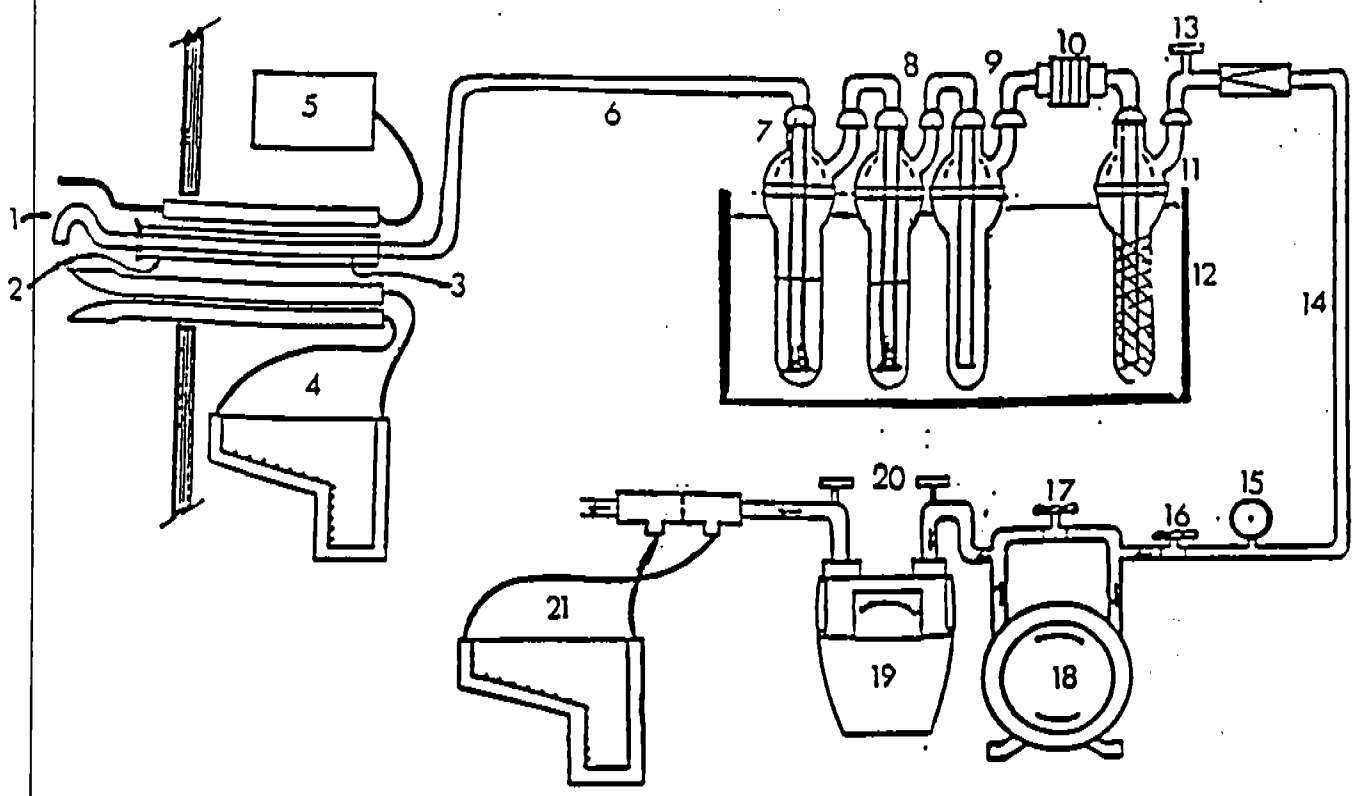
TESTING METHODOLOGY

PES used the proposed test method of CARB Method 425, dated July 7th, 1989, for sampling the chrome emissions. Sampling locations, velocities, volumetric flow rate, and moisture content determinations were done in accordance with CARB Methods 1, 2, and 4. As specified by CARB Method 1, 20 sampling points were used.

The sample was extracted through a glass nozzle, a nonheated 20" glass-lined stainless steel probe, a 10 foot teflon hose from the probe to the first impinger, two Greenburg-Smith impingers each with 100 ml of 0.1N sodium hydroxide solution, an empty impinger, a glass filter holder, an impinger filled with silica gel, a 25 foot umbilical line, a vacuum pump, a dry gas meter, and a calibrated orifice connected to an inclined manometer (Figure 3). Teflon coated glass fiber filters with 0.3, 0.1, and 0.035 micron pore layers were used in the filter holders.

The length of each test was 60 minutes. Sample sizes ranged from 45 to 47 cubic feet depending on the nozzle size used and the measured stack gas velocities. Field data were recorded on field data sheets (Appendix) during each test. Leak checks were performed before and after each test.

The volume of the impinger solution and the weight of the silica gel was recorded before and after the tests in order to obtain the moisture content of the stack gas stream. The contents of the impingers were placed in 500 ml. polyethylene containers and the sampling train from the impingers to the nozzle was rinsed 3 times with a 0.1 N sodium hydroxide solution and added to the same containers. Filters were placed in other polyethylene bottles and analyzed separately. The samples were kept at 60 degrees Fahrenheit or less during and after the tests prior to the analyses in order to prevent deterioration of hexavalent chrome to total chrome.



1. Glass sampling nozzle
2. Stainless steel probe sheath
3. Glass lined probe
4. Type S pitot tube and manometer for ΔP readings
5. Stack temperature sensor
6. 10 ft. teflon probe line with ball and socket connectors
7. Greenburg-Smith impinger with 100 ml. of .1 N NaOH solution
8. Greenburg-Smith impinger with 100 ml. of .1 N NaOH solution
9. Modified Greenburg-Smith impinger - dry
10. Filter holder with teflon coated glass fiber filter
11. Modified Greenburg-Smith impinger filled with 200 grams of silica gel
12. Impinger case filled with ice
13. Impinger exit gas temperature sensor
14. Umbilical line to meter box
15. Vacuum gauge
16. Coarse adjustment valve
17. By-pass valve to adjust ΔH
18. Leak free vacuum pump
19. Dry gas meter
20. Dry gas meter inlet and outlet temperature sensors
21. Orifice meter with manometer for ΔH readings

FIGURE 2
Diagram Of Sampling Train

Laboratory analyses were conducted by Thermo Analytical Laboratory in Monrovia, California. Analyses for total chrome used atomic absorption spectrophotometry and analyses for hexavalent chrome used diphenylcarbazide colorometric techniques. The detection level of the analytical procedure for hexavalent chrome, Cr 6, and total chrome, Cr T, were 0.003 and 0.001 mg/l respectively. Total chrome is easier to measure and detection levels can be reduced to lower levels than those possible for hexavalent chrome. Total chrome analyses serve as a back-up and quality control check for hexavalent chrome concentrations.

RESULTS OF SOURCE TESTS

Calculations were made from the field data sheets to determine sample volume, moisture content, molecular weight, velocities, flow rates of the exhaust gas stream. The isokinetic variations for all tests were between 97 and 102%. Results are shown on the emission test calculation sheets (Appendix).

LOW LOAD

Test HOMI-1, conducted on the uncontrolled tank with an average amperage of 853 showed an emissions rate of 4.14 mg/amp-hour for total chrome and 3.85 mg/amp-hour for hexavalent chrome. Test HOMI-2, conducted on the uncontrolled tank with an average amperage of 833 showed an emissions rate of 11.23 mg/amp-hour for total chrome and 10.16 mg/amp-hour for hexavalent chrome. The average emission rate for the two uncontrolled tests HMT-1 and HMT-2, with a nominal applied amperage of 800, was 7.68 mg/amp-hour for total chrome and 7.01 mg/amp-hour for hexavalent chrome (Table 1A and 1B).

Test HOMI-7, conducted with a 100% coverage of the plating solution surface by polyballs and Foam-Lok L and an average amperage of 853, showed an emissions rate of 0.16 mg/amp-hour for total chrome and 0.14 mg/amp-hour for hexavalent chrome. Test HOMI-8, conducted on the tank, with a 100% coverage of polyballs and Foam-Lok L and an average amperage of 855, showed an emissions rate of 0.05 mg/amp-hour for total chrome and 0.04 mg/amp-hour for hexavalent chrome. The average emission rate for the two controlled tests, HOMI-7 and HOMI-8, with a nominal applied amperage of 800, was 0.11 mg/amp-hour for total chrome and 0.09 mg/amp-hour for hexavalent chrome (Table 4A and 4B).

From these results the reduction benefit of polyballs and Foam-Lok L, for plating conditions with nominal amperages of 800 was calculated. Results showed a reduction of 98.6% for total chrome and 98.7% for hexavalent chrome (Table 7).

MEDIUM LOAD

Test HOMI-3, conducted on the uncontrolled tank with an average amperage of 1584 showed an emissions rate of 7.75 amp-hour for total chrome and 6.48 mg/amp-hour for hexavalent chrome. Test HOMI-4, conducted on the uncontrolled tank with an average amperage of 1645 showed an emissions rate of 11.13 mg/amp-hour for total chrome and 10.95 mg/amp-hour for hexavalent chrome. The average emission rate for the two uncontrolled tests HOMI-3 and HOMI-4, with a nominal applied amperage of 1600, was 9.44 mg/amp-hour for total chrome and 8.71 mg/amp-hour for hexavalent chrome (Tables 2A and 2B).

Test HOMI-9, conducted with a 100% coverage of polyballs and Foam-Lok L on the plating surface and an average amperage of 1654, showed an emissions rate of 0.17 mg/amp-hour for total chrome and 0.11 mg/amp-hour for hexavalent chrome. Test HOMI-10, conducted with a 100% coverage of polyballs and Foam-Lok L and an average amperage of 1755, showed an emissions rate of 0.08 mg/amp-hour for total chrome and 0.09 mg/amp-hour for hexavalent chrome. The average emission rate for the two controlled tests, HOMI-9 and HOMI-10, with a nominal applied amperage of 1600, was 0.12 mg/amp-hour for total chrome and 0.10 mg/amp-hour for hexavalent chrome (Tables 5A and 5B).

From these results the reduction benefit of polyballs and Foam-Lok L, for plating conditions with nominal amperages of 1600 was calculated. Results showed a reduction of 98.7% for total chrome and 98.6% for hexavalent chrome (Table 7).

HIGH LOAD

Test HOMI-5, conducted on the uncontrolled tank with an average amperage of 2568, showed an emissions rate of 2.28 mg/amp-hour for total chrome and 2.03 mg/amp-hour for hexavalent chrome. Test HOMI-6, conducted on the uncontrolled tank with an average amperage of 2504 showed an emissions rate of 8.34 mg/amp-hour for total chrome and 9.06 mg/amp-hour for hexavalent chrome. The average emission rate for the two uncontrolled tests HOMI-5 and HOMI-6, with a nominal applied amperage of 1600, was 5.31 mg/amp-hour for total chrome and 5.55 mg/amp-hour for hexavalent chrome (Tables 3A and 3B).

Test HOMI-11, conducted with a 100% coverage of polyballs and Foam-Lok L and an average amperage of 2560, showed an emissions rate of 0.10 mg/amp-hour for total chrome and 0.11 mg/amp-hour for hexavalent chrome. Test HOMI-12, conducted with a 100% coverage of polyballs and Foam-Lok L and an average amperage of 2405, showed an emissions rate of 0.10 mg/amp-hour for total chrome and 0.10 mg/amp-hour for hexavalent chrome. The average emission rate for the two controlled tests, HOMI-11 and HOMI-12, with a nominal applied amperage of 2400, was 0.10 mg/amp-hour for total chrome and 0.10 mg/amp-hour for hexavalent chrome (Tables 6A and 6B).

From these results the reduction benefit of polyballs and Foam-Lok L, for plating conditions with nominal amperages of 2400 was calculated. Results showed a reduction of 98.1% for total chrome and 98.2% for hexavalent chrome (Table 7).

GENERAL OBSERVATIONS

Comparison of paired tests taken under nearly identical operating conditions on the same day showed that emission rates of the chromic acid mist vary considerably (1-63%, with an average variance of 42.5%) for uncontrolled tanks. By contrast, emission rates were more consistent from the plating tanks after control (1-58%, with an average variance of 26.4%) which, in this case, was the use of polyballs and Foam-Lok L. Longer sampling periods would probably have smoothed out some of the variations.

Hexavalent chrome measurements as a percent of the total chrome measured in the collected samples were fairly consistent on all 12 tests ranging from 63 to 100 percent with an average of 90 percent (Table 8). Samples where laboratory results showed higher amounts of hexavalent chrome than total chrome were reported as 100% hexavalent chrome. There was no significant difference between the ratios of hexavalent chrome to total chrome on the controlled versus uncontrolled tanks.

The chromic acid mist reduction benefit of the polyballs and Foam-Lok L as measured by hexavalent chrome was very consistent at all three loads - low, medium and high - showing 98.7, 98.9, and 98.2 percent reductions respectively. The average was 98.6 percent. The reduction benefit as measured by total chrome showed an average of 98.5 percent.

TABLE 1A: TOTAL CHROME EMISSIONS FROM AN UNCONTROLLED HARD CHROME PLATING TANK AT LOW LOAD

TEST DATE: 10/31/89
POLYBALLS: None
ADDITIVE: None
AMPERAGE: Nominal, 800 A

HOMI-1-L Sample liquid from the impingers in the sample train for test HOMI-1.
HOMI-1-F Sample caught on the filter in the sample train for test HOMI-1.
HOMI-2-L Sample liquid from the impingers in the sample train for test HOMI-2.
HOMI-2-F Sample caught on the filter in the sample train for test HOMI-2.

SAMPLE RUN NUMBER	SAMPLE VOLUME (ml)	Conc. Cr T (mg/l)	Impinger Catch Cr T (mg)	Filter Catch Cr T (mg)	Total Catch Cr T (mg)	SAMPLE METER VOL (dscf)	EMISSIONS Cr T (mg/dscf)	STACK FLOW RATE (dscfm)	ACTUAL EMISSIONS Cr T (mg/hour)	AVERAGE AMPERAGE (amps)	EMISSIONS Cr T (mg/amp-hour)
HOMI-1-L	715	2.17	1.552								
HOMI-1-F				0.0165							
TEST TOTAL					1.5680	46.162	0.0340	1731	3528.0	853	4.136
HOMI-2-L	700	6.21	4.347								
HOMI-2-F				0.0099							
TEST TOTAL					4.3569	45.595	0.0956	1631	9351.2	833	11.226
AVERAGE							0.0648	1681	6439.6	843	7.681

TABLE 18: HEXAVALENT CHROME EMISSIONS FROM AN UNCONTROLLED HARD CHROME PLATING TANK AT LOW LOAD

TEST DATE: 10/31/89
PULLYBALLS: None
ADDITIVE: None
AMPERAGE: Nominally 800 A

HOMI-1-L Sample liquid from the impingers in the sample train for test HOMI-1.
HOMI-1-F Sample caught on the filter in the sample train for test HOMI-1.
HOMI-2-L Sample liquid from the impingers in the sample train for test HOMI-2.
HOMI-2-F Sample caught on the filter in the sample train for test HOMI-2.

SAMPLE RUN NUMBER	SAMPLE VOLUME (ml)	Conc. Cr 6 (mg/l)	Impinger Catch Cr 6 (mg)	Filter Catch Cr 6 (mg)	Total Catch Cr 6 (mg)	SAMPLE METER VOL (dscf)	EMISSIONS Cr 6 (mg/dscf)	STACK FLOW RATE (dscfm)	ACTUAL EMISSIONS Cr 6 (mg/hour)	AVERAGE AMPERAGE (amps)	EMISSIONS Cr 6 (mg/amp-hour)
HOMI-1-L	715	2.03	1.451								
HOMI-1-F				0.0098							
TEST TOTAL					1.4612	46.162	0.0317	1731	3287.7	853	3.854
HOMI-2-L	700	5.63	3.941								
HOMI-2-F				0.0032							
TEST TOTAL					3.9442	45.595	0.0865	1631	8465.4	833	10.163
AVERAGE							0.0591	1681	5876.5	843	7.008

TABLE 3A: TOTAL CHROME EMISSIONS FROM AN UNCONTROLLED HARD CHROME PLATING TANK AT MEDIUM LOAD

TEST DATE: 11/1/89
POLYBALLS: None
ADDITIVE: None
AMPERAGE: Nominally Tank 4

HOMI-3L Sample liquid from the impingers in the sample train for test HOMI-3.
HOMI-3F Sample caught on the filter in the sample train for test HOMI-3.
HOMI-4L Sample liquid from the impingers in the sample train for test HOMI-4.
HOMI-4F Sample caught on the filter in the sample train for test HOMI-4.

SAMPLE RUN NUMBER	SAMPLE VOLUME (ml)	Conc. Cr T (mg/l)	Impinger Catch Cr T (mg)	Filter Catch Cr T (mg)	Total Catch Cr T (mg)	SAMPLE METER VOL (dscf)	EMISSIONS Cr T (mg/dscf)	STACK FLOW RATE (dscfm)	ACTUAL EMISSIONS Cr T (mg/hour)	AVERAGE AMPERAGE (amps)	EMISSIONS Cr T (mg/amp-hour)
HOMI-3L	670	8.23	5.514								
HOMI-3L				0.0262							
TEST TOTAL					5.5403	46.707	0.1186	1724	12269.9	1584	7.746
HOMI-4L	850	9.66	8.211								
HOMI-4L				0.0135							
TEST TOTAL					8.2245	45.896	0.1792	1703	18310.5	1645	11.131
AVERAGE							0.1489	1714	15290.2	1615	9.439

TABLE 29: HEXAVALENT CHROME EMISSIONS FROM AN UNCONTROLLED HARD CHROME PLATING TANK AT MEDIUM LOAD

TEST DATE: 11/1/89
POLI/BALLS: None
ADDITIVE: None
AMPERAGE: Nominally 1600 A

HOMI-3L Sample liquid from the impingers in the sample train for test HOMI-3.
HOMI-3F Sample caught on the filter in the sample train for test HOMI-3.
HOMI-4L Sample liquid from the impingers in the sample train for test HOMI-4.
HOMI-4F Sample caught on the filter in the sample train for test HOMI-4.

SAMPLE RUN NUMBER	SAMPLE VOLUME (ml)	Conc. Cr 6 (mg/l)	Impinger Catch Cr 6 (mg)	Filter Catch Cr 6 (mg)	Total Catch Cr 6 (mg)	SAMPLE METER VOL (dscf)	EMISSIONS Cr 6 (mg/dscf)	STACK FLOW RATE (dscfm)	ACTUAL EMISSIONS Cr 6 (mg/hour)	AVERAGE AMPERAGE (amps)	EMISSIONS Cr 6 (mg/amp-hour)
HOMI-3L	670	6.88	4.610								
HOMI-3F				0.0225							
TEST TOTAL					4.6321	46.707	0.0992	1724	10258.5	1584	6.476
HOMI-4L	850	9.50	8.075								
HOMI-4F				0.0120							
TEST TOTAL					8.0870	45.896	0.1762	1703	18004.4	1645	10.945
AVERAGE							0.1377	1714	14131.5	1615	8.711

TABLE 3A: TOTAL CHROME EMISSIONS FROM AN UNCONTROLLED HARD CHROME PLATING TANK AT HIGH LOAD

TEST DATE: 11/2/89
POLLYBALLS: None
ADDITIVE: None
AMPERAGE: Nominally 2400 A

HOMI-5L Sample liquid from the impingers in the sample train for test HOMI-5.
HOMI-5F Sample caught on the filter in the sample train for test HOMI-5.
HOMI-6L Sample liquid from the impingers in the sample train for test HOMI-6.
HOMI-6F Sample caught on the filter in the sample train for test HOMI-6.

SAMPLE RUN NUMBER	SAMPLE VOLUME (ml)	Conc. Cr T (mg/l)	Impinger Catch Cr T (mg)	Filter Catch Cr T (mg)	Total Catch Cr T (mg)	SAMPLE METER VOL (dscf)	EMISSIONS Cr T (mg/dscf)	STACK FLOW RATE (dscfm)	ACTUAL EMISSIONS Cr T (mg/hour)	AVERAGE AMPERAGE (amps)	EMISSIONS Cr T (mg/amp-hour)
HOMI-5L	920	2.87	2.640								
HOMI-5F				0.0506							
TEST TOTAL					2.6910	45.923	0.0586	1664	5850.4	2568	2.278
HOMI-6L	820	11.40	9.348								
HOMI-6F				0.0116							
TEST TOTAL					9.3596	45.606	0.2052	1695	20871.6	2504	8.335
AVERAGE							0.1319	1680	13361.0	2576	5.307

TABLE 3B: HEXAVALENT CHROME EMISSIONS FROM AN UNCONTROLLED HARD CHROME PLATING TANK AT HIGH LOAD

TEST DATE: 11/2/89
POLLYBALLS: None
ADDITIVE: None
AMPERAGE: Nominally 2400 A

HOMI-5L Sample liquid from the impingers in the sample train for test HOMI-5.
HOMI-5F Sample caught on the filter in the sample train for test HOMI-5.
HOMI-6L Sample liquid from the impingers in the sample train for test HOMI-6.
HOMI-6F Sample caught on the filter in the sample train for test HOMI-6.

SAMPLE RUN NUMBER	SAMPLE VOLUME (ml)	Conc. Cr 6 (mg/l)	Impinger Catch Cr 6 (mg)	Filter Catch Cr 6 (mg)	Total Catch Cr 6 (mg)	SAMPLE METER VOL (dscf)	EMISSIONS Cr 6 (mg/dscf)	STACK FLOW RATE (dscfm)	ACTUAL EMISSIONS Cr 6 (mg/hour)	AVERAGE AMPERAGE (amps)	EMISSIONS Cr 6 (mg/amp-hour)
HOMI-5L	920	2.57	2.364								
HOMI 5F				0.0365							
TEST TOTAL					2.4009	45.923	0.0523	1664	5219.7	2568	2.033
HOMI-6L	820	12.40	10.168								
HOMI-6F				0.0072							
TEST TOTAL					10.1752	45.606	0.2231	1695	22693.4	2504	9.062
AVERAGE							0.1377	1680	13955.1	2536	5.547

TABLE 4A: TOTAL CHROME EMISSIONS FROM A CONTROLLED HARD CHROME PLATING TANK AT LOW LOAD

TEST DATE: 10/23/89
POLLYBALLS: Yes - 100% Surface Coverage
ADDITIVE: OMI Foam-Lok L - 100% Surface Coverage
AMPERAGE: Nominally 800 A

HOMI-7-L Sample liquid from the impingers in the sample train for test HOMI-7.
HOMI-7-F Sample caught on the filter in the sample train for test HOMI-7.
HOMI-8-L Sample liquid from the impingers in the sample train for test HOMI-8.
HOMI-8-F Sample caught on the filter in the sample train for test HOMI-8.

SAMPLE RUN NUMBER	SAMPLE VOLUME (ml)	Conc. Cr T (mg/l)	Impinger Catch Cr T (mg)	Filter Catch Cr T (mg)	Total Catch Cr T (mg)	SAMPLE METER VOL (dscf)	EMISSIONS Cr T (mg/dscf)	STACK FLOW RATE (dscfm)	ACTUAL EMISSIONS Cr T (mg/hour)	AVERAGE AMPERAGE (amps)	EMISSIONS Cr T (mg/amp-hour)
HOMI-7-L	810	0.074	0.0599								
HOMI-7-L				0.0012							
TEST TOTAL					0.0611	46.441	0.0013	1676	132.4	853	0.155
HOMI-8-L	750	0.027	0.0203								
HOMI-8-L				0.0011							
TEST TOTAL					0.0214	46.803	0.0005	1680	46.1	855	0.054
AVERAGE							0.0009	1678	89.2	854	0.105

TABLE 48: HEXAVALENT CHROME EMISSIONS FROM A CONTROLLED HARD CHROME PLATING TANK AT LOW LOAD

TEST DATE: 10/23/89
POLYBALLS: Yes - 100% Surface Coverage
ADDITIVE: GNI Foam-Cop L - 100% Surface Coverage
AMPERAGE: Nominally 800 A

HCMI-7-L Sample liquid from the impingers in the sample train for test HCMI-7.
HCMI-7-F Sample caught on the filter in the sample train for test HCMI-7.
HCMI-8-L Sample liquid from the impingers in the sample train for test HCMI-8.
HCMI-8-F Sample caught on the filter in the sample train for test HCMI-8.

SAMPLE RUN NUMBER	SAMPLE VOLUME (ml)	Conc. Cr 6 (mg/l)	Impinger Catch Cr 6 (mg)	Filter Catch Cr 6 (mg)	Total Catch Cr 6 (mg)	SAMPLE METER VOL (dscf)	EMISSIONS Cr 6 (mg/dscf)	STACK FLOW RATE (dscfm)	ACTUAL EMISSIONS Cr 6 (mg/hour)	AVERAGE AMPERAGE (amps)	EMISSIONS Cr 6 (mg/amp-hour)
HCMI-7-L	810	0.07	0.0557								
HCMI-7-F				0.0030							
TEST TOTAL					0.0587	46.441	0.0012	1675	122.8	853	0.144
HCMI-8-L	750	0.02	0.0150								
HCMI-8-F				0.0000							
TEST TOTAL					0.0150	46.803	0.0003	1680	32.3	855	0.038
AVERAGE							0.0008	1678	77.5	854	0.091

TABLE 5A: TOTAL CHROME EMISSIONS FROM A CONTROLLED HARD CHROME PLATING TANK AT MEDIUM LOAD

TEST DATE: 10/24/89
POLLYBALLS: Yes - 100% Surface Coverage
ADDITIVE: OMI Foam-Lok L - 100% Surface Coverage
AMPERAGE: Nominally 1600 A

HOMI-9-L Sample liquid from the impingers in the sample train for test HOMI-9.
HOMI-9-F Sample caught on the filter in the sample train for test HOMI-9.
HOMI-10-L Sample liquid from the impingers in the sample train for test HOMI-10.
HOMI-10-F Sample caught on the filter in the sample train for test HOMI-10.

SAMPLE RUN NUMBER	SAMPLE VOLUME (ml)	Conc. Cr T (mg/l)	Impinger Catch Cr T (mg)	Filter Catch Cr T (mg)	Total Catch Cr T (mg)	SAMPLE METER VOL (dscf)	EMISSIONS Cr T (mg/dscf)	STACK FLOW RATE (dscfm)	ACTUAL EMISSIONS Cr T (mg/hour)	AVERAGE AMPERAGE (amps)	EMISSIONS Cr T (mg/amp-hour)
HOMI-9-L	995	0.126	0.1254								
HOMI-9-F				0.0016							
TEST TOTAL					0.1270	45.892	0.0028	1695	281.4	1654	0.170
HOMI-10-L	960	0.062	0.0595								
HOMI-10-F				0.0024							
TEST TOTAL					0.0619	46.815	0.0013	1720	136.5	1755	0.078
AVERAGE							0.0020	1708	208.9	1705	0.124

PACIFIC ENVIRONMENTAL SERVICES, INC.

TABLE 3B: HEXAVALENT CHROME EMISSIONS FROM A CONTROLLED HARD CHROME PLATING TANK AT MEDIUM LOAD

TEST DATES: 10/24/89
POLLYBALLS: Yes - 100% Surface Coverage
ADDITIVE: OMI Foam-Lok L - 100% Surface Coverage
AMPERAGE: Nominally 1600 A

HOMI-9-L Sample liquid from the impingers in the sample train for test HOMI-9.
HOMI-9-F Sample caught on the filter in the sample train for test HOMI-9.
HOMI-10-L Sample liquid from the impingers in the sample train for test HOMI-10.
HOMI-10-F Sample caught on the filter in the sample train for test HOMI-10.

SAMPLE RUN NUMBER	SAMPLE VOLUME (ml)	Conc. Cr 6 (mg/l)	Impinger Catch Cr 6 (mg)	Filter Catch Cr 6 (mg)	Total Catch Cr 6 (mg)	SAMPLE METER VOL (dscf)	EMISSIONS Cr 6 (mg/dscf)	STACK FLOW RATE (dscfm)	ACTUAL EMISSIONS Cr 6 (mg/hour)	AVERAGE AMPERAGE (amps)	EMISSIONS Cr 6 (mg/amp-hour)
HOMI-9-L	995	0.08	0.0796								
HOMI-9-F				0.0008							
TEST TOTAL					0.0804	45.892	0.0018	1695	178.2	1654	0.108
HOMI-10-L	960	0.07	0.0672								
HOMI-10-F				0.0010							
TEST TOTAL					0.0682	46.815	0.0015	1720	150.3	1755	0.086
AVERAGE							0.0016	1708	164.2	1705	0.097

TABLE 6A: TOTAL CHROME EMISSIONS FROM A CONTROLLED HARD CHROME PLATING TANK AT HIGH LOAD

TEST DATE: 10/25/89
POLYBALLS: Yes - 100% Surface Coverage
ADDITIVE: OMI Foam-Lor L - 100% Surface Coverage
AMPERAGE: Nominally 2400 A

HOMI-11-L Sample liquid from the impingers in the sample train for test HOMI-11.
HOMI-11-F Sample caught on the filter in the sample train for test HOMI-11.
HOMI-12-L Sample liquid from the impingers in the sample train for test HOMI-12.
HOMI-12-F Sample caught on the filter in the sample train for test HOMI-12.

SAMPLE RUN NUMBER	SAMPLE VOLUME (ml)	Conc. Cr T (mg/l)	Impinger Catch Cr T (mg)	Filter Catch Cr T (mg)	Total Catch Cr T (mg)	SAMPLE METER VOL (dscf)	EMISSIONS Cr T (mg/dscf)	STACK FLOW RATE (dscfm)	ACTUAL EMISSIONS Cr T (mg/hour)	AVERAGE AMPERAGE (amps)	EMISSIONS Cr T (mg/amp-hour)
HOMI-11-L	800	0.142	0.1136								
HOMI-11-F				0.0083							
TEST TOTAL					0.1219	45.483	0.0027	1663	267.4	2560	0.104
HOMI-12-L	815	0.131	0.1068								
HOMI-12-F				0.0055							
TEST TOTAL					0.1123	44.347	0.0025	1620	246.1	2405	0.102
AVERAGE							0.0026	1642	256.7	2463	0.103

TABLE 6B: HEXAVALENT CHROME EMISSIONS FROM A CONTROLLED HARD CHROME PLATING TANK AT HIGH LOAD

TEST DATE: 10/25/89
POLLYBALLS: Yes - 100% Surface Coverage
ADDITIVE: ONI Foam-Lot L - 100% Surface Coverage
AMPERAGE: Nominally 2400 A

HOMI-11-L Sample liquid from the impingers in the sample train for test HOMI-11.
HOMI-11-F Sample caught on the filter in the sample train for test HOMI-11.
HOMI-12-L Sample liquid from the impingers in the sample train for test HOMI-12.
HOMI-12-F Sample caught on the filter in the sample train for test HOMI-12.

SAMPLE RUN NUMBER	SAMPLE VOLUME (ml)	Conc. Cr 6 (mg/l)	Impinger Catch Cr 6 (mg)	Filter Catch Cr 6 (mg)	Total Catch Cr 6 (mg)	SAMPLE METER VOL (dscf)	EMISSIONS Cr 6 (mg/dscf)	STACK FLOW RATE (dscfm)	ACTUAL EMISSIONS Cr 6 (mg/hour)	AVERAGE AMPERAGE (amps)	EMISSIONS Cr 6 (mg/amp-hour)
HOMI-11-L	800	0.15	0.1200								
HOMI-11-F				0.0028							
TEST TOTAL					0.1228	45.483	0.0027	1663	269.4	2560	0.105
HOMI-12-L	815	0.13	0.1060								
HOMI-12-F				0.0024							
TEST TOTAL					0.1084	44.347	0.0024	1620	237.5	2405	0.099
AVERAGE							0.0026	1642	253.4	2483	0.102

TABLE 7: SUMMARY OF RESULTS AND PERCENT REDUCTION EFFICIENCY FOR OMI'S FOAM LOK L.

TEST NUMBERS	AVERAGE AMPERAGE	AVERAGE EMISSIONS Cr T (mg/amp-hour)	AVERAGE EMISSIONS Cr 6 (mg/amp-hour)	REDUCTION EFFICIENCY Cr T	REDUCTION EFFICIENCY Cr 6
HOMI-1 & HOMI-2	843	7.681	7.008		
HOMI-7 & HOMI-8	854	0.105	0.091	98.6	98.7
HOMI-3 & HOMI-4	1615	9.493	8.711		
HOMI-9 & HOMI-10	1705	0.124	0.097	98.7	98.9
HOMI-5 & HOMI-6	2536	5.307	5.547		
HOMI-11 & HOMI-12	2483	0.103	0.102	98.1	98.2
AVERAGE REDUCTION				98.5	98.6

TABLE 8:
FRACTION OF THE TOTAL CHROME
MEASURED AS HEXAVALENT CHROME

TEST NUMBER	MG/TEST CrT	MG/TEST Cr6	PERCENT Cr6
HOMI-1	1.568	1.461	93
HOMI-2	4.357	3.944	91
HOMI-3	5.540	4.632	84
HOMI-4	8.225	8.087	98
HOMI-5	2.691	2.401	89
HOMI-6	9.360	10.175	100 *
HOMI-7	0.061	0.057	93
HOMI-8	0.021	0.015	71
HOMI-9	0.127	0.080	63
HOMI-10	0.062	0.068	100 *
HOMI-11	0.122	0.123	100 *
HOMI-12	0.122	0.108	97
AVERAGE			90

* When hexavalent chrome concentrations exceeded total chrome concentrations, the percent Cr^6 is reported as 100 percent. The analyses are conducted by two different laboratory procedures.

QUALITY ASSURANCE/QUALITY CONTROL

All sampling devices were constructed and calibrated as specified in EPA reference Methods 2 and 5 of 40 CFR 60, APTD-0576, and APTD-0581. The meter box was not moved from the site during the test series. It was calibrated before and after the tests to make sure that the gas meter correction factor remained within tolerance during the tests.

To ensure that the sampling trains were clean for each day of testing, all glassware and probe lines were cleaned with 0.1 normal nitric acid solution, 0.1 normal sodium hydroxide solution, distilled water, and acetone. The sampling trains were then capped until the next tests.

To demonstrate that the sampling trains remained free from contamination, a field train blank was run for each day of testing. An extra sampling train was taken to the site each day and placed near the actual sampling train. The sample from the field train blank was retrieved along with samples from the trains used for the tests. Results from five of the six days showed that the amount of hexavalent chrome in the trains was below detectable amounts and that the amount of total chrome was below 0.004 mg/liter for the liquid sample and below 0.2 micrograms for filter samples (Table 9). The train blank on the fourth day of testing, November 6, 1989, showed contamination, with results of 0.015 mg/liter for hexavalent chrome and 0.048 mg/liter for total chrome.

Extra care was used during sample retrieval. Clean rubber stoppers were used to cap the trains. Each sampling train was rinsed three times with 0.1 normal sodium hydroxide solution after the each test and these rinses were added to the respective sample. Disposable rubber gloves were worn during sample retrieval to help eliminate contamination. All sample volumes and weights were recorded immediately on sample recovery sheets during charging and sample recovery.

TABLE 9: RESULTS OF FIELD TRAIN BLANKS

TEST DATE	LIQUID Cr6	LIQUID CrT	FILTER Cr6	FILTER CrT
10-31-89	<0.003 mg/l	0.001 mg/l	<0.5 ug	<0.2 ug
11-01-89	<0.003 mg/l	0.002 mg/l	<0.5 ug	<0.2 ug
11-02-89	<0.003 mg/l	0.004 mg/l	<0.5 ug	<0.2 ug
11-06-89	0.015 mg/l *	0.048 mg/l *	<0.5 ug	0.2 ug
11-07-89	<0.003 mg/l	<0.001 mg/l	<0.5 ug	<0.2 ug
11-08-89	<0.003 mg/l	0.002 mg/l	<0.5 ug	<0.2 ug

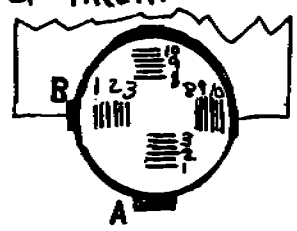
* The train blank on 11/6/89 showed apparent contamination.

APPENDIX

FIELD DATA

Plant SIZE CONTROL - LA PUENTE, CA.
Date 10-31-89
Sampling Location TANK 1 INLET
Sample Type CARB METHOD 425 CHROME
Run Number HOMI-1
Operator SIMON
Ambient Temperature 75°F
Barometric Pressure 29.95
Static Pressure (P_s) -5.4" H_2O
Filter Number(s) HOMI-1F
Pretest Leak Rate = 0.003 cfm @ 15.0 in. Hg
Pretest Pitot Leak Check O.K.
Pretest Orsat Leak Check Not Applicable
Read and Record all Data Every 3 Minutes

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type 18" glass-lined SS
Pitot Tube I.D. No. S-1A
Nozzle I.D. 23P d=0.299
Assumed Moisture, % 20%

Meter Box Number 1A
Meter $\Delta H_@$ 1.846
C Factor 1.15
Meter Gamma 1.011

Reference Δp 0.913
Post Test Leak Rate = 0.005 cfm @ 15.0 in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check Not Applicable
Impinger Box No. 1B
Blank = 4B

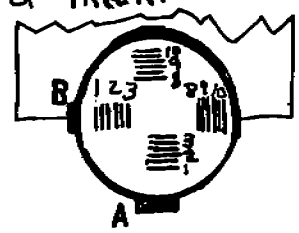
Traverse Point Number	Sampling Time, (min) /	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0	10:21	000.952	0.39	3.70	✓	76	74	73	7.5		56
A2	3	10:24	004.0	0.26	2.45	✓	76	76	74	5.0		52
A2	6	10:27	006.4	0.19	1.85	✓	76	78	74	4.0		56
A3	9	1030	008.8	0.20	1.90	✓	76	81	75	4.0		55
A4	12	1033	011.0	0.20	1.90	✓	76	82	75	4.0		55
A5	15	1036	013.1	0.23	2.15	✓	77	83	76	4.5		56
A6	18	1039	015.2	0.24	2.25	✓	78	85	77	5.0		56
A7	21	1042	017.5	0.26	2.45	✓	78	86	77	5.0		56
A8	24	1045	020.0	0.27	2.55	✓	79	87	78	5.0		57
A9	27	1048	022.6	0.25	2.35	✓	78	88	79	5.0		57
SWITCH A10	30	1051	024.857	0.26	2.45	✓	79	85	80	5.0		58
START AT 1055 B1	33	1058	027.5	0.21	2.00	✓	79	88	80	4.0		56
B2	36	1101	029.6	0.22	2.05	✓	79	89	81	4.0		58
B3	39	1104	031.8	0.22	2.05	✓	80	90	82	4.0		57
B4	42	1107	034.1	0.23	2.15	✓	80	91	82	4.0		57
B5	45	1110	036.2	0.25	2.35	✓	81	92	83	5.0		58
B6	48	1113	038.7	0.25	2.35	✓	80	92	83	5.0		58
B7	51	1116	041.3	0.23	2.15	✓	81	93	84	4.5		57
B8	54	1119	043.5	0.21	2.00	✓	81	94	85	4.0		57
B9	57	1122	045.7	0.22	2.05	✓	81	94	85	4.0		59
B10	60	1125	047.64		STOP - END OF TEST							
			766.52	0.2878	$\overline{\Delta H}$ = 2.26	$\overline{T_s}$ = 533.6		$\overline{T_m}$ = 542.8				

PACIFIC ENVIRONMENTAL SERVICES, INC.

FIELD DATA

Plant SIZE CONTROL - LA PUENTE, CA.
Date 10-31-89
Sampling Location TANK 1 INLET
Sample Type CARB METHOD 425 CHROME
Run Number HOME-2
Operator SIMON
Ambient Temperature 75°F
Barometric Pressure 29.95" Hg
Static Pressure (P_s) -5.4" H2O
Filter Number(s) HOME-2F
Pretest Leak Rate = 0.008 cfm @ 15.5 in. Hg
Pretest Pitot Leak Check OK
Pretest Orsat Leak Check Not Applicable
Read and Record all Data Every 3 Minutes

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type 18" glass-lined SS
Pitot Tube I.D. No. S-1A
Nozzle I.D. 0.48 D=0.310
Assumed Moisture, % 2.0

Meter Box Number 1A
Meter $\Delta H_@$ 1.946
C Factor 1.15
Meter Gamma 1.011

Reference Δp 0.195
Post Test Leak Rate = 0.010 cfm @ 15. in. Hg
Post Test Pitot Leak Check OK
Post Test Orsat Leak Check Not Applicable
Impinger Box No. 2B

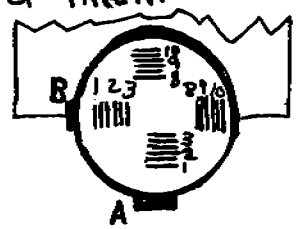
Traverse Point Number	Sampling Time, (min)	/ Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0	1212	047.911	0.31	3.0	✓	81	84	84	6.5		67
A1	3	1215	050.1	0.25	2.35	✓	82	85	83	5.0		54
A2	6	1218	053.0	0.20	1.90	✓	82	88	84	4.0		54
A3	9	1221	055.1	0.20	1.90	✓	82	89	85	4.0		54
A4	12	1224	057.3	0.21	1.95	✓	82	90	85	4.0		55
A5	15	1227	059.7	0.23	2.15	✓	83	92	85	4.5		56
A6	18	1230	062.0	0.25	2.35	✓	82	93	86	5.0		56
A7	21	1233	064.3	0.25	2.35	✓	83	94	86	5.0		56
A8	24	1236	066.7	0.26	2.45	✓	83	95	87	5.0		57
A9	27	1239	069.2	0.27	2.50	✓	82	96	87	5.0		57
A10	30	1242	071.635	0.26	2.45	✓	83	93	88	5.0		58
SWITCH START AT 1245 → B1	33	1248	074.1	0.23	2.15	✓	83	95	88	4.5		59
B2	36	1251	076.5	0.21	1.95	✓	83	96	88	4.0		59
B3	39	1254	078.7	0.22	2.05	✓	83	96	89	4.0		60
B4	42	1257	081.0	0.22	2.05	✓	83	97	89	4.0		60
B5	45	1300	083.2	0.24	2.25	✓	82	97	90	5.0		60
B6	48	1303	085.8	0.23	2.15	✓	82	97	90	4.5		61
B7	51	1306	088.0	0.21	1.95	✓	83	98	90	4.0		60
B8	54	1309	090.2	0.21	1.95	✓	83	98	91	4.0		61
B9	57	1312	092.5	0.22	2.05	✓	83	98	91	4.0		61
B10	60	1315	094.7		STOP - END OF TEST							
		/										
		/	46.793		2.1		82.5	Tm =	550.4			
		/										

PACIFIC ENVIRONMENTAL SERVICES, INC.

FIELD DATA

Plant SIZE CONTROL - LA PUENTE, CA.
Date 11-1-89
Sampling Location TANK 1 INLET
Sample Type CARB METHOD 425 CHROME
Run Number HOMZ-3
Operator SIMON
Ambient Temperature 75°F
Barometric Pressure 30.06" Hg
Static Pressure (P_s) -0.19" H_2O
Filter Number(s) HOMZ-3F
Pretest Leak Rate = 0.006 cfm @ 15.0 in. Hg
Pretest Pitot Leak Check OK
Pretest Orsat Leak Check Not Applicable
Read and Record all Data Every 3 Minutes

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type 18" glass-lined SS
Pitot Tube I.D. No. S-1A
Nozzle I.D. 14 p. d = 0.300"
Assumed Moisture, % 2.0

Meter Box Number 1A
Meter $\Delta H_@$ 1.846
C Factor 1.15
Meter Gamma 1.011

Reference Δp ~~0.195~~ 0.195
Post Test Leak Rate = 0.010 cfm @ 16.0 in. Hg
Post Test Pitot Leak Check OK
Post Test Orsat Leak Check Not Applicable
Impinger Box No. 4B
Blank = 2B

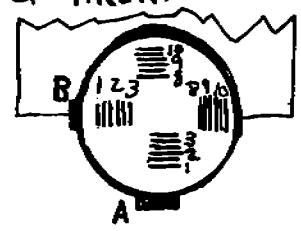
Traverse Point Number	Sampling Time, (min) /	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0	1010	094.717	0.27	2.60	✓	72	68	67	6.0		53
A2	3	1013	097.1	0.24	2.30	✓	72	68	66	5.5		46
A2	6	1016	099.5	0.22	2.05	✓	72	71	67	5.0		49
A3	9	1019	101.8	0.22	2.05	✓	73	73	67	5.0		50
A4	12	1022	104.0	0.23	2.15	✓	73	75	68	5.0		51
A5	15	1025	106.2	0.25	2.35	✓	73	77	69	5.0		52
A6	18	1028	108.5	0.26	2.45	✓	74	79	70	5.5		52
A7	21	1031	111.0	0.27	2.60	✓	74	81	71	6.0		53
A8	24	1034	113.4	0.25	2.35	✓	75	83	72	5.5		53
A9	27	1037	115.8	0.19	1.85	✓	77	85	73	4.5		54
A10	30	1040	118.030	0.31	2.95	✓	77	80	75	6.5		62
SWITCH START AT 1045 B1	33	1043	120.17	0.26	2.55	✓	77	86	76	6.0		53
B2	36	1051	123.2	0.22	2.05	✓	77	87	76	5.0		54
B3	39	1054	125.5	0.23	2.15	✓	76	88	77	5.0		56
B4	42	1057	127.8	0.21	2.00	✓	77	89	79	5.0		55
B5	45	1100	130.0	0.23	2.15	✓	78	90	79	5.0		56
B6	48	1103	132.3	0.24	2.30	✓	78	91	80	5.0		56
B7	51	1106	134.6	0.22	2.05	✓	79	92	81	5.0		56
B8	54	1109	137.0	0.21	2.00	✓	78	92	81	5.0		56
B9	57	1112	139.2	0.19	1.85	✓	79	93	81	4.5		56
B10	60	1115	141.344		STOP - END OF TEST							
		/						$\bar{T}_m$	538.1			
		/ $\bar{V}_m$	46.627		$\bar{\Delta H}$ 2.24	$\bar{T}_s$	535.6					
		/		0.4879								

PACIFIC ENVIRONMENTAL SERVICES, INC.

FIELD DATA

Plant SIZE CONTROL - LA PUENTE, CA.
Date
Sampling Location TANK 1 INLET
Sample Type CARB METHOD 425 CHROME
Run Number HOMI-4
Operator PARKS
Ambient Temperature 75° F
Barometric Pressure 30.06" Hg
Static Pressure (P_s) -0.54" H_2O
Filter Number(s) HOMI-4F
Pretest Leak Rate = 0.002 cfm @ 15 in. Hg
Pretest Pitot Leak Check ✓
Pretest Orsat Leak Check Not Applicable
Read and Record all Data Every 3 Minutes

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type 18" glass-lined SS
Pitot Tube I.D. No. "S" 1A
Nozzle I.D. 04P
Assumed Moisture, % 2.0
Meter Box Number 1A
Meter $\Delta H_@$ 1.846
C Factor 1.15
Meter Gamma 1.011
Reference Δp 0.195
Post Test Leak Rate = 0.005 cfm @ 15 in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check Not Applicable
Impinger Box No. 3B

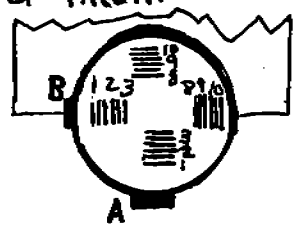
Traverse Point Number	Sampling Time, (min) /	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0	1210	141.629	0.41	0.8	3.8	82	85	83	10		61
A1	3	1213	144.5	0.22	2.05	2.05	83	89	84	6.0		57
A2	6	1216	147.0	0.18	1.7	1.7	83	91	85	5.0		58
A3	9	1219	149.2	0.21	1.95	1.95	83	91	85	5.0		59
A4	12	1222	151.3	0.21	1.95	1.95	83	94	86	5.0		59
A5	15	1225	153.5	0.24	2.2	2.2	84	95	86	5.0		58
A6	18	1228	155.7	0.26	2.4	2.4	84	95	87	6.2		58
A7	21	1231	157.9	0.26	2.4	2.4	84	96	87	6.2		58
A8	24	1234	160.4	0.25	2.3	2.3	84	98	88	6.0		58
A9	27	1237	163.1	0.25	2.3	2.3	84	98	89	6.0		58
SWITCH START AT 1244 A10	30	1240	165.43	0.28	2.6	2.6	84	95	89	6.5		62
B1	33	1247	167.9	0.19	1.85	1.85	84	97	89	6.0		60
B2	36	1250	170.4	0.20	1.9	1.9	84	99	91	5.0		58
B3	39	1253	173.2	0.22	2.0	2.0	83	99	91	5.0		59
B4	42	1256	175.0	0.22	2.0	2.0	83	100	91	5.0		59
B5	45	1259	177.3	0.24	2.2	2.2	83	100	91	5.5		59
B6	48	1302	179.7	0.24	2.2	2.2	84	101	92	5.5		59
B7	51	1305	181.9	0.23	2.15	2.15	85	101	93	5.5		60
B8	54	1308	184.3	0.21	1.95	1.95	84	102	93	5.0		60
B9	57	1311	186.5	0.21	1.95	1.95	84	102	94	5.0		60
B10	60	1314	188.686		STOP - END OF TEST							
								$\bar{T}_m$ = 552.6				
					110.19	$\bar{T}_s$	83.6					
			47.057	ΔP = 0.483								

PACIFIC ENVIRONMENTAL SERVICES, INC.

FIELD DATA

Plant SIZE CONTROL - LA PUENTE, CA.
Date 11-2-89
Sampling Location TANK 1 INLET
Sample Type CARB METHOD 425 CHROME
Run Number HOMT-5
Operator SIMON
Ambient Temperature 75°F
Barometric Pressure 30.08" Hg
Static Pressure (P_s) -0.54" H_2O
Filter Number(s) HOMT-5F
Pretest Leak Rate = 0.010 cfm @ 15.0 in. Hg
Pretest Pitot Leak Check ~~0.010~~ O.K.
Pretest Orsat Leak Check Not Applicable
Read and Record all Data Every 3 Minutes

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type 18" glass-lined SS
Pitot Tube I.D. No. S-1A
Nozzle I.D. 1AP d=0.300"
Assumed Moisture, % 2.0

Meter Box Number 1A
Meter $\Delta H_@$ 1.896
C Factor 1.15
Meter Gamma 1.011

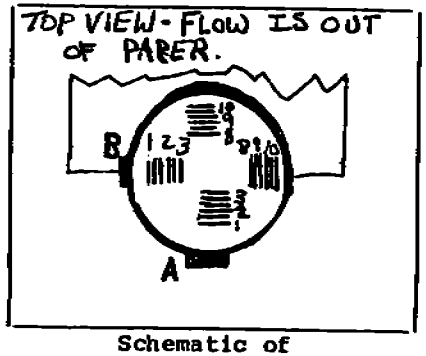
Reference Δp 0.195
Post Test Leak Rate = 0.012 cfm @ 16.5 in. Hg
Post Test Pitot Leak Check O.K.
Post Test Orsat Leak Check Not Applicable
Impinger Box No. 1B
Blank = 2B

Traverse Point Number	Sampling Time, (min)	/ Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0	1018	190.489	0.37	2.95	✓	78	74	72	5.0		60
A1	3	1021	193.1	0.25	2.40	✓	79	76	73	4.5		54
A2	6	1024	195.6	0.20	1.88	✓	79	80	73	3.5		56
A3	9	1027	197.8	0.20	1.90	✓	80	80	73	3.5		58
A4	12	1030	DIDNT OBSERVE	0.20	1.90	✓	80	83	75	3.5		60
A5	15	1033	202.1	0.23	2.20	✓	81	85	76	3.5		62
A6	18	1036	204.5	0.25	2.35	✓	82	87	77	3.5	4.0	61
A7	21	1039	206.9	0.26	2.45	✓	82	83	78	4.0		62
A8	24	1042	209.6	0.25	2.35	✓	82	90	79	4.0		61
A9	27	1045	211.8	0.25	2.35	✓	82	91	79	4.0		62
SWITCH A10	30	1048	214.151	0.24	2.30	✓	83	87	82	4.0		66
START AT 1052 B1	33	1050	216.5	0.23	2.20	✓	83	90	82	4.0		60
B2	36	1058	219.0	0.21	1.95	✓	83	92	83	3.5		61
B3	39	1101	221.1	0.22	2.05	✓	83	95	83	3.5		62
B4	42	1104	223.6	0.20	1.90	✓	84	94	85	3.0		62
B5	45	1107	225.5	0.22	2.05	✓	84	94	85	3.5		62
B6	48	1110	228.0	0.23	2.20	✓	84	94	86	3.5		62
B7	51	1113	230.3	0.21	1.95	✓	85	95	86	3.0		63
B8	54	1116	232.5	0.20	1.85	✓	84	96	87	3.0		62
B9	57	1119	234.9	0.18	1.70	✓	85	96	88	3.0		63
B10	60	1122	236.315	—	STOP - END OF TEST			—				
		/										
		/	46.326		2.15	100.1	82.2	Tm	52.4			
		/		ΔP - 0.4736								

PACIFIC ENVIRONMENTAL SERVICES, INC.

FIELD DATA

Plant SIZE CONTROL - LA PUENTE, CA.
Date 11-2-89
Sampling Location TANK 1 INLET
Sample Type CARB METHOD 425 CHROME
Run Number HAMI-6
Operator PARKS
Ambient Temperature 86° F
Barometric Pressure 30.08" Hg
Static Pressure (P_s) - 0.51" H_2O
Filter Number(s) HDUI-6F
Pretest Leak Rate = 0.010 cfm @ 15.5 in. Hg
Pretest Pitot Leak Check ✓
Pretest Orsat Leak Check Not Applicable
Read and Record all Data Every 3 Minutes



Schematic of Traverse Point Layout

Probe Length and Type 18" glass-lined SS
Pitot Tube I.D. No. 35" 1A
Nozzle I.D. 03P 0.299" I.D.
Assumed Moisture, % 2

Meter Box Number 1A
Meter $\Delta H_@$ 1.806
C Factor 1.15
Meter Gamma 1.011

Reference Δp 0.195
Post Test Leak Rate = 0.010 cfm @ 14" in. Hg
Post Test Pitot Leak Check ✓
Post Test Orsat Leak Check Not Applicable
Impinger Box No. 4B

Traverse Point Number	Sampling Time, (min)	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0	1206	237.410	0.35	3.3	3.3	91	89	88	7		68
A2	3	1209	240.2	0.27	1.95	1.95	88	91	88	4.8		68
A2	6	1212	242.7	0.18	1.7	1.7	88	94	88	4		66
A3	9	1215	244.7	0.23	2.15	2.15	88	95	89	5		65
A4	12	1218	247.0	0.20	1.9	1.9	88	97	89	5		65
A5	15	1221	249.3	0.24	2.2	2.2	88	98	90	5		64
A6	18	1224	251.6	0.25	2.3	2.3	88	98	90	5		62
A7	21	1227	254.0	0.26	2.4	2.4	88	100	91	5.2		61
A8	24	1230	256.6	0.23	2.15	2.15	89	101	92	5.0		62
A9	27	1233	259.0	0.22	2.05	2.05	88	101	92	5.0		63
A10	30	1236	261.231	0.34	3.2	3.2	89	98	92	6.6		65
B1	33	1242	264.0	0.20	1.9	1.9	88	101	93	4.4		62
B2	36	1245	266.3	0.21	1.95	1.95	88	102	94	4.5		64
B3	39	1248	268.7	0.22	2.05	2.05	88	102	94	5.6		64
B4	42	1251	270.9	0.23	2.15	2.15	87	102	95	5.0		64
B5	45	1254	273.3	0.22	2.05	2.05	87	103	95	5.0		64
B6	48	1257	275.6	~~0.23~~ 0.24	2.2	2.2	88	102	95	5.0		65
B7	51	1300	278.0	0.23	2.15	2.15	87	103	95	5.0		65
B8	54	1303	280.2	0.21	1.95	1.95	87	103	96	5.0		65
B9	57	1306	282.6	0.22	2.05	2.05	87	103	96	5.0		65
B10	60	1309	284.343		STOP - END OF TEST							
				ΔP								
			46.983	0.1826	2.19	35	548	Tm	555.6			

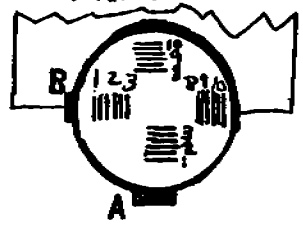
SWITCH START AT 1239

PACIFIC ENVIRONMENTAL SERVICES, INC.

FIELD DATA

Plant SIZE CONTROL - LA PUENTE, CA.
Date 11-6-89
Sampling Location TANK 1 INLET
Sample Type CARB METHOD 425 CHROME
Run Number HOMI-8
Operator SIMON / PARKS
Ambient Temperature 70 F
Barometric Pressure 30.12
Static Pressure (P_s) -0.53" H_2O
Filter Number(s) HOMI-8F
Pretest Leak Rate = 0.012 cfm @ 15.0 in. Hg
Pretest Pitot Leak Check 0.13
Pretest Orsat Leak Check Not Applicable
Read and Record all Data Every 3 Minutes

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type 18" glass-lined SS
Pitot Tube I.D. No. S-1A
Nozzle I.D. 0.38 0.399" I.D.
Assumed Moisture, % 2%

Meter Box Number 1A
Meter $\Delta H_@$ 1.846
C Factor ~~1.04~~ 1.15
Meter Gamma 1.011

Reference Δp 0.195
Post Test Leak Rate = 0.00 cfm @ 16.0 in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check Not Applicable
Impinger Box No. 4B

Traverse Point Number	Sampling Time, (min)	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0	1326	331.914	0.33	3.15	✓	81	80	77	3.5		54
A1	3	1329	334.8	0.21	2.00	2.3	75	79	77	3.0	(took picture of Tank) #10	55
A2	6	1332	DIDN'T SEE	0.20	1.90	✓	76	80	77	3.5		55
A3	9	1335	339.7	0.22	2.10	✓	74	82	79	4.0		56
A4	12	~~1340~~ 1338	341.8	0.20	1.90	✓	75	83	79	3.5		56
A5	15	1341	344.1	0.20	1.90	✓	75	84	78	4.0		57
A6	18	1344	346.3	0.24	2.20	✓	76	86	79	4.1		57
A7	21	1347	348.5	0.25	2.35	✓	76	87	80	4.5		58
A8	24	1350	350.9	0.25	2.35	✓	74	88	80	4.5		58
A9	27	1353	353.6	0.23	2.15	✓	74	89	81	4.3		58
A10	30	1356	355.273	0.24	2.15	✓	78	85	78	4.5	(Took picture of tank) #11	62
B1	33	1405	358.4	0.24	2.25	✓	76	89	83	4.0		56
B2	36	1408	360.8	0.22	2.10	✓	76	90	82	4.0		57
B3	39	1411	363.2	0.22	2.10	✓	76	92	83	4.50		59
B4	42	1414	365.7	0.21	2.00	✓	76	92	84	4.0		60
B5	45	1417	368.1	0.21	2.00	✓	77	92	84	3.5		60
B6	48	1420	370.1	0.23	2.15	✓	76	92	84	4.0		60
B7	51	1423	372.3	0.22	2.10	✓	77	93	84	4.0		61
B8	54	1426	374.4	0.23	2.15	✓	76	93	85	4.0		61
B9	57	1429	377.0	0.19	1.85	✓	77	93	85	3.0		61
B10	60	1432	379.115	—	STOP - END OF TEST		—				(Took picture of tank) #12	
			Total = 47.201	0.1780	2.17		976.1	Tm =	544.6	—		

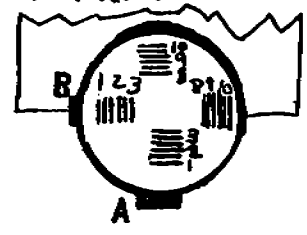
SWITCH START 1402

FIELD DATA

Plant SIZE CONTROL - LA PUENTE, CA.
Date 11-6-91
Sampling Location TANK 1 INLET
Sample Type CARB METHOD 425 CHROME
Run Number HOMI-7
Operator SIMON
Ambient Temperature 75°F Sunny
Barometric Pressure 30.12" Hg
Static Pressure (P_s) -0.54
Filter Number(s) HOMI-7F
Pretest Leak Rate = 0.0 cfm @ 15.0 in. Hg
Pretest Pitot Leak Check O.K.
Pretest Orsat Leak Check Not Applicable
Read and Record all Data Every 3 Minutes

11-6 conc = 35.1 oz/gal Cr^{+6} and 0.26 oz/gal SO_4^{2-}

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type 18" glass-lined SS
Pitot Tube I.D. No. S-1A
Nozzle I.D. 14P d = 0.300"
Assumed Moisture, % 2.0%

Meter Box Number 1A
Meter $\Delta H_@$ 1.846
C Factor 1.15
Meter Gamma 1.011

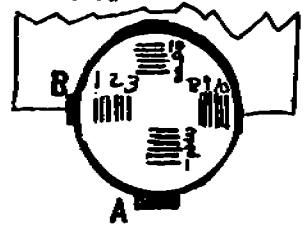
Reference Δp 0.195
Post Test Leak Rate = 0.011 cfm @ 15.5 in. Hg
Post Test Pitot Leak Check O.K.
Post Test Orsat Leak Check Not Applicable
Impinger Box No. ~~1A~~ 1B
Bkt-E = ~~1B~~ 3B

Traverse Point Number	Sampling Time, (min)	/ Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
START AT 0959 A1	0	/ ~~0958~~	283.343	0.29	~~1.95~~	2.15 ✓	70	70	69	4.50		53
A2	3	/ 1002	287.8	0.19	1.85	✓	71	70	69	4.0		48
A2	6	/ 1005	289.8	0.20	1.90	✓	71	73	69	4.0		52
A3	9	/ 1008	291.9	0.21	1.95	✓	70	75	70	4.0		56
A4	12	/ 1011	294.1	0.20	1.90	✓	69	77	71	4.0		57
A5	15	/ 1014	296.0	0.24	2.25	✓	70	78	71	4.5		57
A6	18	/ 1017	298.5	0.26	2.45	✓	72	80	72	5.0		59
A7	21	/ 1020	300.9	0.26	2.45	✓	71	81	73	5.0		60
A8	24	/ 1023	303.1	0.25	2.35	✓	71	83	73	5.0		61
A9	27	/ 1026	305.9	0.24	2.25	✓	70	84	75	4.5		61
A10	30	/ 1029	308.06	0.19	1.85	✓	72	79	75	4.0		61
SWITCH START 1035 B1	33	/ 1038	311.2	0.23	2.15	✓	73	83	76	4.0		61
B2	36	/ 1041	313.4	0.22	2.05	✓	73	84	76	4.0		58
B3	39	/ 1044	315.8	0.21	1.95	✓	72	86	77	4.0		60
B4	42	/ 1047	318.0	0.22	2.05	✓	72	86	77	4.0		60
B5	45	/ 1050	320.2	0.23	2.15	✓	73	87	78	4.0		61
B6	48	/ 1053	322.5	0.23	2.15	✓	72	88	78	4.0		61
B7	51	/ 1056	324.9	0.24	2.25	✓	71	88	79	4.5		62
B8	54	/ 1059	327.2	0.22	2.05	✓	72	89	79	4.0		62
B9	57	/ 1102	329.4	0.21	1.95	✓	72	89	80	4.0		61
B10	60	/ 1105	331.398		STOP - END OF TEST							
		/			(2.71)			T_m	537.9			
		/	48.369	0.4738			531.4					

FIELD DATA

Plant: SIZE CONTROL - LA PUENTE, CA.
Date: 11-7-89
Sampling Location: TANK 1 INLET
Sample Type: CARB METHOD 425 CHROME
Run Number: HOMI-9
Operator: SIMON
Ambient Temperature: 75°F overcast
Barometric Pressure: 29.99" Hg
Static Pressure (P_s): -0.54" H_2O
Filter Number(s): HOMI-9F
Pretest Leak Rate = 0.004 cfm @ 15.0 in. Hg
Pretest Pitot Leak Check: O.K.
Pretest Orsat Leak Check: Not Applicable
Read and Record all Data Every 3 Minutes

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type: 18" glass-lined SS
Pitot Tube I.D. No.: S-1A
Nozzle I.D.: OFP 0.300" I.D.
Assumed Moisture, %: 2.0

Meter Box Number: 1A
Meter $\Delta H_@$: 1.946
C Factor: 1.15
Meter Gamma: 1.011

Reference Δp: 0.195
Post Test Leak Rate = ___ cfm @ ___ in. Hg
Post Test Pitot Leak Check: ___
Post Test Orsat Leak Check: Not Applicable
Impinger Box No.: 3B
Blank = 2B

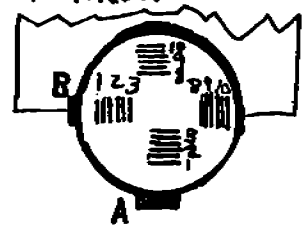
Traverse Point Number	Sampling Time, (min) / Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft³	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Orifice Pres. Differential (ΔH) in. H_2O Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Dry Gas Meter Temp. Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0 / 1015	379.524	0.27	2.55	✓	73	69	69	5.0		53
A1	3 / 1015	382.0	0.25	2.40	✓	71	72	69	4.0		54
A2	6 / 1018	384.5	0.19	1.90	✓	71	75	70	3.5		55
A3	9 / 1021	386.7	0.20	1.90	✓	72	76	70	3.5		55
A4	12 / 1024	388.3	0.21	2.00	✓	73	78	71	4.0		54
A5	15 / 1027	391.0	0.24	2.25	✓	73	80	71	4.5		55
A6	18 / 1030	393.1	0.26	2.40	✓	73	81	72	4.5		55
A7	21 / 1033	396.0	0.26	2.45	✓	72	82	73	4.5		55
A8	24 / 1036	398.2	0.24	2.25	✓	72	83	73	4.0		55
A9	27 / 1039	400.6	0.20	1.90	✓	74	84	74	3.5		55
SWITCH A10	30 / 1042	402.319	0.23	2.20	✓	73	79	75	4.5		54
START AT 1046 B1	33 / 1049	404.5	0.22	2.05	✓ 2.15	73	83	75	4.0		54
B2	36 / 1052	407.0	0.22	2.05	✓	73	84	76	4.0		54
B3	39 / 1055	409.4	0.21	2.00	✓	72	89	76	4.0		54
B4	42 / 1058	411.3	0.23	2.20	✓	72	86	77	4.0		54
B5	45 / 1101	413.9	0.24	2.25	✓	73	86	77	4.5		54
B6	48 / 1104	416.2	0.23	2.10	✓	74	87	78	4.0		55
B7	51 / 1107	418.5	0.23	2.10	✓	74	87	78	4.0		54
B8	54 / 1110	420.9	0.24	2.25	✓	73	87	79	4.5		54
B9	57 / 1113	423.2	0.20	1.90	✓	73	89	79	4.0		55
B10	60 / 1116	425.423	—	STOP - END OF TEST			—				
	/		ΔP:								
	/	V_m = 45.904	0.2770			5117		53.78			
	/										

ΔH = 0.15

FIELD DATA

Plant SIZE CONTROL - LA PUENTE, CA.
Date 11-7-89
Sampling Location TANK 1 INLET
Sample Type CARB METHOD 425 CHROME
Run Number HONI-10
Operator PARKS
Ambient Temperature 80°F OVERCAST
Barometric Pressure 29.99
Static Pressure (P_s) -0.5" H_2O
Filter Number(s) HONI-10F
Pretest Leak Rate = 0.005 cfm @ 15" in. Hg
Pretest Pitot Leak Check ✓
Pretest Orsat Leak Check Not Applicable
Read and Record all Data Every 3 Minutes

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type 18" glass-lined SS
Pitot Tube I.D. No. "S"-1A
Nozzle I.D. 03P 0.299" I.D
Assumed Moisture, % 2%

Meter Box Number 1A
Meter $\Delta H_@$ 1.846
C Factor 1.15
Meter Gamma 1.011

Reference Δp 0.195
Post Test Leak Rate = 0.010 cfm @ 15" in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check Not Applicable
Impinger Box No. 1B

Traverse Point Number	Sampling Time, (min)	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0	1248	426.558	0.26	2.4	✓	75	77	76	4.0		56
A1	3	1251	428.4	0.21	1.95	✓	73	79	76	4.0		52
A2	6	1254	431.2	0.19	1.8	✓	74	82	77	3.0		58
A3	9	1257	433.4	0.21	1.95	✓	74	82	77	4.0		58
A4	12	1300	435.7	0.21	1.95	✓	73	84	78	3.8		59
A5	15	1303	437.9	0.23	2.15	✓	74	85	78	3.9		60
A6	18	1306	440.0	0.25	2.35	✓	74	85	78	4.1		61
A7	21	1309	442.4	0.27	2.55	✓	74	87	79	4.0		62
A8	24	1312	445.0	0.25	2.35	✓	74	88	80	4.3		63
A9	27	1315	447.5	0.23	2.15	✓	76	88	80	4.2		63
A10	30	1318	449.891	0.35	3.3	✓	77	87	81	5.0		59
B1	33	1321	452.7	0.22	2.05	✓	74	88	81	4.0		61
B2	36	1324	455.0	0.22	2.05	✓	74	89	81	4.0		61
B3	39	1327	457.3	0.27	2.55	✓	75	91	83	4.6		62
B4	42	1330	459.8	0.22	2.05	✓	76	90	82	4.0		62
B5	45	1333	462.2	0.25	2.35	✓	76	90	82	4.1		62
B6	48	1336	464.5	0.24	2.25	✓	78	91	83	4.1		63
B7	51	1339	467.0	0.23	2.15	✓	77	91	83	4.1		63
B8	54	1342	469.3	0.215	2.0	✓	76	91	83	4.0		62
B9	57	1345	471.7	0.215	2.0	✓	77	91	83	3.8		63
B10	60	1348	473.892		STOP - END OF TEST							
			$\sqrt{V_m}$ = 47.87		ΔH = 2.32		T_s = 534.5	T_m = 543.4				
				0.4857								

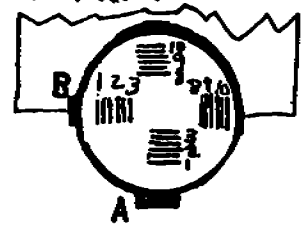
Took PICTURE #13

SWITCH START 1321

FIELD DATA

Plant: SIZE CONTROL - LA PUENTE, CA.
Date: 11-8-89
Sampling Location: TANK 1 INLET
Sample Type: CARB METHOD 425 CHROME
Run Number: HOMT-11
Operator: SIMON
Ambient Temperature: 80°F Sunny
Barometric Pressure: 30.04" Hg
Static Pressure (P_s): -0.54" H_2O
Filter Number(s): HOMT-11F
Pretest Leak Rate = 0.010 cfm @ 15.0 in. Hg
Pretest Pitot Leak Check: OK
Pretest Orsat Leak Check: Not Applicable
Read and Record all Data Every 3 Minutes

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type: 18" glass-lined SS
Pitot Tube I.D. No.: S-1A
Nozzle I.D.: 03P d=0.299"
Assumed Moisture, %: 2.0

Meter Box Number: 1A
Meter $\Delta H_@$: 1.846
C Factor: 1.15
Meter Gamma: 1.011

Reference Δp: 0.195
Post Test Leak Rate = 0.011 cfm @ 15 in. Hg
Post Test Pitot Leak Check: OK
Post Test Orsat Leak Check: Not Applicable
Impinger Box No.: 4B
BLANK = Box 2B

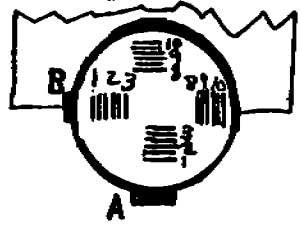
Traverse Point Number	Sampling Time, (min) / Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0 / 1002	474.222	0.25	2.40	✓	72	68	66	4.5		55
A1	3 / 1005	476.7	0.21	2.00	✓	74	70	69	4.0		42
A2	6 / 1008	478.8	0.19	1.80	✓	73	73	67	3.5		42
A3	9 / 1011	481.0	0.20	1.90	✓	73	75	68	3.5		45
A4	12 / 1014	483.1	0.20	1.90	✓	73	77	69	3.5		48
A5	15 / 1017	485.2	0.22	2.10	✓	74	79	70	4.0		50
A6	18 / 1020	487.5	0.23	2.15	✓	74	81	71	4.0		52
A7	21 / 1023	489.8	0.25	2.35	✓	74	81	72	4.5		52
A8	24 / 1026	492.2	0.26	2.45	✓	74	82	73	4.5		54
A9	27 / 1029	494.7	0.24	2.25	✓	74	84	73	4.0		54
A10	30 / 1032	497.059	0.29	2.75	✓	75	79	75	5.0		58
B1	33 / 1035	499.7	0.20	1.90	✓	77	85	76	4.0		52
B2	36 / 1042	502.0	0.20	1.90	✓	76	86	76	4.0		54
B3	39 / 1045	504.0	0.20	1.90	✓	76	87	78	4.0		55
B4	42 / 1048	506.3	0.21	2.00	✓	77	87	78	4.0		56
B5	45 / 1051	508.5	0.21	2.00	✓	76	88	79	4.0		56
B6	48 / 1054	510.8	0.22	2.10	✓	77	89	79	4.0		57
B7	51 / 1057	512.9	0.23	2.15	✓	78	90	80	4.0		56
B8	54 / 1100	515.4	0.22	2.10	✓	78	90	80	4.0		56
B9	57 / 1103	517.9	0.20	1.90	✓	78	90	81	3.5		56
B10	60 / 1106	—	—	STOP - END OF TEST			—	—			
	/	519.663									
	/		SUM = 0.4699			75.2		535			
	/	45.443		1.2.10							

SWITCH START 1036

FIELD DATA

Plant SIZE CONTROL - LA PUENTE, CA.
Date 11-8-89
Sampling Location TANK 1 INLET
Sample Type CARB METHOD 425 CHROME
Run Number HOMI-12
Operator PARKS
Ambient Temperature 80° F
Barometric Pressure 30.04
Static Pressure (P_s) -0.54" H_2O
Filter Number(s) HOMI-12F
Pretest Leak Rate = 0.006 cfm @ 15" in. Hg
Pretest Pitot Leak Check
Pretest Orsat Leak Check Not Applicable
Read and Record all Data Every 3 Minutes

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type 18" glass-lined SS
Pitot Tube I.D. No. S-1A
Nozzle I.D. 04P 0.300" I.D.
Assumed Moisture, % 3%

Meter Box Number 1A
Meter $\Delta H_@$ 1.846
C Factor 1.15
Meter Gamma 1.011

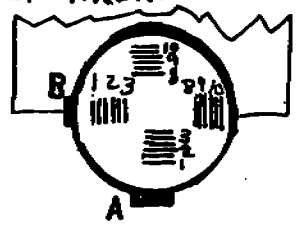
Reference Δp 0.195
Post Test Leak Rate = 0.009 cfm @ 15 in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check Not Applicable
Impinger Box No. 1A

Traverse Point Number	Sampling Time, (min) / Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Orifice Pres. Differential (ΔH) in. H_2O Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Dry Gas Meter Temp. Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0 / 1158	519.787	0.24	2.25	✓	82	83	81	4.0		57
A2	3 / 1201	522.3	0.20	1.90	✓	81	84	82	4.0		61
A2	6 / 1204	524.4	0.17	1.60	✓	81	86	82	3.0		56
A3	9 / 1207	526.5	0.20	1.90	✓	82	88	82	3.4		59
A4	12 / 1210	528.7	0.19	1.80	✓	82	89	83	3.4		61
A5	15 / 1213	530.8	0.23	2.15	✓	83	91	84	3.8		63
A6	18 / 1216	533.0	0.23	2.15	✓	83	92	84	3.8		62
A7	21 / 1219	535.9	0.23	2.15	✓	83	93	85	3.8		63
A8	24 / 1222	537.7	0.20	1.90	✓	84	94	86	3.8		63
A9	27 / 1225	540.0	0.20	1.90	✓	83	95	86	3.5		63
A10	30 / 1228	542.176	0.23	2.15	✓	84	94	87	3.8		62
SWITCH START AT 1231 → B1	33 / 1234	544.5	0.20	2.05	✓	82	96	88	3.8		62
B2	36 / 1237	546.9	0.23	2.15	✓	83	97	88	3.8		63
B3	39 / 1240	549.2	0.22	2.05	✓	82	97	89	3.8		63
B4	42 / 1243	551.4	0.20	1.9	✓	83	98	89	3.8		64
B5	45 / 1246	553.8	0.22	2.05	✓	83	98	90	3.8		64
B6	48 / 1249	556.0	0.22	2.05	✓	83	98	90	3.8		64
B7	51 / 1252	558.3	0.215	2.0	✓	83	99	91	3.8		63
B8	54 / 1255	560.6	0.22	2.05	✓	84	99	92	4.0		64
B9	57 / 1258	562.8	0.19	1.80	✓	83	99	91	3.5		65
B10	60 / 1301	565.093		STOP - END OF TEST							
	/										
	/ $\bar{V}_m$ = 45.306			2.0	15	542.7	$\bar{T}_m$ = 550				
	/										

FIELD DATA

Plant SIZE CONTROL - LA PUENTE, CA.
Date 11-6-87
Sampling Location TANK 1 INLET
Sample Type CARB METHOD 425 CHROME
Run Number HOMI-7
Operator SIMON
Ambient Temperature 75°F Sunny
Barometric Pressure 30.12
Static Pressure (P_s) -0.54
Filter Number(s) HOMI-7F
Pretest Leak Rate = 0.010 cfm @ 15.0 in. Hg
Pretest Pitot Leak Check O.K.
Pretest Orsat Leak Check Not Applicable
Read and Record all Data Every 3 Minutes

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type 18" glass-lined SS
Pitot Tube I.D. No. S-4A
Nozzle I.D. 14p d=0.300
Assumed Moisture, % 2.0

Meter Box Number 1A
Meter $\Delta H_@$ 1.547
C Factor 1.15
Meter Gamma 1.011

Reference Δp 0.195
Post Test Leak Rate = 0.011 cfm @ 15.5 in. Hg
Post Test Pitot Leak Check O.K.
Post Test Orsat Leak Check Not Applicable
Impinger Box No. 1B
Blank = 3B

H6 conc = 35.1 oz/gal Cr^{+6} and 0.26 oz/gal SO_4^{2-}

Traverse Point Number	Sampling Time, (min)	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Orifice Pres. Differential (ΔH) in. H_2O Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Dry Gas Meter Temp. Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0	0938	285.345	0.23	2.15	✓	70	70	69	4.5		53
A1	3	1002	287.8	0.19	1.85	✓	71	70	69	4.0		48
A2	6	1005	289.8	0.20	1.90	✓	71	73	69	4.0		52
A3	9	1008	291.9	0.21	1.95	✓	70	75	70	4.0		56
A4	12	1011	294.1	0.20	1.90	✓	69	77	71	4.2		57
A5	15	1014	296.0	0.24	2.25	✓	70	78	71	4.5		54
A6	18	1017	298.5	0.26	2.45	✓	72	80	72	5.0		51
A7	21	1020	300.5	0.26	2.45	✓	71	81	73	5.0		60
A8	24	1023	303.1	0.25	2.35	✓	71	83	73	5.0		61
A9	27	1026	305.7	0.24	2.25	✓	70	84	75	4.5		61
A10	30	1029	308.016	0.19	1.85	✓	72	77	75	4.5		61
B1	33	1032	311.2	0.23	2.15	✓	73	83	76	4.0		55
B2	36	1035	313.4	0.22	2.05	✓	73	84	76	4.0		60
B3	39	1038	315.8	0.21	1.95	✓	72	86	77	4.0		60
B4	42	1041	318.0	0.22	2.05	✓	72	86	77	4.0		61
B5	45	1050	320.2	0.23	2.15	✓	73	87	78	4.0		61
B6	48	1053	322.5	0.23	2.15	✓	72	88	78	4.0		61
B7	51	1056	324.9	0.24	2.25	✓	71	88	79	4.5		62
B8	54	1059	327.2	0.22	2.05	✓	72	89	79	4.0		62
B9	57	1102	329.4	0.21	1.95	✓	72	89	80	4.0		61
B10	60	1105	331.598	—	STOP - END OF TEST							

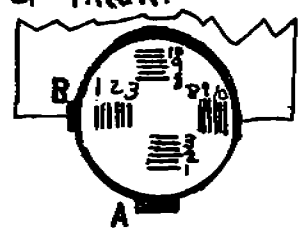
SWITCH START AT 1035

PACIFIC ENVIRONMENTAL SERVICES, INC.

FIELD DATA

Plant SIZE CONTROL - LA PUENTE, CA.
Date 11-6-89
Sampling Location TANK 1 INLET
Sample Type CARB METHOD 425 CHROME
Run Number HOMZ-8
Operator SIMON / PARKS
Ambient Temperature 75°F
Barometric Pressure 30.12
Static Pressure (P_s) -0.53" H_2O
Filter Number(s) HOMZ-8F
Pretest Leak Rate = 0.012 cfm @ 15.0 in. Hg
Pretest Pitot Leak Check 0.K
Pretest Orsat Leak Check Not Applicable
Read and Record all Data Every 3 Minutes

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type 18" glass-lined SS
Pitot Tube I.D. No. S-1A
Nozzle I.D. 03P 0.249" I.D
Assumed Moisture, % 23

Meter Box Number 1A
Meter $\Delta H_@$ 1.846
C Factor ~~1.04~~ 1.15
Meter Gamma 1.011

Reference Δp 0.195
Post Test Leak Rate = 0.00 cfm @ 16.0 in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check Not Applicable
Impinger Box No. 4B

Traverse Point Number	Sampling Time, (min) /	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0	1326	331.914	0.33	3.15	✓	81	80	77	5.5		54
A1	3	1329	334.8	0.21	2.00	2.3	75	79	77	3.0	(took picture of tank) #10	55
A2	6	1332	DIDN'T SEE	0.20	1.90	✓	76	80	77	3.5		55
A3	9	1335	339.7	0.22	2.10	✓	74	82	77	4.0		56
A4	12	~~1340~~ 1338	341.8	0.20	1.90	✓	75	83	77	3.5		56
A5	15	1341	344.1	0.20	1.90	✓	75	84	78	4.0		57
A6	18	1344	346.3	0.24	2.20	✓	76	86	79	4.1		57
A7	21	1347	348.5	0.25	2.35	✓	76	87	80	4.5		58
A8	24	1350	350.9	0.25	2.35	✓	74	86	80	4.5		58
A9	27	1353	353.6	0.23	2.15	✓	74	89	81	4.3		58
A10	30	1356	355.773	0.24	2.25	✓	78	85	78	4.5	(Took picture of tank) #11	62
B1	33	1405	358.4	0.24	2.25	✓	76	89	82	4.0		56
B2	36	1408	360.8	0.22	2.10	✓	76	90	82	4.0		57
B3	39	1411	363.2	0.22	2.10	✓	76	92	83	4.50		59
B4	42	1414	365.7	0.21	2.00	✓	76	92	84	4.0		60
B5	45	1417	368.1	0.21	2.00	✓	77	92	84	3.5		60
B6	48	1420	370.1	0.23	2.15	✓	76	92	84	4.0		60
B7	51	1423	372.3	0.22	2.10	✓	77	93	84	4.0		61
B8	54	1426	374.9	0.23	2.15	✓	76	93	85	4.0		61
B9	57	1429	377.0	0.19	1.85	✓	77	93	85	3.0		61
B10	60	1432	379.115	—	STOP-END OF TEST		—				(Took picture of tank) #12	

SWITCH START AT 1402

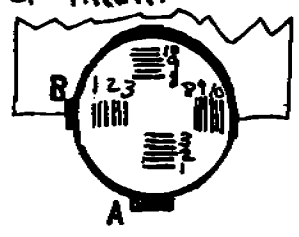
PACIFIC ENVIRONMENTAL SERVICES, INC.

PACIFIC ENVIRONMENTAL SERVICES, INC.

FIELD DATA

Plant: SIZE CONTROL - LA PUENTE, CA.
Date: 11-8-89
Sampling Location: TANK 1 INLET
Sample Type: CARB METHOD 425 CHROME
Run Number: HOMI-11
Operator: SIMON
Ambient Temperature: 80°F sunny
Barometric Pressure: 30.04 "Hg
Static Pressure (P_s): -0.54" H_2O
Filter Number(s): HOMI-11F
Pretest Leak Rate = 0.01 cfm @ 15.0 in. Hg
Pretest Pitot Leak Check: OK
Pretest Orsat Leak Check: Not Applicable
Read and Record all Data Every 3 Minutes

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type: 18" glass-lined SS
Pitot Tube I.D. No.: S-1A
Nozzle I.D.: 0.31 d=0.299"
Assumed Moisture, %: 2.0

Meter Box Number: 1A
Meter $\Delta H_@$: 1.876
C Factor: 1.15
Meter Gamma: 1.011

Reference Δp: 0.195
Post Test Leak Rate = 0.011 cfm @ 15 in. Hg
Post Test Pitot Leak Check: OK
Post Test Orsat Leak Check: Not Applicable
Impinger Box No.: 4B
BLANK = BOX 2B

Traverse Point Number	Sampling Time, (min)	/ Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0	1002	474.722	0.25	2.40	✓	72	68	66	4.5		55
A1	3	1005	476.7	0.21	2.00	✓	74	70	67	4.0		42
A2	6	1008	478.9	0.19	1.80	✓	73	73	67	3.5		42
A3	9	1011	481.0	0.20	1.90	✓	73	75	68	3.5		45
A4	12	1014	483.1	0.20	1.90	✓	73	77	69	3.5		48
A5	15	1017	485.2	0.22	2.10	✓	74	79	70	4.0		50
A6	18	1020	487.5	0.23	2.15	✓	74	81	71	4.0		52
A7	21	1023	489.8	0.25	2.35	✓	74	81	72	4.5		52
A8	24	1026	492.2	0.26	2.45	✓	74	82	73	4.5		54
A9	27	1029	494.7	0.24	2.25	✓	74	84	73	4.0		54
A10	30	1032	497.05	0.29	2.75	✓	75	79	75	5.0		55
SWITCH START AT 1036 → B1	33	1035	499.7	0.20	1.90	✓	77	85	76	4.0		52
B2	36	1042	502.0	0.20	1.90	✓	76	86	76	4.0		54
B3	39	1045	504.0	0.20	1.90	✓	76	87	78	4.0		55
B4	42	1048	506.3	0.21	2.00	✓	77	87	78	4.0		56
B5	45	1051	508.5	0.21	2.00	✓	76	88	79	4.0		56
B6	48	1054	510.8	0.22	2.10	✓	77	89	79	4.0		57
B7	51	1057	512.9	0.23	2.15	✓	78	90	80	4.0		56
B8	54	1100	515.4	0.22	2.10	✓	78	90	80	4.0		56
B9	57	1103	517.9	0.20	1.90	✓	78	90	81	3.5		56
B10	60	1106	—	—	STOP - END OF TEST —				—			
		/	519.663									
		/										
		/										

PACIFIC ENVIRONMENTAL SERVICES, INC.

Description of Impinger Catch:

PACIFIC ENVIRONMENTAL SERVICES, INC.

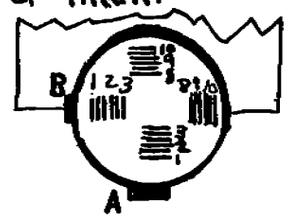
PACIFIC ENVIRONMENTAL SERVICES, INC.

PACIFIC ENVIRONMENTAL SERVICES, INC.

FIELD DATA

Plant SIZE CONTROL - LA PUENTE, CA.
Date 11-8-89
Sampling Location TANK 1 INLET
Sample Type CARB METHOD 425 CHROME
Run Number HCMI - 12
Operator PARKS
Ambient Temperature 80° F
Barometric Pressure 30.04
Static Pressure (P_s) -0.54" H_2O
Filter Number(s) HCMI-12F
Pretest Leak Rate = 0.006 cfm @ 15" in. Hg
Pretest Pitot Leak Check
Pretest Orsat Leak Check Not Applicable
Read and Record all Data Every 3 Minutes

TOP VIEW - FLOW IS OUT OF PAPER.



Schematic of Traverse Point Layout

Probe Length and Type 18" glass-lined SS
Pitot Tube I.D. No. 5-1A
Nozzle I.D. 04P 0.300" I.D.
Assumed Moisture, % 3%

Meter Box Number 1A
Meter $\Delta H_@$ 1.846
C Factor 1.15
Meter Gamma 1.011

Reference Δp 0.195
Post Test Leak Rate = 0.00 cfm @ 15 in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check Not Applicable
Impinger Box No. 1A

Traverse Point Number	Sampling Time, (min) / Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (ΔP_s) in. H_2O	Orifice Pres. Differential (ΔH) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg		Impinger Temp. °F
A1	0 / 1158	519.787	0.24	2.25	✓	82	83	81	4.0		57
A1	3 / 1201	522.3	0.20	1.90	✓	81	84	82	4.0		61
A2	6 / 1204	524.9	0.17	1.60	✓	81	86	82	3.0		56
A3	9 / 1207	526.5	0.20	1.90	✓	82	88	82	3.4		59
A4	12 / 1210	528.7	0.19	1.80	✓	82	89	83	3.4		61
A5	15 / 1213	530.8	0.23	2.15	✓	83	91	84	3.8		63
A6	18 / 1216	533.0	0.23	2.15	✓	83	92	84	3.8		62
A7	21 / 1219	535.9	0.23	2.15	✓	83	93	85	3.8		63
A8	24 / 1222	537.7	0.20	1.90	✓	84	94	86	3.8		63
A9	27 / 1225	540.0	0.20	1.90	✓	83	95	86	3.5		63
A10	30 / 1228	542.176	0.23	2.15	✓	84	94	87	3.8		62
SWITCH START AT 1231 → B1	33 / 1234	544.5	0.20	2.05	✓	82	96	88	3.8		62
B2	36 / 1237	546.9	0.23	2.15	✓	83	97	88	3.8		63
B3	39 / 1240	549.2	0.22	2.05	✓	82	97	89	3.8		63
B4	42 / 1243	551.4	0.20	1.9	✓	83	98	89	3.8		64
B5	45 / 1246	553.8	0.22	2.05	✓	83	98	90	3.8		64
B6	48 / 1249	556.0	0.22	2.05	✓	83	98	90	3.8		64
B7	51 / 1252	558.3	0.215	2.0	✓	83	99	91	3.8		63
B8	54 / 1255	560.6	0.22	2.05	✓	84	99	92	4.0		64
B9	57 / 1258	562.8	0.19	1.86	✓	83	99	92	3.5		65
B10	60 / 1301	565.093		STOP - END OF TEST							
	/										
	/										
	/										

PES

SAMPLE RECOVERY DATA

Plant: Size Control — OMI TESTS

Date: 11/1/89

Sampling Location: Tank # - Uncontrolled = 1600 A

Sample Type: CHROME

Run Number: ~~HOUR 4~~ LIMITED

Sample Box Number: 2B

Clean-up Man: PARKS

Job Number: 3921

Comments:

FRONT HALF

Filter Number: _____ _____ _____

Description of Filter:

MOISTURE

Impingers			
Final Volume:	200 ml	200 ml	ml
Initial Volume:	100 ml	100 ml	ml
Net Volume:	ml	ml	ml
Total H_2O:			
Silica Gel			
Final Volume:	608.8 g	g	g
Initial Volume	610.0 g	g	g
Net Volume	g	g	g
Total Moisture:			

Description of Impinger Catch:

PES

SAMPLE RECOVERY DATA

Plant: SIZE CONTROL PLATING CO. - LA PUENTE, CA.

Date:

Sampling Location: TANK 1 INLET DUCT

Sample Type: CARB METHOD 425 - Chrome

Run Number: H[illegible]

Sample Box Number: 48

Clean-up Man: SIMON/PARKS

Job Number: 3921

Comments:

FRONT HALF

Filter Number: | | |

Description of Filter:

MOISTURE

Impingers

Final Volume:	96 ml	100 ml	ml
Initial Volume:	[illegible] ml	ml	ml
Net Volume:	ml	ml	ml
Total H_2O:	-4		

Silica Gel

Final Volume:	[illegible] g	g	g
Initial Volume	155.1 g	g	g
Net Volume	g	g	g
Total Moisture:	0.1		0.1

Description of Impinger Catch:

PES

SAMPLE RECOVERY DATA

Plant: SIZE CONTROL PLATING Co. - LA PUENTE, CA.

Date: 11-1-

Sampling Location: TANK 1 INLET DUCT

Sample Type: CARB METHOD 425 - Chrome

Run Number: 6/8/91 - 4

Sample Box Number: 3B

Clean-up Man: SIMON/PARKS

Job Number: 3921

Comments:

FRONT HALF

Filter Number:

Description of Filter:

MOISTURE

Impingers

Final Volume:	98 ml	102 ml	ml
Initial Volume:	100 ml	100 ml	ml
Net Volume:	9 ml	ml	ml
Total H_2O:	0		

Silica Gel

Final Volume:	g	g	g
Initial Volume	g	g	g
Net Volume	g	g	g
Total Moisture:			98

Description of Impinger Catch:

PES

SAMPLE RECOVERY DATA

Plant: SIZE CONTROL PLATING CO. - LA PUENTE, CA.

Date: 11-2-[illegible]

Sampling Location: TANK 1 INLET DUCT

Sample Type: CARB METHOD 425 - Chrome

Run Number: HMT-5

Sample Box Number: 1B

Clean-up Man: SIMONI/PARKS

Job Number: 3921

Comments:

FRONT HALF

Filter Number: _____ _____ _____

Description of Filter: _____

MOISTURE

Impingers

Final Volume:	106 ml	100 ml	1 ml
Initial Volume:	100 ml	100 ml	0 ml
Net Volume:	[illegible] ml	[illegible] ml	1 ml
Total H_2O:	17		

Silica Gel

Final Volume:	1170 g	g	g
Initial Volume	606.4 g	g	g
Net Volume	16.6 g	g	g
Total Moisture:			

Description of Impinger Catch: [illegible]

SAMPLE RECOVERY DATA

Plant: SIZE CONTROL PLATING CO. - LA PUENTE, CA.

Date: 11/2/89

Sampling Location: TANK 1 INLET DUCT

Sample Type: CARB METHOD 425 - Chrome

Run Number: HCMI-6

Sample Box Number: 4B

Clean-up Man: SIMON/PARKS

Job Number: 3921

Comments:

FRONT HALF

Filter Number:

Description of Filter:

MOISTURE

Impingers			
Final Volume:	296 ml	100 ml	ml
Initial Volume:	100 ml	100 ml	ml
Net Volume:	ml	ml	ml
Total H_2O:	(-4)		
Silica Gel			
Final Volume:	657.9 g	g	g
Initial Volume	647.2 g	g	g
Net Volume	10.7 g	g	g
Total Moisture:			6.7

Description of Impinger Catch:

PES

SAMPLE RECOVERY DATA

Plant: SIZE CONTROL PLATING CO. - LA PUENTE, CA.

Date: 11-2-89

Sampling Location: TANK 1 INLET DUCT

Sample Type: CARB METHOD 425 - Chrome

Run Number: 2B

Sample Box Number:

Clean-up Man: SIMONI/PARKS

Job Number: 3921

Comments:

FRONT HALF

Filter Number:

Description of Filter:

MOISTURE

Impingers

Final Volume:	100 ml	[illegible] ml	ml
Initial Volume:	100 ml	100 ml	0 ml
Net Volume:	ml	ml	ml
Total H_2O:	0		

Silica Gel

Final Volume:	616.1 g	g	g
Initial Volume	615.9 g	g	g
Net Volume	[illegible] g	g	g
Total Moisture:			

Description of Impinger Catch:

PES

SAMPLE RECOVERY DATA

Plant: SIZE CONTROL PLATING CO. - LA PUENTE, CA.

Date:

Sampling Location: TANK 1 INLET DUCT

Sample Type: CARB METHOD 425 - Chrome

Run Number: HCMT-7

Sample Box Number: 1B

Clean-up Man: SIMONI/PARKS

Job Number: 3921

Comments:

FRONT HALF

Filter Number:

Description of Filter:

MOISTURE

Impingers

Final Volume:	100 ml	104 ml	0 ml
Initial Volume:	100 ml	100 ml	0 ml
Net Volume:	ml	ml	ml
Total H_2O:	4		

Silica Gel

Final Volume:	646.9 g	g	g
Initial Volume	[illegible] g	g	g
Net Volume	10.7 g	g	g
Total Moisture:			14.7

Description of Impinger Catch:

PES

SAMPLE RECOVERY DATA

Plant: SIZE CONTROL PLATING CO. - LA PUENTE, CA.

Date:

Sampling Location: TANK 1 INLET DUCT

Sample Type: CARB METHOD 425 - Chrome

Run Number: 4R HOMI-8

Sample Box Number: 4R

Clean-up Man: SIMON/PARKS

Job Number: 3921

Comments:

FRONT HALF

Filter Number:

Description of Filter:

MOISTURE

Impingers			
Final Volume:	101 ml	106 ml	4 ml
Initial Volume:	[illegible] ml	[illegible] ml	0 ml
Net Volume:	ml	ml	ml
Total H_2O:			20
Silica Gel			
Final Volume:	646.7 g	g	g
Initial Volume	636.3 g	g	g
Net Volume	10.4 g	g	10.4 g
Total Moisture:			

Description of Impinger Catch:

PES

SAMPLE RECOVERY DATA

Plant: SIZE CONTROL PLATING CO. - LA PUENTE, CA.

Date: [illegible]

Sampling Location: TANK 1 INLET DUCT

Sample Type: CARB METHOD 425 - Chrome

Run Number: HOMI-6TB

Sample Box Number: [illegible]

Clean-up Man: SIMONI/PARKS

Job Number: 3921

Comments:

FRONT HALF

Filter Number: _____ _____ _____

Description of Filter:

MOISTURE

Impingers

Final Volume:	100 ml	100 ml	ml
Initial Volume:	ml	[illegible] ml	ml
Net Volume:	ml	ml	ml
Total H_2O:			0

Silica Gel

Final Volume:	629.5 g	g	g
Initial Volume	[illegible] g	g	g
Net Volume	0.3 g	g	g
Total Moisture:			

Description of Impinger Catch:

PES

SAMPLE RECOVERY DATA

Plant: SIZE CONTROL PLATING CO. - LA PUENTE, CA.

Date: 11-7

Sampling Location: TANK 1 INLET DUCT

Sample Type: CARB METHOD 425 - Chrome

Run Number: 1GMT-9

Sample Box Number: [illegible]

Clean-up Man: SIMON/PARKS

Job Number: 3921

Comments:

FRONT HALF

Filter Number: 1GMT-9F

Description of Filter:

MOISTURE

Impingers			
Final Volume:	110 ml	114 ml	ml
Initial Volume:	100 ml	100 ml	ml
Net Volume:	ml	ml	ml
Total H_2O:		14	
Silica Gel			
Final Volume:	71 g	g	g
Initial Volume	[illegible] g	g	g
Net Volume	129 g	g	g
Total Moisture:			129

Description of Impinger Catch:

PES

SAMPLE RECOVERY DATA

Plant: SIZE CONTROL PLATING Co. - LA PUENTE, CA.

Date: 11-7-89

Sampling Location: TANK 1 INLET DUCT

Sample Type: CARB METHOD 425 - Chrome

Run Number:

Sample Box Number:

Clean-up Man: SIMON/PARKS

Job Number: 3921

Comments:

FRONT HALF

Filter Number: _____ _____ _____

Description of Filter:

MOISTURE

Impingers

Final Volume:	ml	ml	ml
Initial Volume:	ml	ml	ml
Net Volume:	ml	ml	ml
Total H_2O:			

Silica Gel

Final Volume:	g	g	g
Initial Volume	g	g	g
Net Volume	g	g	g
Total Moisture:			

Description of Impinger Catch:

PES

SAMPLE RECOVERY DATA

Plant: SIZE CONTROL PLATING Co. - LA PUENTE, CA.

Date: 11-7-88

Sampling Location: TANK 1 INLET DUCT

Sample Type: CARB METHOD 425 - Chrome

Run Number: HCUI-7TB

Sample Box Number: 28

Clean-up Man: SIMON/PARKS

Job Number: 3921

Comments: water splash [illegible] with water [illegible] may [illegible] some contamination

FRONT HALF

Filter Number: _____ _____ _____

Description of Filter: _____

MOISTURE

Impingers

Final Volume:	____ ml	____ ml	____ ml
Initial Volume:	____ ml	____ ml	____ ml
Net Volume:	____ ml	____ ml	____ ml
Total H_2O:	____	____	____

Silica Gel

Final Volume:	____ g	____ g	____ g
Initial Volume	[illegible] g	____ g	____ g
Net Volume	____ g	____ g	____ g
Total Moisture:	____	____	____

Description of Impinger Catch: _____

PES

SAMPLE RECOVERY DATA

Plant: SIZE CONTROL PLATING Co. - LA PUENTE, CA.

Date: [illegible]

Sampling Location: TANK 1 INLET DUCT

Sample Type: CARB METHOD 425 - Chrome

Run Number: HAMI - 11

Sample Box Number: 4B

Clean-up Man: SIMON/PARKS

Job Number: 3921

Comments:

FRONT HALF

Filter Number: HAMI-11F

Description of Filter:

MOISTURE

Impingers			
Final Volume:	109 ml	100 ml	ml
Initial Volume:	100 ml	100 ml	0 ml
Net Volume:	ml	ml	ml
Total H_2O:	(4)		(4)
Silica Gel			
Final Volume:	636.0 g	g	g
Initial Volume	[illegible] g	g	g
Net Volume	(7.6) g	g	(11.6) g
Total Moisture:			

Description of Impinger Catch:

PES

SAMPLE RECOVERY DATA

Plant: SIZE CONTROL PLATING CO. - LA PUENTE, CA.

Date: 1-8-87

Sampling Location: TANK 1 INLET DUCT

Sample Type: CARB METHOD 425 - Chrome

Run Number: 110.MI-12

Sample Box Number: 1B

Clean-up Man: SIMONI/PARKS

Job Number: 3921

Comments:

FRONT HALF

Filter Number: 110MI-12F

Description of Filter:

MOISTURE

Impingers

Final Volume:	[illegible] ml	ml	ml
Initial Volume:	100 ml	100 ml	0 ml
Net Volume:	~~[illegible]~~ ml	-2 ml	ml
Total H_2O:			

Silica Gel

Final Volume:	634.1 g	g	g
Initial Volume	622.4 g	g	g
Net Volume	12.5 g	g	~~10~~ g
Total Moisture:			10.5

Description of Impinger Catch:

PES

SAMPLE RECOVERY DATA

Plant: SIZE CONTROL PLATING CO. - LA PUENTE, CA.

Date: 11-8-89

Sampling Location: TANK 1 INLET DUCT

Sample Type: CARB METHOD 425 - Chrome

Run Number: HONI-8-TB

Sample Box Number: 2B

Clean-up Man: SIMON/PARKS

Job Number: 3921

Comments:

FRONT HALF

Filter Number: HONI-8FB

Description of Filter:

MOISTURE

Impingers			
Final Volume:	100 ml	101 ml	ml
Initial Volume:	100 ml	101 ml	0 ml
Net Volume:	0 ml	ml	ml
Total H_2O:	0	0	0
Silica Gel			
Final Volume:	599.3 g	g	g
Initial Volume	599.3 g	g	g
Net Volume	0 g	g	g
Total Moisture:			

Description of Impinger Catch: 0

SURFACE AREA = 12.915 ft²

2.583' x 5" = 12.915 ft²

H2O : LOAM LOK
2 : 1

DATE	TIME	TEMP	VOLT	AMPS	ADDITION	FOAM	COMMENT
11-6-89	8:45	128°F	5V	800A	43 cc (129 cc DILUTED)	HIGH	
11-6-89	9:00	128°F	5V	800A	43 cc (129 cc DILUTED)	HIGH	
11-6-89	10:00	131°F	5V	800A	43 cc TEST	GOOD	
11-6-89	12:15	132°F	5V	800A	43 cc	GOOD	
11-6-89	1:15	132°F	5V	800A	43 cc TEST	—	
11-7-89	4:30	131°F	6V	1500A	43 cc	GOOD	100% COVERAGE AFTER 5 MIN
11-7-89	9:55	130°F	6V	1650A	(TEST) 43 cc	HEAVY THICK	AROUND ELECTRODES
11-7-89	10:45	130°F	6V	1650	43 cc	" "	"
11-7-89	1:45	131°F	6	1675	43 cc TEST	"	"
11-8-89	9:30	131°F		2435	43 cc		TWO RECTIFIE
11-8-89	9:55	131°F		2435	43 cc (TEST)		"
11-8-89	10:20	134°F		2435	43 cc		"
11-8-89	11:55	134°F		2350	43 cc TEST		
11-8-89	12:30	134°F		2350	43 cc		

CHROME PLATING OR ANODIZING PROCESS DATA

PLATING SHOP: SIZE CONTROL
TEST DATE: 10-31-89
TEST NUMBER: HOMI-1 w/ HOMI-2
TANK NUMBER: 1
LENGTH: 50"
WIDTH: 31"
DEPTH: 48"
FREEBOARD: 6"
HOOD TYPE: SLOT BOTH SIDES
POLLYBALLS: NONE SIZE: — PERCENT COVERAGE: —
ADDITIVE: NONE MANUFACTURER: — PRODUCT: —
AGITATION AIR: NONE
ACID STRENGTH: 33 oz/gal
BATH TEMP: 130°F
CONTROL EQUIPMENT: Scrubber after sampling location

RECTIFIER NO. 17 RECTIFIER NO. —

TIME	VOLTS	AMPS	AMP-HOURS	VOLTS	AMPS	AMP-HOURS
	START	HOMI-1				
1021	5.0	800	6428799			
1027	5.0	800	6428919			
1035	5.0	800	6429016			
1039	5.0	800	6429074			
1051	5.0	800	6429235			
1055	5.0	800	6429292		Ā =	453
1100	5.0	800	6429358			
1108	5.0	800	6429473			
1115	5.0	800	6429563			
1125	5.0	800	6429709			
	END	OF HOMI-1				
	START	HOMI-2				
1212	5.0	825	6430360			
1220	5.0	825	6430474			
1233	5.0	825	6430653			
1242	5.0	800	6430781		Ā =	839
1245	5.0	800	6430811			
1255	5.0	800	6430961			
1305	5.0	800	6431095			
1315	5.0	800	6431235			
	END	HOMI-2				

CHROME PLATING OR ANODIZING PROCESS DATA

PLATING SHOP: SIZE CONTROL
TEST DATE: 11-1-88
TEST NUMBER: HOMI-3 and HOMI-4
TANK NUMBER: 1
LENGTH: 59"
WIDTH: 31"
DEPTH: 48"
FREEBOARD: 6"
HOOD TYPE: 3 Side ISOTA SIDES
POLLYBALLS: NONE SIZE _____ PERCENT COVERAGE _____
ADDITIVE: NONE MANUFACTURER _____ PRODUCT _____
AGITATION AIR: NONE
ACID STRENGTH: 33 oz/gallon
BATH TEMP: 131°F and 133°F
CONTROL EQUIPMENT: Scrubber after sampling ports.

RECTIFIER NO. 17 RECTIFIER NO. —

TIME	VOLTS	AMPS	AMP-HOURS	VOLTS	AMPS	AMP-HOURS
	START HOMI-3					
1010	5.75	1600	6433054			
1018	5.75	1575	6433259			
1026	5.75	1550	6433470			
1033	5.75	1550	6433653			
1045	5.75	1525	6433836	A=	1644	
1045	5.75	1550	6433949			
1052	5.75	1550	6434150			
1102	5.75	1550	6434417			
1107	5.75	1550	6434655			
1115	5.75	1550	6434770			
	END HOMI-3					
	START HOMI-4					
1208	6.0	1575	6436162			
1218	6.0	1575	6436443			
1227	6.0	1575	6436691			
1240	6.0	1575	6436995	A=	1645	
1241	6.0	1575	6437070			
1251	6.0	1575	6437350		ϕ	
1301	6.0	1575	6437606			
1311	6.0	1575	6437881			

PES

CHROME PLATING OR ANODIZING PROCESS DATA

PLATING SHOP: SIZE CONTROL - LA PUENTE
TEST DATE: 11-2-89
TEST NUMBER: HOMI-5 and HOMI-6
TANK NUMBER: 1
LENGTH: 59"
WIDTH: 31
DEPTH: 48
FREEBOARD: 6"
HOOD TYPE: 1½" SLOT BOTH SIDES
POLLYBALLS: NONE SIZE: — PERCENT COVERAGE: —
ADDITIVE: NONE MANUFACTURER: — PRODUCT: —
AGITATION AIR: NONE
ACID STRENGTH: 33 oz/gal
BATH TEMP: 131°F and 134° starting temp (≈ constant)
CONTROL EQUIPMENT: Scrubber After Sampling Port

RECTIFIER NO. 16 RECTIFIER NO. 17

TIME	VOLTS	AMPS	AMP-HOURS	VOLTS	AMPS	AMP-HOURS
	START	HOMI-5				
1018	6.0	~~1200~~ 1275	4864059	4.5 5.5	1225	6439102
1023	6.0	1325	4864174	5.5	1225	6439 [illegible]
1035	5.8	1300	4864454	5.5	1250	6439456
1044	5.5	1200	4864631	5.5	1250	6439639
1048	5.6	1200	4864731	5.5	1225	6439755
1052	5.6	1200	4864807	5.5	1225	6439819
1100	5.5	1200	4864961	5.5	1225	6439977
1109	5.5	1200	4865148	5.5	1225	6440178
1115	5.5	1200	4865296	5.5	1225	6440310
1120	5.5	1200	4865437	5.5	[illegible]	6440463
	END	HOMI-5				
	START	HOMI-6				
1206	5.5	1200	4866320	5.5	1200	6441355
1216	5.5	[illegible]	4866543	5.5	1200	6441547
1226	5.5	1200	4866709	5.5	1200	6441778
1236	5.5	1200	4866852	5.5	1200	6441[illegible]
1248	5.5	[illegible]	4866968	5.5	[illegible]	[illegible]
1258	5.5	1200	4867306	5.5	1200	6442247
1308	5.5	1200	4867400	5.5	1200	6442450
	5.5	1200	4867600	5.5	1200	6442666

A = 2560

A = 2500

CHROME PLATING OR ANODIZING PROCESS DATA

PLATING SHOP: SIZE CONTROL
TEST DATE: 11-6-89
TEST NUMBER: HOMI-7 and HOMI-8
TANK NUMBER: 1
LENGTH: 59"
WIDTH: 31"
DEPTH: 48"
FREEBOARD: 6" to top of Fumes
HOOD TYPE: Slot Both Sides
POLLYBALLS: Yes SIZE: 1" dia PERCENT COVERAGE: 100
ADDITIVE: Foamlock L MANUFACTURER: OMI PRODUCT:
AGITATION AIR: No
ACID STRENGTH: 33 oz/gal
BATH TEMP: 133°F and 131°F respectively
CONTROL EQUIPMENT: Scrubber after sampling port

RECTIFIER NO. 17 RECTIFIER NO. —

TIME	VOLTS	AMPS	AMP-HOURS	VOLTS	AMPS	AMP-HOURS
	START HOMI-7					
~~0938~~	~~5.0~~	~~850~~	~~646837~~			
0959	5.0	850	646891			
1009	5.0	850	646848			
1018	5.0	840	646877			
1033	5.0	850	646986			
1042	5.0	840	646932			
1049	5.0	840	646738 3			
1054	5.0	840	646967			
1104	5.0	840	646965			
	END HOMI-87					
	START HOMI-8					
1326	5.0	840	647160			
1336	5.0	830	647250			
1346	5.0	840	647349			
1356	5.0	840	647204			
1400	5.0	840	647210			
~~1402~~ 1412	5.0	840	647227			
1421	5.0	840	647240			
1432	5.0	840	647254			
	END HOMI-8					

PES

CHROME PLATING OR ANODIZING PROCESS DATA

PLATING SHOP: SIZE CONTROL
TEST DATE: 11-7-87
TEST NUMBER: HOMI-9 and HOMI-10
TANK NUMBER: 1
LENGTH: 59"
WIDTH: 31"
DEPTH: 48"
FREEBOARD: 6"
HOOD TYPE: Slot Both Sides
POLLYBALLS: Yes — SIZE: 1" dia. — PERCENT COVERAGE: 100
ADDITIVE: Yes — MANUFACTURER: DMI — PRODUCT: Foamlock L
AGITATION AIR: No
ACID STRENGTH: 33 oz/gal
BATH TEMP: 130° - 132° first test, 131 entire 2nd test
CONTROL EQUIPMENT: Scrubber after Sampling POTS

RECTIFIER NO. 17 — RECTIFIER NO. —

TIME	VOLTS	AMPS	AMP-HOURS	VOLTS	AMPS	AMP-HOURS
	START HOMI-9					
1013	6.25	1650	6475503			
1022	6.25	1625	6475575			
1034	6.25	1650	6476078			
1039	6.25	1650	6476256			
1045	6.25	1650	6476420			
1054	6.25	1650	6476638	← NOTE: WORKER DUMPED WATER ON		
1104	6.25	1700	6476971	SWITCHING PLATES		
1112	6.25	1725	6477146			
1116	6.25	1725	6477240			
		END HOMI-9				
		START HOMI-10				
1248	6.25	1700	6479722			
1255	6.25	1700	6479918			
1302	6.25	1700	6480129			
1313	6.25	1700	6480443			
1319	6.25	1700	6480608			
1325	6.25	1700	6480810			
1336	6.25	1700	6481149			
1345	6.25	1725	6481386			
1348	6.25	1700	6481460			
1351	6.25	1725	6481565			
		END HOMI-10				

CHROME PLATING OR ANODIZING PROCESS DATA

PLATING SHOP: SIZE CONTROL
TEST DATE: 11-8-89
TEST NUMBER: HOMI-11 and HOMI-12
TANK NUMBER: I
LENGTH: 59"
WIDTH: 31"
DEPTH: 48"
FREEBOARD: 6"
HOOD TYPE: Slot Both Sides
POLLYBALLS: Yes SIZE 1" PERCENT COVERAGE 100
ADDITIVE: yes MANUFACTURER OMI PRODUCT Fume Lock II
AGITATION AIR: NO
ACID STRENGTH: 32 oz/gal
BATH TEMP: 130°F - 135°F and
CONTROL EQUIPMENT: Scrubber After Sampling Ports

RECTIFIER NO. 16 RECTIFIER NO. 17

TIME	VOLTS	AMPS	AMP-HOURS	VOLTS	AMPS	AMP-HOURS
	START	HOMI-11				
1004	5.8	1325	4977187	5.5	1175	6483726
1010	5.8	1300	4972337	5.5	1150	6483893
1019	5.5	1300	4972603	5.5	1150	6484076
1029	5.9	1350	4972799	5.5	1150	6484240
1036	5.9	1375	4972979	5.5	1150	6484359
1044	5.9	1350	4973165	5.5	1175	6484563
1052	5.9	1350	4973373	5.5	1175	6484729
1103	5.9	1350	4973627	5.5	1175	6484947
1101	5.9	1350	4973910	5.5	1175	6485219
		END	HOMI-11			
		START	HOMI-12			
1204	5.5	1175	4974848	5.5	1175	6486096
1212	5.5	1175	4975133	5.4	1150	6486319
1222	5.5	1175	4975323	5.5	1175	6486504
1229	5.4	1175	4975440	5.5	1175	6486617
1236	5.5	1175	4975613	5.4	1150	6486740
1248	5.5	1175	4975895	5.4	1150	6487017
1267	5.5	1175	4976130	5.4	1150	6487259

NOTE: LAST CALIBRATIONS on 9/22/89 for both rectifiers

Plant: SIZE Control
Date: 11-31-99
Source/Sample Number: HDMI-1

1. $V_{m(std)} = 17.64\ V_m\ Y \left[\frac{P_{bar} + (\Delta H/13.6)}{T_m}\right]$

$V_{m(std)} = 17.64(46.652)(1.011)\left[\frac{(29.95) + (.226/13.6)}{(542.8)}\right]$

$V_{m(std)}$ = 46.162 dscf

2. Volume Water Vapor Collected, Standard Conditions

V_{lc} = 2.7 condensate from impingers and Silica Gel

$V_{W(std)} = .04707\ V_{lc}$ = 0.127 scf

$V_{W(std)}$ = 0.127 scf

3. Percent Moisture, by volume

$B_{Ws} = \frac{V_{W(std)}}{V_{W\ std} + V_{m\ (std)}} = \frac{(0.127)}{(0.127)+(46.162)} = 0.003$

B_{Ws} = 0.3%

4. Molecular Weight, Stack gas

Dry Molecular Wight

$M_d = 0.440\ (\%\ CO_2) + 0.320\ (\%\ O_2) + 0.280\ (\%\ N_2 + \%\ CO)$

$M_d = 0.440(\quad) + 0.320(\quad) + 0.280(\quad)$

M_d = 29.0 lb/lb-mole

$M_s = M_d + B_{Ws}(18 - M_d) = (29.0) + (0.003)(18 - 29.0)$

M_s = 29.97 lb/lb-mole

Plant: STZE - Control
Date: 10-31-89
Source/Sample Number: HSWI-1

5. Stack Gas Velocity Average

$$V_{s(avg)} = 85.49\ C_p \left(\sqrt{\Delta P}\right)_{avg} \sqrt{\frac{T_s}{P_s M_s}}$$

$$V_{s(avg)} = 85.49(0.84)(0.4878)\sqrt{\frac{(538.6)}{(29.91)(28.97)}}$$

$V_{s(avg)}$ = 27.62 ft/sec.

6. Stack Volumetric Flow Rate, Actual Conditions (Stack Temperature and Pressure)

$$Q_s = 60\ V_s\ A = 60\ (27.62)(1.069)$$

Q_s = 1772 acfm

7. Stack volumetric flow rate, standard conditions (68° F, 29.92 Hg)

$$Q_{(std)} = 17.64\ Q_s\ (1-B_{ws})\ \frac{P_s}{T_s} =$$

$$Q_{(std)} = 17.64(1772)(1-0.003)\frac{(29.91)}{(538.6)}$$

Q_{std} = 1731 dscfm

8. Isokinetic Variation

$$\%I = K\ \frac{T_s\ V_{m(std)}}{P_s\ V_s\ A_n\ \theta\ (1-B_{ws})}$$

$$= 0.0945\ \frac{(538.6)(46.162)}{(29.91)(27.62)(0.00576)(60)(1-0.003)}$$

%I = 97.5 %

PES

Plant: DEC CONTROL
Date: 4-21-89
Source/Sample Number: HOMI-2

1. $V_{m(std)} = 17.64\ V_m\ Y \left[\frac{P_{bar} + (\Delta H/13.6)}{T_m}\right]$

$V_{m(std)} = 17.64(46.743)(1.011)\left[\frac{(29.95) + (2.1/13.6)}{(550.4)}\right]$

$V_{m(std)} =$ 45.595 dscf

2. Volume Water Vapor Collected, Standard Conditions

$V_{lc} =$ 3.6 condensate from impingers and Silica Gel

$V_{W(std)} = .04707\ V_{lc} =$ 0.169 scf

$V_{W(std)} =$ 0.169 scf

3. Percent Moisture, by volume

$B_{Ws} = \frac{V_{W(std)}}{V_{W\ std} + V_{m\ (std)}} = \frac{(0.169)}{(0.169)+(45.595)} =$ 0.004

$B_{Ws} =$ 0.43

4. Molecular Weight, Stack gas

Dry Molecular Wight

$M_d = 0.440\ (\%\ CO_2) + 0.320\ (\%\ O_2) + 0.280\ (\%\ N_2 + \%\ CO)$

$M_d = 0.440(\quad) + 0.320(\quad) + 0.280(\quad)$

$M_d =$ 29.0 lb/lb-mole

$M_s = M_d + B_{Ws}(18 - M_d) = (29.0) + (0.004)(18 - 29.0)$

$M_s =$ 28.96 lb/lb-mole

Plant: SCE Control
Date: 10-31-89
Source/Sample Number: HCMI-2

5. Stack Gas Velocity Average

$$V_{s(avg)} = 85.49\ C_p \left(\sqrt{\Delta P}\right)_{avg} \sqrt{\frac{T_s}{P_s M_s}}$$

$$V_{s(avg)} = 85.49(0.84)(0.4619)\sqrt{\frac{(542.5)}{(29.91)(28.96)}}$$

$V_{s(avg)}$ = 26.25 ft/sec.

6. Stack Volumetric Flow Rate, Actual Conditions (Stack Temperature and Pressure)

$$Q_s = 60\ V_s\ A = 60\ (26.25)(1.069)$$

Q_s = 1684 acfm

7. Stack volumetric flow rate, standard conditions (68° F, 29.92 Hg)

$$Q_{(std)} = 17.64\ Q_s\ (1-B_{ws})\ \frac{P_s}{T_s} =$$

$$Q_{(std)} = 17.64(1684)(1-0.004)\frac{(29.91)}{(542.5)}$$

Q_{std} = 1631 dscfm

8. Isokinetic Variation

$$\%I = K\ \frac{T_s\ V_{m(std)}}{P_s\ V_s\ A_n\ \theta\ (1-B_{ws})}$$

$$= 0.0945\ \frac{(542.5)(45.595)}{(29.91)(26.25)(.00490)(60)(1-0.004)}$$

%I = 101.5 %

Plant: Size
Date: 11-1-84
Source/Sample Number: HCMT-3

1. $V_{m(std)} = 17.64\ V_m\ Y \left[\frac{P_{bar} + (\Delta H/13.6)}{T_m}\right]$

$V_{m(std)} = 17.64(46.627)(1.011)\left[\frac{(30.06) + (2.24/13.6)}{(538.1)}\right]$

$V_{m(std)}$ = 46.707 dscf

2. Volume Water Vapor Collected, Standard Conditions

V_{lc} = 6.1 condensate from impingers and Silica Gel

$V_{W(std)} = .04707\ V_{lc}$ = 0.287 scf

$V_{W(std)}$ = 0.287 scf

3. Percent Moisture, by volume

$B_{Ws} = \frac{V_{W(std)}}{V_{W\ std} + V_{m\ (std)}} = \frac{(0.287)}{(0.287)+(46.707)} = 0.006$

B_{Ws} = 0.6%

4. Molecular Weight, Stack gas

Dry Molecular Wight

$M_d = 0.440\ (\%\ CO_2) + 0.320\ (\%\ O_2) + 0.280\ (\%\ N_2 + \%\ CO)$

$M_d = 0.440(\quad) + 0.320(\quad) + 0.280(\quad)$

M_d = 29.0 lb/lb-mole

$M_s = M_d + B_{Ws}(18 - M_d) = (29.0) + (0.006)(18 - 29.0)$

M_s = [illegible] lb/lb-mole

PES

Plant: SIZE Control
Date: 11-1-84
Source/Sample Number: HCMI-3

5. Stack Gas Velocity Average

$$V_{s(avg)} = 85.49\ C_p \left(\sqrt{\Delta P}\right)_{avg} \sqrt{\frac{T_s}{P_s M_s}}$$

$$V_{s(avg)} = 85.49(0.84)(0.4849)\sqrt{\frac{(535.6)}{(30.02)(28.93)}}$$

$V_{s(avg)}$ = 27.35 ft/sec.

6. Stack Volumetric Flow Rate, Actual Conditions (Stack Temperature and Pressure)

$$Q_s = 60\ V_s\ A = 60\ (27.35)(1.069)$$

Q_s = 1754 acfm

7. Stack volumetric flow rate, standard conditions (68° F, 29.92 Hg)

$$Q_{(std)} = 17.64\ Q_s\ (1-B_{ws})\ \frac{P_s}{T_s} =$$

$$Q_{(std)} = 17.64(1754)(1-0.006)\frac{(30.02)}{(535.6)}$$

Q_{std} = 1724 dscfm

8. Isokinetic Variation

$$\%I = K\ \frac{T_s\ V_{m(std)}}{P_s\ V_s\ A_n\ \theta\ (1-B_{ws})}$$

$$= 0.0945\ \frac{(535.6)(46.707)}{(30.02)(27.35)(0.00467)(60)(1-0.006)}$$

%I = 98.3 %

PES

Plant: Size Control
Date: ~~TDS~~ 11-1-99
Source/Sample Number: HONT-4

1. $V_{m(std)} = 17.64\ V_m\ Y \left[\frac{P_{bar} + (\Delta H/13.6)}{T_m}\right]$

$V_{m(std)} = 17.64(47.57)(.011)\left[\frac{(30.06) + (2.19/13.6)}{(552.6)}\right]$

$V_{m(std)} =$ 45.596 dscf

2. Volume Water Vapor Collected, Standard Conditions

$V_{lc} =$ 9.8 condensate from impingers and Silica Gel

$V_{W(std)} = .04707\ V_{lc} =$ 0.46 scf

$V_{W(std)} =$ 0.46 scf

3. Percent Moisture, by volume

$B_{ws} = \frac{V_{W(std)}}{V_{W\ std} + V_{m\ (std)}} = \frac{(0.461)}{(0.461) + (45.596)} =$ 0.01

$B_{ws} =$ 1%

4. Molecular Weight, Stack gas

Dry Molecular Wight

$M_d = 0.440\ (\%\ CO_2) + 0.320\ (\%\ O_2) + 0.280\ (\%\ N_2 + \%\ CO)$

$M_d = 0.440(\quad) + 0.320(\quad) + 0.280(\quad)$

$M_d =$ 29.0 lb/lb-mole

$M_s = M_d + B_{ws}(18 - M_d) = (29.0) + (0.01)(18 - 29.0)$

$M_s =$ 28.89 lb/lb-mole

PES

Plant: Size Control
Date: 11-1-[illegible]
Source/Sample Number: HCUT-4

5. Stack Gas Velocity Average

$$V_{s(avg)} = 85.49\ C_p \left(\sqrt{\Delta P}\right)_{avg} \sqrt{\frac{T_s}{P_s M_s}}$$

$$V_{s(avg)} = 85.49(0.84)(0.4543)\sqrt{\frac{(543.6)}{(28.89)(30.02)}}$$

$V_{s(avg)}$ = 27.53 ft/sec.

6. Stack Volumetric Flow Rate, Actual Conditions (Stack Temperature and Pressure)

$$Q_s = 60\ V_s\ A = 60\ (27.53)(1.069)$$

Q_s = 1766 acfm

7. Stack volumetric flow rate, standard conditions (68° F, 29.92 Hg)

$$Q_{(std)} = 17.64\ Q_s\ (1-B_{ws})\ \frac{P_s}{T_s} =$$

$$Q_{(std)} = 17.64(1766)(1-0.01)\frac{(30.02)}{(543.6)}$$

Q_{std} = 1703 dscfm

8. Isokinetic Variation

$$\%I = K\ \frac{T_s\ V_{m(std)}}{P_s\ V_s\ A_n\ \theta\ (1-B_{ws})}$$

$$= 0.0945\ \frac{(543.6)(45.96)}{(30.02)(27.53)(0.00440)(60)(1-0.01)}$$

%I = 97.8 %

Plant: Sizer Concrete
Date: 11-2-89
Source/Sample Number: HCMI-5

1. $V_{m(std)} = 17.64\ V_m\ Y \left[\frac{P_{bar} + (\Delta H/13.6)}{T_m}\right]$

$V_{m(std)} = 17.64(46.326)(1.011)\left[\frac{(30.05) + (2.15/13.6)}{(544.)}\right]$

$V_{m(std)}$ = 45.923 dscf

2. Volume Water Vapor Collected, Standard Conditions

V_{lc} = 17.6 condensate from impingers and Silica Gel

$V_{W(std)} = .04707\ V_{lc}$ = 0.828 scf

$V_{W(std)}$ = 0.828 scf

3. Percent Moisture, by volume

$B_{ws} = \frac{V_{W(std)}}{V_{W\ std} + V_{m\ (std)}} = \frac{(0.828)}{(0.828)+(45.923)} = 0.018$

B_{ws} = 1.8%

4. Molecular Weight, Stack gas

Dry Molecular Wight

$M_d = 0.440\ (\%\ CO_2) + 0.320\ (\%\ O_2) + 0.280\ (\%\ N_2 + \%\ CO)$

$M_d = 0.440(\quad) + 0.320(\quad) + 0.280(\quad)$

M_d = 29.0 lb/lb-mole

$M_s = M_d + B_{ws}(18 - M_d) = (29.0) + (0.018)(18 - 29.0)$

M_s = 28.8 lb/lb-mole

Plant: Size Control
Date: 11-2-84
Source/Sample Number: HC UT-5

5. Stack Gas Velocity Average

$$V_{s(avg)} = 85.49\ C_p \left(\sqrt{\Delta P}\right)_{avg} \sqrt{\frac{T_s}{P_s M_s}}$$

$$V_{s(avg)} = 85.49(0.84)(0.4755)\sqrt{\frac{(542.2)}{(30.04)(28.8)}}$$

$V_{s(avg)}$ = 27.03 ft/sec.

6. Stack Volumetric Flow Rate, Actual Conditions (Stack Temperature and Pressure)

$$Q_s = 60\ V_s\ A = 60\ (27.03)(1.069)$$

Q_s = 1734 acfm

7. Stack volumetric flow rate, standard conditions (68° F, 29.92 Hg)

$$Q_{(std)} = 17.64\ Q_s\ (1-B_{ws})\ \frac{P_s}{T_s} =$$

$$Q_{(std)} = 17.64(1734)(1-0.018)\frac{(30.04)}{(542.2)}$$

Q_{std} = 1664 dscfm

8. Isokinetic Variation

$$\%I = K\ \frac{T_s\ V_{m(std)}}{P_s\ V_s\ A_n\ \theta\ (1-B_{ws})}$$

$$= 0.0945\ \frac{(542.2)(45.923)}{(30.04)(27.03)(0.00101)(60)(1-0.018)}$$

%I = 100.2 %

PES

Plant: SIZE Control
Date: 1-2-94
Source/Sample Number: HCMI-6

1. $V_{m(std)} = 17.64\ V_m\ Y \left[\frac{P_{bar} + (\Delta H/13.6)}{T_m}\right]$

$V_{m(std)} = 17.64(46.983)(1.011)\left[\frac{(30.05) + (2.19/13.6)}{(555.6)}\right]$

$V_{m(std)}$ = 45.606 dscf

2. Volume Water Vapor Collected, Standard Conditions

V_{lc} = 6.7 condensate from impingers and Silica Gel

$V_{W(std)} = .04707\ V_{lc}$ = 0.315 scf

$V_{W(std)}$ = 0.315 scf

3. Percent Moisture, by volume

$B_{Ws} = \frac{V_{W(std)}}{V_{W\ std} + V_{m\ (std)}} = \frac{(0.315)}{(0.315)+(45.606)} = 0.007$

B_{Ws} = 0.7 %

4. Molecular Weight, Stack gas

Dry Molecular Wight

$M_d = 0.440\ (\%\ CO_2) + 0.320\ (\%\ O_2) + 0.280\ (\%\ N_2 + \%\ CO)$

$M_d = 0.440(\quad) + 0.320(\quad) + 0.280(\quad)$

M_d = 29.0 lb/lb-mole

$M_s = M_d + B_{Ws}(18 - M_d) = (29.0) + (0.007)(18 - 29.0)$

M_s = 28.92 lb/lb-mole

Plant: SIZE Contrick
Date: 11-2-84
Source/Sample Number: HCMI-6

5. Stack Gas Velocity Average

$$V_{s(avg)} = 85.49\ C_p \left(\sqrt{\Delta P}\right)_{avg} \sqrt{\frac{T_s}{P_s M_s}}$$

$$V_{s(avg)} = 85.49(0.84)(0.4826)\sqrt{\frac{(548)}{(30.04)(28.92)}}$$

$V_{s(avg)}$ = 27.52 ft/sec.

6. Stack Volumetric Flow Rate, Actual Conditions (Stack Temperature and Pressure)

$$Q_s = 60\ V_s\ A = 60\ (27.52)(1.069)$$

Q_s = 1765 acfm

7. Stack volumetric flow rate, standard conditions (68° F, 29.92 Hg)

$$Q_{(std)} = 17.64\ Q_s\ (1-B_{ws})\ \frac{P_s}{T_s} =$$

$$Q_{(std)} = 17.64(1765)(1-0.007)\frac{(30.04)}{(548)}$$

Q_{std} = 1695 dscfm

8. Isokinetic Variation

$$\%I = K\ \frac{T_s\ V_{m(std)}}{P_s\ V_s\ A_n\ \theta\ (1-B_{ws})}$$

$$= 0.0945\ \frac{(548)(45.606)}{(30.04)(27.52)(0.00482)(60)(1-0.007)}$$

%I = 98.3 %

Plant: Size Control
Date: 11-6-89
Source/Sample Number: HAMI-7

1. $V_{m(std)} = 17.64\ V_m\ Y \left[\frac{P_{bar} + (\Delta H/13.6)}{T_m}\right]$

$V_{m(std)} = 17.64(46.255)(1.011)\left[\frac{(30.12) + (2.21/13.6)}{(537.9)}\right]$

$V_{m(std)}$ = 46.441 dscf

2. Volume Water Vapor Collected, Standard Conditions

V_{lc} = 14.7 condensate from impingers and Silica Gel

$V_{W(std)} = .04707\ V_{lc}$ = 0.692 scf

$V_{W(std)}$ = 0.692 scf

3. Percent Moisture, by volume

$B_{Ws} = \frac{V_{W(std)}}{V_{W\ std} + V_{m\ (std)}} = \frac{(0.692)}{(0.692)+(46.441)} = 0.015$

B_{Ws} = 1.5 %

4. Molecular Weight, Stack gas

Dry Molecular Wight

$M_d = 0.440\ (\%\ CO_2) + 0.320\ (\%\ O_2) + 0.280\ (\%\ N_2 + \%\ CO)$

$M_d = 0.440(\quad) + 0.320(\quad) + 0.280(\quad)$

M_d = 29.0 lb/lb-mole

$M_s = M_d + B_{Ws}(18 - M_d) = (29.0) + (0.015)(18 - 29.0)$

M_s = 28.84 lb/lb-mole

Plant: Size Control
Date: 11-6-89
Source/Sample Number: HOMI-7

5. Stack Gas Velocity Average

$$V_{s(avg)} = 85.49\ C_p \left(\sqrt{\Delta P}\right)_{avg} \sqrt{\frac{T_s}{P_s M_s}}$$

$$V_{s(avg)} = 85.49(0.84)(0.4728)\sqrt{\frac{(531.4)}{(30.08)(28.84)}}$$

$V_{s(avg)}$ = 26.57 ft/sec.

6. Stack Volumetric Flow Rate, Actual Conditions (Stack Temperature and Pressure)

$$Q_s = 60\ V_s\ A = 60\ (26.57)(1.069)$$

Q_s = 1704 acfm

7. Stack volumetric flow rate, standard conditions (68° F, 29.92 Hg)

$$Q_{(std)} = 17.64\ Q_s\ (1-B_{ws})\ \frac{P_s}{T_s} =$$

$$Q_{(std)} = 17.64(1704)(1-0.015)\frac{(30.08)}{(531.4)}$$

Q_{std} = 1676 dscfm

8. Isokinetic Variation

$$\%I = K\ \frac{T_s\ V_{m(std)}}{P_s\ V_s\ A_n\ \theta\ (1-B_{ws})}$$

$$= 0.0945\ \frac{(531.4)(46.441)}{(30.08)(26.57)(0.00490)(60)(1-0.015)}$$

%I = 100.6 %

PES

Plant: Size Control
Date: 11-6-89
Source/Sample Number: HCW7-8

1. $V_{m(std)} = 17.64\ V_m\ Y \left[\frac{P_{bar} + (\Delta H/13.6)}{T_m}\right]$

$V_{m(std)} = 17.64(47.201)(.011)\left[\frac{(30.12) + (2.17/13.6)}{(544.6)}\right]$

$V_{m(std)}$ = 46.803 dscf

2. Volume Water Vapor Collected, Standard Conditions

V_{lc} = 20.4 condensate from impingers and Silica Gel

$V_{W(std)} = .04707\ V_{lc}$ = 0.960 scf

$V_{W(std)}$ = 0.960 scf

3. Percent Moisture, by volume

$B_{ws} = \frac{V_{W(std)}}{V_{W\ std} + V_{m\ (std)}} = \frac{(0.960)}{(0.960)+(46.803)} = 0.020$

B_{ws} = 2.0%

4. Molecular Weight, Stack gas

Dry Molecular Wight

$M_d = 0.440\ (\%\ CO_2) + 0.320\ (\%\ O_2) + 0.280\ (\%\ N_2 + \%\ CO)$

$M_d = 0.440(\quad) + 0.320(\quad) + 0.280(\quad)$

M_d = 29.0 lb/lb-mole

$M_s = M_d + B_{ws}(18 - M_d) = (29.0) + (0.020)(18 - 29.0)$

M_s = 28.78 lb/lb-mole

Plant: SIZE CONTROL
Date: 11-6-89
Source/Sample Number: HOUI-8

5. Stack Gas Velocity Average

$$V_{s(avg)} = 85.49\ C_p \left(\sqrt{\Delta P}\right)_{avg} \sqrt{\frac{T_s}{P_s M_s}}$$

$$V_{s(avg)} = 85.49(0.84)(0.4780)\sqrt{\frac{(536.1)}{(30.08)(28.78)}}$$

$V_{s(avg)}$ = 27.0 - ft/sec.

6. Stack Volumetric Flow Rate, Actual Conditions (Stack Temperature and Pressure)

$$Q_s = 60\ V_s\ A = 60\ (27.0)(1.069)$$

Q_s = 1732 acfm

7. Stack volumetric flow rate, standard conditions (68° F, 29.92 Hg)

$$Q_{(std)} = 17.64\ Q_s\ (1-B_{ws})\ \frac{P_s}{T_s} =$$

$$Q_{(std)} = 17.64(1732)(1-0.026)\frac{(30.08)}{(536.1)}$$

Q_{std} = 1680 dscfm

8. Isokinetic Variation

$$\%I = K\ \frac{T_s\ V_{m(std)}}{P_s\ V_s\ A_n\ \theta\ (1-B_{ws})}$$

$$= 0.0945\ \frac{(536.1)(46.503)}{(30.08)(27.0)(0.0876)(60)(1-0.026)}$$

%I = 101.8 %

Plant: Size Control
Date: 11-8-89
Source/Sample Number: HOM I-11

1. $V_{m(std)} = 17.64\ V_m\ Y \left[\frac{P_{bar} + (\Delta H/13.6)}{T_m}\right]$

$V_{m(std)} = 17.64(45.442)(1.011)\left[\frac{(30.04) + (2.10/13.6)}{(538)}\right]$

$V_{m(std)}$ = 45.483 dscf

2. Volume Water Vapor Collected, Standard Conditions

V_{lc} = 11.6 condensate from impingers and Silica Gel

$V_{W(std)} = .04707\ V_{lc}$ = 0.546 scf

$V_{W(std)}$ = 0.546 scf

3. Percent Moisture, by volume

$B_{ws} = \frac{V_{W(std)}}{V_{W\ std} + V_{m\ (std)}} = \frac{(0.546)}{(0.546)+(45.483)} = 0.012$

B_{ws} = 1.2%

4. Molecular Weight, Stack gas

Dry Molecular Wight

$M_d = 0.440\ (\%\ CO_2) + 0.320\ (\%\ O_2) + 0.280\ (\%\ N_2 + \%\ CO)$

$M_d = 0.440(\quad) + 0.320(\quad) + 0.280(\quad)$

M_d = 29.0 lb/lb-mole

$M_s = M_d + B_{ws}(18 - M_d) = (29.0) + (0.012)(18 - 29.0)$

M_s = 28.87 lb/lb-mole

Plant: Size Control
Date: 11-8-89
Source/Sample Number: HONI-11

5. Stack Gas Velocity Average

$$V_{s(avg)} = 85.49\ C_p \left(\sqrt{\Delta P}\right)_{avg} \sqrt{\frac{T_s}{P_s M_s}}$$

$$V_{s(avg)} = 85.49 (0.84)(0.4699) \sqrt{\frac{(535.2)}{(30.0)(28.87)}}$$

$V_{s(avg)}$ = 26.53 ft/sec.

6. Stack Volumetric Flow Rate, Actual Conditions (Stack Temperature and Pressure)

$$Q_s = 60\ V_s\ A = 60\ (26.53)(1.069)$$

Q_s = 170.2 acfm

7. Stack volumetric flow rate, standard conditions (68° F, 29.92 Hg)

$$Q_{(std)} = 17.64\ Q_s\ (1-B_{ws})\ \frac{P_s}{T_s} =$$

$$Q_{(std)} = 17.64(170.2)(1-0.012)\frac{(30.0)}{(535.2)}$$

Q_{std} = 166.3 dscfm

8. Isokinetic Variation

$$\%I = K\ \frac{T_s\ V_{m(std)}}{P_s\ V_s\ A_n\ \theta\ (1-B_{ws})}$$

$$= 0.0945\ \frac{(535.2)(45.483)}{(30.0)(26.53)(0.0104576)(60)(1-0.012)}$$

%I = 100.0 %

Plant: Size Control
Date: 11-8-89
Source/Sample Number: HOMI-12

1. $V_{m(std)} = 17.64\ V_m\ Y \left[\frac{P_{bar} + (\Delta H/13.6)}{T_m}\right]$

$V_{m(std)} = 17.64(45.306)(1.011)\left[\frac{(30.04) + (2.0/13.6)}{(550.0)}\right]$

$V_{m(std)}$ = 44.347 dscf

2. Volume Water Vapor Collected, Standard Conditions

V_{lc} = 10.5 condensate from impingers and Silica Gel

$V_{W(std)} = .04707\ V_{lc}$ = 0.494 scf

$V_{W(std)}$ = 0.494 scf

3. Percent Moisture, by volume

$B_{ws} = \frac{V_{W(std)}}{V_{W\ std} + V_{m\ (std)}} = \frac{(0.494)}{(0.494)+(44.347)} = 0.011$

B_{ws} = 1.1 %

4. Molecular Weight, Stack gas

Dry Molecular Wight

$M_d = 0.440\ (\%\ CO_2) + 0.320\ (\%\ O_2) + 0.280\ (\%\ N_2 + \%\ CO)$

$M_d = 0.440(\quad) + 0.320(\quad) + 0.280(\quad)$

M_d = 29.0 lb/lb-mole

$M_s = M_d + B_{ws}(18 - M_d) = (29.0) + (0.011)(18 - 29.0)$

M_s = 28.88 lb/lb-mole

Plant: Size Control
Date: 11-26-84
Source/Sample Number: HONI-12

5. Stack Gas Velocity Average

$$V_{s(avg)} = 85.49\ C_p \left(\sqrt{\Delta P}\right)_{avg} \sqrt{\frac{T_s}{P_s M_s}}$$

$$V_{s(avg)} = 85.49(0.84)(0.4608)\sqrt{\frac{(542.7)}{(30.0)(28.83)}}$$

$V_{s(avg)}$ = 26.19 ft/sec.

6. Stack Volumetric Flow Rate, Actual Conditions (Stack Temperature and Pressure)

$$Q_s = 60\ V_s\ A = 60\ (26.19)(1.069)$$

Q_s = 1680 acfm

7. Stack volumetric flow rate, standard conditions (68° F, 29.92 Hg)

$$Q_{(std)} = 17.64\ Q_s\ (1-B_{ws})\ \frac{P_s}{T_s} =$$

$$Q_{(std)} = 17.64(1680)(1-0.011)\frac{(30.0)}{(542.7)}$$

Q_{std} = 1620 dscfm

8. Isokinetic Variation

$$\%I = K\ \frac{T_s\ V_{m(std)}}{P_s\ V_s\ A_n\ \theta\ (1-B_{ws})}$$

$$= 0.0945\ \frac{(542.7)(49.347)}{(30.0)(26.19)(0.000464)(60)(1-0.011)}$$

%I = 99.4 %

Plant: Size Control
Date: 11-7-89
Source/Sample Number: HOM I-9

1. $V_{m(std)} = 17.64\ V_m\ Y \left[\frac{P_{bar} + (\Delta H/13.6)}{T_m}\right]$

$V_{m(std)} = 17.64(45.909)(1.011)\left[\frac{(29.99) + (2.15/13.6)}{(537.8)}\right]$

$V_{m(std)}$ = 45.892 dscf

2. Volume Water Vapor Collected, Standard Conditions

V_{lc} = 7.9 condensate from impingers and Silica Gel

$V_{W(std)} = .04707\ V_{lc}$ = 0.372 scf

$V_{W(std)}$ = 0.372 scf

3. Percent Moisture, by volume

$B_{Ws} = \frac{V_{W(std)}}{V_{W\ std} + V_{m\ (std)}} = \frac{(0.372)}{(0.372)+(45.892)} = 0.008$

B_{Ws} = 0.8 %

4. Molecular Weight, Stack gas

Dry Molecular Wight

$M_d = 0.440\ (\%\ CO_2) + 0.320\ (\%\ O_2) + 0.280\ (\%\ N_2 + \%\ CO)$

$M_d = 0.440(\quad) + 0.320(\quad) + 0.280(\quad)$

M_d = 29.0 lb/lb-mole

$M_s = M_d + B_{Ws}(18 - M_d) = (29.0) + (0.008)(18 - 29.0)$

M_s = 28.91 lb/lb-mole

Plant: Size Control
Date: 11-7-84
Source/Sample Number: HOMI-9

5. Stack Gas Velocity Average

$$V_{s(avg)} = 85.49\ C_p \left(\sqrt{\Delta P}\right)_{avg} \sqrt{\frac{T_s}{P_s M_s}}$$

$$V_{s(avg)} = 85.49(0.84)(0.4770)\sqrt{\frac{(532.7)}{(29.95)(28.41)}}$$

$V_{s(avg)}$ = 26.87 ft/sec.

6. Stack Volumetric Flow Rate, Actual Conditions (Stack Temperature and Pressure)

$$Q_s = 60\ V_s\ A = 60\ (26.87)(1.069)$$

Q_s = 1723 acfm

7. Stack volumetric flow rate, standard conditions (68° F, 29.92 Hg)

$$Q_{(std)} = 17.64\ Q_s\ (1-B_{ws})\ \frac{P_s}{T_s} =$$

$$Q_{(std)} = 17.64(1723)(1-0.008)\frac{(29.95)}{(532.7)}$$

Q_{std} = 1695 dscfm

8. Isokinetic Variation

$$\%I = K\ \frac{T_s\ V_{m(std)}}{P_s\ V_s\ A_n\ \theta\ (1-B_{ws})}$$

$$= 0.0945\ \frac{(532.7)(45.892)}{(29.95)(26.87)(0.00104)(60)(1-0.008)}$$

%I = 98.2 %

PES

Plant: Size Control
Date: 11-7-89
Source/Sample Number: HOMI-10

1. $V_{m(std)} = 17.64\ V_m\ Y \left[\frac{P_{bar} + (\Delta H/13.6)}{T_m}\right]$

$V_{m(std)} = 17.64(47.307)(1.011)\left[\frac{(29.99) + (2.22/13.6)}{(543.4)}\right]$

$V_{m(std)}$ = 46.815 dscf

2. Volume Water Vapor Collected, Standard Conditions

V_{lc} = 16.3 condensate from impingers and Silica Gel

$V_{W(std)} = .04707\ V_{lc}$ = 0.485 scf

$V_{W(std)}$ = 0.485 scf

3. Percent Moisture, by volume

$B_{ws} = \frac{V_{W(std)}}{V_{W\ std} + V_{m\ (std)}} = \frac{(0.485)}{(0.485)+(46.815)} = 0.010$

B_{ws} = 1.0%

4. Molecular Weight, Stack gas

Dry Molecular Wight

$M_d = 0.440\ (\%\ CO_2) + 0.320\ (\%\ O_2) + 0.280\ (\%\ N_2 + \%\ CO)$

$M_d = 0.440(\quad) + 0.320(\quad) + 0.280(\quad)$

M_d = 29.0 lb/lb-mole

$M_s = M_d + B_{ws}(18 - M_d) = (29.0) + (0.01)(18 - 29.0)$

M_s = 28.89 lb/lb-mole

Plant: Size Control
Date: 11-7-84
Source/Sample Number: HONI-10

5. Stack Gas Velocity Average

$$V_{s(avg)} = 85.49\ C_p \left(\sqrt{\Delta P}\right)_{avg} \sqrt{\frac{T_s}{P_s M_s}}$$

$$V_{s(avg)} = 85.49(0.84)(0.4857)\sqrt{\frac{(534.8)}{(29.95)(28.59)}}$$

$V_{s(avg)}$ = 27.42 ft/sec.

6. Stack Volumetric Flow Rate, Actual Conditions (Stack Temperature and Pressure)

$$Q_s = 60\ V_s\ A = 60\ (27.42)(1.069)$$

Q_s = 1759 acfm

7. Stack volumetric flow rate, standard conditions (68° F, 29.92 Hg)

$$Q_{(std)} = 17.64\ Q_s\ (1-B_{ws})\ \frac{P_s}{T_s} =$$

$$Q_{(std)} = 17.64(1759)(1-0.01)\frac{(29.95)}{(534.8)}$$

Q_{std} = 1728 dscfm

8. Isokinetic Variation

$$\%I = K\ \frac{T_s\ V_{m(std)}}{P_s\ V_s\ A_n\ \theta\ (1-B_{ws})}$$

$$= 0.0945\ \frac{(534.8)(46.815)}{(29.95)(27.42)(0.0082)(60)(1-0.01)}$$

%I = 99.6 %

Chain of Custody Record

TMA
Thermo Analytical Inc.
100 Taylor Street
Post Office Box 2360
Monrovia, CA 91016
(818) 357-3247

DATE 10/31/87 PAGE 1 OF 1

CLIENT Pacific Environmental Services Inc
ADDRESS 818 357-1993

PROJECT

SAMPLERS (SIGNATURE) Mark J. Simon

SAMPLE NO	DATE	TIME	LOCATION	CAM Metals (17)	Pr. Pollutant Metals (13)	Hazardous Char. (Request List)	Gen. Minerals (Request List)	TPHC 418.1	Base/Neu/Acids (Organics)	Pesticides	Volatile Orgs. (601/602)	8015 Modified	Volatile Orgs. (624/8240)	Hexavalent Chrome	Total Chrome	Volume	Sample Type	NUMBER OF CONTAINERS	Observations/ Comments
HOMI-1L	10/31	1430												X	X	X	Liquid	2	See Below
HOMI-2L														X	X	X	Liquid	2	
HOMI-1F														X	X		Filter	1	
HOMI-2F														X	X		Filter	1	
31 TB														X	X		Liquid	2	
31 FB														X	X		Filter	1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY	DATE
Signature: Mark J Simon	10/31	Signature: Brian Davis	10/31/87	Signature:		Signature:	
Printed Name: Mark J Simon	TIME 1430	Printed Name: BRIAN DAVIS	TIME 3:40	Printed Name:	TIME	Printed Name:	TIME
Company: P.E.S.		Company: TMA/ARLI		Company:		Company:	

RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY (laboratory)	DATE
Signature:		Signature:		Signature:		Signature:	
Printed Name:	TIME	Printed Name:	TIME	Printed Name:	TIME	Printed Name: TMA, Inc./ARLI	TIME
Company:		Company:		Company:			

TOTAL NUMBER OF CONTAINERS

METHOD OF SHIPMENT: Delivered Personally

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS: Expect Medium Concentration

[redacted] 10/31/89 [redacted] 11/03/89 15:44:02 [redacted]

REPORT TO: Pacific Environmental Service
150 E. Foothill Blvd
Arcadia, CA 91006

ATTN: Mr. Dean High

CLIENT: PACIFIC ENVI SAMPLES 6
COMPANY: Pacific Environmental Service
FACILITY:

TEST ID: Chromium Analysis
TAKEN: By Pacific Environ. staff
TRANS: By Pacific Environ. staff
TYPE: Liquid and filters
P.O. #: 3991
INVOICE: under separate cover

PREPARED BY: Thermo Analytical, Inc.
160 Taylor Street
Monrovia, CA 91016

Robert S. Fayman
CERTIFIED BY

ATTEN:
PHONE: 818-357-3247

CONTACT: RSF

This report is for the sole and exclusive use of the client to whom it is addressed and represents only those samples herein described. Samples not destroyed in testing are retained a maximum of 30 days unless otherwise requested.

Verbal results reported to Scott on November 2, 1989

SAMPLE IDENTIFICATION

HCMI-1L
HCMI-2L
HCMI-1F
HCMI-2F
FFB
FFB

TEST CODES and NAMES used on this report

CRHEXS	Hexavalent Chromium
CRHGAA	Chromium - Air
CR HEX	Hexavalent Chromium
CR L	Chromium - Liquids
VOL L	Sample Volume

SAMPLE ID HOMI-1L SAMPLE # 01 FRACTIONS: A
Date & Time Collected 10/31/89 Category

CR HEX 2.03 mg/L CR L 2.17 mg/L VOL L 715 mls

SAMPLE ID HOMI-2L SAMPLE # 02 FRACTIONS: A
Date & Time Collected 10/31/89 Category

CR HEX 5.63 mg/L CR L 5.21 mg/L VOL L 700 mls

SAMPLE ID HOMI-1F SAMPLE # 03 FRACTIONS: A
Date & Time Collected 10/31/89 Category

CRHEXS 9.8 ug/filter CRHGAA 16.5 ug/Filter

SAMPLE ID HOMI-2F SAMPLE # 04 FRACTIONS: A
Date & Time Collected 10/31/89 Category

CRHEXS 3.2 ug/filter CRHGAA 9.9 ug/Filter

Received: 10/31/89

Results by Sample

SAMPLE ID 31FB

SAMPLE # 05 FRACTIONS: A

Date & Time Collected 10/31/89 Category

CHEX5 <0.5 ug/Filter CRHGAA <0.2 ug/Filter

SAMPLE ID 31TB

SAMPLE # 06 FRACTIONS: A

Date & Time Collected 10/31/89 Category

CR HEX <0.003 mg/L CR L 0.001 mg/L

liquids and three filters were analyzed for hexavalent and total chromium content, according to EPA Method 425. The volumes of two liquids were measured. Please see the enclosed tables for the results.

TMA Chain of Custody Record

Thermo Analytical Inc.

160 Taylor Street
Post Office Box 2360
Monrovia, CA 91016
(818) 357-3247

DATE Nov. 01/89 PAGE 1 OF 1

CLIENT Pacific Environmental
ADDRESS 818 357-1993

PROJECT

SAMPLERS (SIGNATURE) Mark J. Simon

SAMPLE NO	DATE	TIME	LOCATION	CAM Metals (17)	Pr. Pollutant Metals (13)	Hazardous Char. (Request List)	Gen. Minerals (Request List)	TPHC 418.1	Base/Neu/Acids (Organics)	Pesticides	Volatile Orgs. (601/602)	8015 Modified	Volatile Orgs. (624/8240)	Hexavalent Chrome	Total Chrome	Volume	Sample Type	NUMBER OF CONTAINERS	Observations/ Comments
HOMI-3L	11/1/89	1500												X	X	X	Liquid	2	
HOMI-3F														X	X		Filter	1	
HOMI-4L														X	X	X	Liquid	2	
HOMI-4F														X	X		Filter	1	
HOMI-1B														X	X		Liquid	2	
HOMI-1FB														X	X		Filter	1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY	DATE
Signature Scott Parks	11/1	Signature		Signature		Signature	
Printed Name PES	TIME 1500	Printed Name	TIME	Printed Name	TIME	Printed Name	TIME
Company		Company		Company		Company	

RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY (laboratory)	DATE
Signature Mark J. Simon		Signature Brian Davis	11/1/89	Signature		Signature	
Printed Name Mark J. Simon	TIME	Printed Name BRIAN DAVIS	TIME 4:00 PM	Printed Name	TIME	Printed Name TMA, Inc./ARLI	TIME
Company		Company TMA ARLI		Company			

TOTAL NUMBER OF CONTAINERS 9

METHOD OF SHIPMENT Delivered Personally

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS: Expect Median Concentrations

Date 11/07/89 11/08/89 09:07:07

Pacific Environmental Service
38 E. Foothill Blvd.
Arcadia, CA 91006

Attn: Dean High

Job: Pacific Envi SAMPLES
Pacific Environmental Service

Chromium Analysis
Sampled By Pacific Environ. Staff
Rec'd By Pacific Environ. Staff
Type Liquid and Filters
Job # 3921
Source under separate cover

PREPARED BY Thermo Analytical Inc.
160 Taylor Street
Monrovia, CA 91016

ATTEN
PHONE 818-357-3247

Robert S. Ferguson
CERTIFIED BY

CONTACT REF

This report is for the sole and exclusive use of the client to whom it is addressed and represents only those samples herein described. Samples not destroyed in testing are retained a maximum of 30 days unless otherwise requested.

Verbal results given to Scott on 11/7/89.

SAMPLE IDENTIFICATION

HOMI-3L
HOMI-4L
HOMI-1TB
HOMI-3F
HOMI-4F
HOMI-1FB

TEST CODES and NAMES used on this report

CRHEXS	Hexavalent Chromium
CRHGAA	Chromium - Air
CR HEX	Hexavalent Chromium
CR L	Chromium - Liquids
VOL L	Sample Volume

Received: 11/02/89 Results by Sample

SAMPLE ID HUMI-3L SAMPLE # 01 FRACTIONS: A
Date & Time Collected 11/01/89 Category

CR HEX 6.66 mg/L CR L 8.23 mg/L VOL L 570 mls

SAMPLE ID HUMI-4L SAMPLE # 02 FRACTIONS: A
Date & Time Collected 11/01/89 Category

CR HEX 9.50 mg/L CR L 9.66 mg/L VOL L 850 mls

SAMPLE ID HUMI-1TB SAMPLE # 03 FRACTIONS: A
Date & Time Collected 11/01/89 Category

CR HEX 0.003 mg/L CR L 0.002 mg/L

SAMPLE ID HUMI-3F SAMPLE # 04 FRACTIONS: A
Date & Time Collected 11/01/89 Category

CRFAS 22.5 ug/Filter CRHGAA 26.2 ug/Filter

Sample ID NOMI-4F SAMPLE # 05 FRACTIONS: A
Date & Time Collected 11/01/89 Category

[illegible]	12.0 ug/Filter	CRHGAA	13.5 ug/Filter

Sample ID NOMI-1FB SAMPLE # 06 FRACTIONS: A
Date & Time Collected 11/01/89 Category

[illegible]	<0.5 ug/Filter	CRHGAA	<0.2 ug/Filter

Arli Environmental Service

Three liquids and three filters were analyzed for hexavalent and total chromium content according to EPA Method 425. The volumes of two liquids were measured. Please see the enclosed tables for the results.

TMA/ARLI *160 Taylor Street / Monrovia, CA 91016 / (818) 357-3247 / FAX (818) 359-5036*

[redacted]

Mailed 11/09/89 11/08/89 09:02:49

FROM: Pacific Environmental Service
TO: 150 E. Foothill Blvd.
Arcadia, CA 91006

ATTN: Mr. Dean High

REF: PACIFIC ENVI SAMPLES o
COMPANY: Pacific Environmental Service
SITE:

RE: 3921-Chromium Analysis
TAKEN: by Pacific Environ. staff
BY: By Pacific Environ. staff
TYPE: Liquid and Filters
3921
NOTES: under separate cover

PREPARED BY: Therma Analytical, Inc.
160 Taylor Street
Monrovia, CA 91016

Robert S. Ferguson
CERTIFIED BY

ATTEN
PHONE 818-357-3247

CONTACT RSF

This report is for the sole and exclusive use of the client to whom it is addressed and represents only those samples herein described. Samples not destroyed in testing are retained a maximum of 30 days unless otherwise requested.

Verbal results given to Scott on 11/7/89.

SAMPLE IDENTIFICATION

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

TEST CODES and NAMES used on this report

CRHEXS	Hexavalent Chromium
CRHGAA	Chromium - Air
CR HEX	Hexavalent Chromium
CR L	Chromium - Liquids
VOL L	Sample Volume

TMA
Thermo Analytical Inc.

TMA/ARLI
160 Taylor Street
Post Office Box 2360
Monrovia, CA 91016
(818) 357-3247

Chain of Custody Record

DATE 11-2-89 PAGE 1 OF 1

CLIENT Pacific Environmental Services
ADDRESS (818) 357 1993
PROJECT 3771
SAMPLERS (SIGNATURE) Mark J. Simon

SAMPLE NO	DATE	TIME	LOCATION	CAM Metals (17)	Pr. Pollutant Metals (13)	Hazardous Char. (Request List)	Gen. Minerals (Request List)	TPHC 418.1	Base/Neu/Acids (Organics)	Pesticides	Volatile Orgs. (601/602)	8015 Modified	Volatile Orgs. (624/8240)	Hexavalent Chrome	Total Chrome	Volume	Sample Type	NUMBER OF CONTAINERS	Observations/ Comments
HOMI-6L	11/2/89	1400												X	X	X	Liquid	2	See Below
HOMI-6F	↓	↓												X	X		Filter	1	↓
HOMI-5L														X	X	X	Liquid	2	
HOMI-5F														X	X		Filter	1	
HOMI-2TB														X	X		Liquid	2	
HOMI-2FB														X	X		Filter	1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY	DATE
Signature: Mark J. Simon	11/2	Signature: Brian Davis	11/2/89	Signature:		Signature:	
Printed Name: Mark J. Simon	TIME 1530	Printed Name: BRIAN DAVIS	TIME 3:40 PM	Printed Name:	TIME	Printed Name:	TIME
Company: PES		Company: TMA/ARLI		Company:		Company:	

RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY (laboratory)	DATE
Signature:		Signature:		Signature:		Signature:	
Printed Name:	TIME	Printed Name:	TIME	Printed Name:	TIME	Printed Name: TMA, Inc./ARLI	TIME
Company:		Company:		Company:			

TOTAL NUMBER OF CONTAINERS

METHOD OF SHIPMENT: Delivered Personally

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS: Expect Medium Concentrations of Chrome

[redacted]

11/02/89 Results by Sample

SAMPLE ID HOMI-8L SAMPLE # 01 FRACTIONS: A
Date & Time Collected 11/02/89 Category

CR HEX 12.4 mg/L CR L 11.4 mg/L VOL L 820 mls

SAMPLE ID HOMI-5L SAMPLE # 02 FRACTIONS: A
Date & Time Collected 11/02/89 Category

CR HEX 2.57 mg/L CR L 2.87 mg/L VOL L 920 mls

SAMPLE ID HOMI-2TB SAMPLE # 03 FRACTIONS: A
Date & Time Collected 11/02/89 Category

CR HEX <0.003 mg/L CR L 0.004 mg/L

SAMPLE ID HOMI-6F SAMPLE # 04 FRACTIONS: A
Date & Time Collected 11/02/89 Category

CRHEXS 7.24 ug/Filter CRHGAA 11.6 ug/Filter

Received: 11/02/89 Results by Sample

SAMPLE ID HOMI-5F SAMPLE # 05 FRACTIONS: A
Date & Time Collected 11/02/89 Category

[illegible]	36.5 ug/Filter	CRHGAA	50.6 ug/Filter

SAMPLE ID HOMI-2FB SAMPLE # 06 FRACTIONS: A
Date & Time Collected 11/02/89 Category

[illegible]	<0.5 ug/Filter	CRHGAA	<0.2 ug/Filter

Environmental Service

Three liquids and three filters were analyzed for hexavalent and total chromium content, according to EPA Method 425. The volumes of two liquids were measured. Please see the enclosed tables for the results.

TMA/ARLI *160 Taylor Street / Monrovia, CA 91016 / (818) 357-3247 / FAX (818) 359-5036*

Chain of Custody Record

TMA/ARLI
Taylor Mill
Thermo Analytical Inc.
Post Office Box 2360
Monrovia, CA 91016
(818) 357-3247

DATE 11-6-89 PAGE 1 OF 1

CLIENT Pacific Environmental
ADDRESS (818) 355 6467
PROJECT 3921
SAMPLERS (SIGNATURE) [illegible]

SAMPLE NO	DATE	TIME	LOCATION	CAM Metals (17)	Pr. Pollutant Metals (13)	Hazardous Char. (Request List)	Gen. Minerals (Request List)	TPHC 418.1	Base/Neu/Acids (Organics)	Pesticides	Volatile Orgs. (601/602)	8015 Modified	Volatile Orgs. (624/8240)	Hexavalent Chromium	Total Chromium	Volume	Sample Type	NUMBER OF CONTAINERS	Observations/ Comments
MMI-7L	11-6-89													X	X	X	Liquid	2	
MMI-7F	↓													X	X		Filter	1	
MMI 8L														X	X	X	Liquid	2	
MMI 8F														X	X		Filter	1	
MMI 6TB														X	X		Liquid	2	
MMI-6FB														X	X		Filter	1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY	DATE
Scott G Parks	11/6/89	Brian Davis	11/6/89				
Signature: Scott G Parks	TIME	Signature: BRIAN DAVIS	TIME 4:30 PM	Signature	TIME	Signature	TIME
Printed Name: P.E.S.		Printed Name: TMA/ARLI		Printed Name		Printed Name	
Company		Company		Company		Company	

RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY (laboratory)	DATE
Signature	TIME	Signature	TIME	Signature	TIME	Signature	TIME
Printed Name		Printed Name		Printed Name		Printed Name: TMA, Inc./ARLI	
Company		Company		Company			

TOTAL NUMBER OF CONTAINERS: 9

METHOD OF SHIPMENT: Delivered Personal

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS

TMA Inc. REPORT Work Order # 89-11-050

11/06/89 11/10/89 09:57:42

FROM: Pacific Environmental Service
150 E. Foothill Blvd.
Arcadia, CA 91006

PREPARED BY: Thermo Analytical
160 Taylor Street
Monrovia, CA 91016

Robert S. Ferguson
CERTIFIED BY

ATTN: Mr. Dave Hill

ATTEN:
PHONE: 818-357-3247

CONTACT: RSF

RE: PACIFIC ENVI SAMPLES &
Pacific Environmental Service

This report is for the sole and exclusive use of the client to whom it is addressed and represents only those samples herein described. Samples not destroyed in testing are retained a maximum of 30 days unless otherwise requested.

Results given to Mark Simon @ 11/8/89

TEST ID: Chrome Analysis
TAKEN: By Pacific Environ. Staff
BY: By Pacific Environ. Staff
MATRIX: Liquid and Filters
JOB #: 3721
NOTICE: under separate cover

SAMPLE IDENTIFICATION

HOMI-7L
HOMI-8L
HOMI-6TB
HOMI-7F
HOMI-8F
HOMI-6FB

TEST CODES and NAMES used on this report

CRHEXS	Hexavalent Chromium
CRHGAA	Chromium - Air
CR HEX	Hexavalent Chromium
CR LF	Chromium by HGF - Liquids
VOL L	Sample Volume

TMA Inc. REPORT Work Order # 89-11-050

Date: 11/05/89 Results by Sample

SAMPLE ID HOMI-7L SAMPLE # 01 FRACTIONS: A
Date & Time Collected 11/05/89 Category

CR HEX 0.07 mg/L CR LF 0.074 mg/L VOL. L 810 mls

SAMPLE ID HOMI-8L SAMPLE # 02 FRACTIONS: A
Date & Time Collected 11/05/89 Category

CR HEX 0.02 mg/L CR LF 0.027 mg/L VOL. L 750 mls

SAMPLE ID HOMI-6TD SAMPLE # 03 FRACTIONS: A,B
Date & Time Collected 11/06/89 Category

CR HEX-1 0.03 mg/L CR HEX-2 <0.003 mg/L CR LF-1 0.096 mg/L CR LF-2 0.001 mg/L

SAMPLE ID HOMI-7F SAMPLE # 04 FRACTIONS: A
Date & Time Collected 11/05/89 Category

CHEX5 <0.5 ug/Filter CRHGAA 1.20 Total ug

TMA Inc. DuPONT Work Order # 87-11-050

Date: 11/05/87

Results by Sample

SAMPLE ID HOMI-8F

SAMPLE # 05 FRACTIONS: A

Date & Time Collected 11/05/87

Category

CHEX5 <0.5 ug/Filter CRHGAA 1.14 Total ug

SAMPLE ID HOMI-6FB

SAMPLE # 06 FRACTIONS: A

Date & Time Collected 11/05/87

Category

CHEX5 <0.5 ug/Filter CRHGAA 0.22 Total ug

...ic Environmental Service

... liquids and three filters were analyzed for hexavalent and tota... chrom content, according to EPA method 425. The volumes of two ...ds were measured. Please see the enclosed tables for the results

...ITION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

- MPREPO
- MPREPW
- MPREPW
- FILTDI
- FILTDI
- FILTDT

TMA
Thermo Analytical Inc.

160 [illegible] Street
Post Office Box 2360
Monrovia, CA 91016
(818) 357-3247

Chain of Custody Record

COPY

DATE 11-7-89 PAGE 1 OF 1

CLIENT Pacific Environmental
ADDRESS
(818) 357-1993
PROJECT PES
SAMPLERS (SIGNATURE)

SAMPLE NO	DATE	TIME	LOCATION	CAM Metals (17)	Pr. Pollutant Metals (13)	Hazardous Char. (Request List)	Gen. Minerals (Request List)	TPHC 418.1	Base/Neu/Acids (Organics)	Pesticides	Volatile Orgs. (601/602)	8015 Modified	Volatile Orgs. (624/8240)	Total Chrome	Hexavalent Chrome	Volume	Sample Type	NUMBER OF CONTAINERS	Observations/ Comments
HOMI-9F	11-7-89													X	X		Filter	1	
HOMI-9L	↓													X	X	X	Liquid	2	
HOMI-10F														X	X		Filter	1	
HOMI-10L														X	X	X	Liquid	2	
HOMI-7TB														X	X		~~Fil~~ Liquid	2	
HOMI-7FB	↓													X	X		Filter	1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY	DATE
Signature: Scott G. Parks	11-7-89	Signature: Brian Davis	11/7/89	Signature:		Signature:	
Printed Name: Scott G. Parks	TIME 4:00	Printed Name: BRIAN DAVIS	TIME 4:00 PM	Printed Name:	TIME	Printed Name:	TIME
Company: PES		Company: TMA/ARLI		Company:		Company:	
RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY (laboratory)	DATE
Signature:		Signature:		Signature:		Signature:	
Printed Name:	TIME	Printed Name:	TIME	Printed Name:	TIME	Printed Name: TMA, Inc./ARLI	TIME
Company:		Company:		Company:			

9 TOTAL NUMBER OF CONTAINERS

METHOD OF SHIPMENT: Delivered Personally

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS

Received 11/08/89 11/10/89 15:20:41

COMPANY Pacific Environmental Service
ADD 150 E. Foothill Blvd.
Arcadia, CA 91006

ATTN Mr. Dean High

JOB PACIFIC ENVI SAMPLES 5
NAME Pacific Environmental Service
LOCATION

PREPARED Thermo Analytical, Inc
BY 160 Taylor Street
Monrovia, CA 91016

Robert S. Ferguson
CERTIFIED BY

ATTEN
PHONE 818-357-3247 CONTACT RSF

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Verbal results given to Scott on 11/10/89

TEST Chrome Analysis
TAKEN By Pacific Environ. Staff
PREPD By Pacific Environ. Staff
TYPE Liquid and Filters
P.O. # 3921
INVOICE under separate cover

COPY

SAMPLE IDENTIFICATION

1 HOMI-9L
2 HOMI-10L
3 HOMI-7TB
4 HOMI-9F
5 HOMI-10F
6 HOMI-7FB

TEST CODES and NAMES used on this report

CRHEXS	Hexavalent Chromium
CRHGAA	Chromium - Air
CR HEX	Hexavalent Chromium
CR LF	Chromium by HGF - Liquids
VOL L	Sample Volume

Received 11/08/89 Results by Sample

SAMPLE ID HOMI-10F SAMPLE # 05 FRACTIONS: A

Date & Time Collected 11/07/89 Category

CONE/S 0.96 ug/Filter CRHGAA 2.4 ug/Filter

SAMPLE ID HOMI-7FB SAMPLE # 06 FRACTIONS: A

Date & Time Collected 11/07/89 Category

CRHEX6 <0.5 ug/Filter CRHGAA <0.2 ug/Filter

the Environmental Service

[illegible] and three filters were analyzed for hexavalent and total chromium contents according to EPA method 425. The volumes of two [illegible] were measured. Please see the enclosed tables for the results.

LOCATION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

[illegible]	1	10TREMO
[illegible]	1	20REMO
[illegible]	1	30REMO
[illegible]	1	FILT01
[illegible]	1	FILT02
[illegible]	1	FILT03

TMA
Thermo Analytical Inc.

TMA/ARLI
[illegible]

Post Office Box 2360
Monrovia, CA 91016
(818) 357-3247

Chain of Custody Record

DATE 11-8-89 PAGE 1 OF 1

CLIENT Pacific Environmental
ADDRESS
(818) 357-1993
PROJECT 3921
SAMPLERS (SIGNATURE) Scott A Parks

SAMPLE NO	DATE	TIME	LOCATION	CAM Metals (17)	Pr. Pollutant Metals (13)	Hazardous Char. (Request List)	Gen. Minerals (Request List)	TPHC 418.1	Base/Neu/Acids (Organics)	Pesticides	Volatile Orgs. (601/602)	8015 Modified	Volatile Orgs. (624/8240)	Total Chrome	Hexavalent Chrome	Volume	Sample Type	NUMBER OF CONTAINERS	Observations/ Comments
HCMI-11L	11-8-89													X	X	X	Liquid	2	
HCMI-11F														X	X		Filter	1	
HCMI-12L														X	X	X	Liquid	2	
HCMI-12F														X	X		Filter	1	
HCMI-STA														X	X		Liquid	2	
HCMI-8FB														X	X		Filter	1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY	DATE
Signature: Scott A Parks	11-8-89	Signature: Brian Davis	11/8/89	Signature:		Signature:	
Printed Name: Scott Parks	TIME	Printed Name: BRIAN DAVIS	TIME 4:20 PM	Printed Name:	TIME	Printed Name:	TIME
Company: MES		Company: TMA/ARLI		Company:		Company:	

RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY (laboratory)	DATE
Signature:		Signature:		Signature:		Signature:	
Printed Name:	TIME	Printed Name:	TIME	Printed Name:	TIME	Printed Name: TMA, Inc./ARLI	TIME
Company:		Company:		Company:			

TOTAL NUMBER OF CONTAINERS: 9

METHOD OF SHIPMENT: Delivered Personally

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS: Expect medium to low concentrations of Chrome

TMA Inc. REPORT Work Order # 89-11-045

Received 11/09/89 11/10/89 15:28:16

REPORT TO Pacific Environmental Service
150 E. Foothill Blvd.
Arcadia, CA 91006

ATTEN Mr. Dean High

CLIENT PACIFIC ENVI SAMPLES 6
COMPANY Pacific Environmental Service
UNITS

PREPARED BY Thermo Analytical, Inc.
160 Taylor Street
Monrovia, CA 91016

ATTEN
PHONE 818-357-3247

Robert S. Ferguson
CERTIFIED BY

CONTACT RSF

This report is for the sole and exclusive use of the client to whom it is addressed and represents only those samples herein described. Samples not destroyed in testing are retained a maximum of 30 days unless otherwise requested.

Verbal results given to Scott on 11/10/89.

JOB ID Chrome Analysis
TAKEN By Pacific Environ. Staff
TRANS By Pacific Environ. Staff
TYPE Liquid and Filters
P.O. # 3291
INVOICE under separate cover

SAMPLE IDENTIFICATION

H0M1-11L
H0M1-12L
H0M1-07F
H0M1-11F
H0M1-12F
H0M1-07F

TEST CODES and NAMES used on this report

CRHEXS	Hexavalent Chromium
CRHGAA	Chromium - All
CR HEX	Hexavalent Chromium
CR LF	Chromium by HGF - Liquids
VOL L	Sample Volume

Rcvd. 11/09/89 Results by Sample

SAMPLE ID HOMI-11L SAMPLE # 01 FRACTIONS: A
Date & Time Collected 11/08/89 Category

CR HEX 0.15 mg/L CR LF 0.142 mg/L VOL L 800 mls

SAMPLE ID HOMI-12L SAMPLE # 02 FRACTIONS: A
Date & Time Collected 11/08/89 Category

CR HEX 0.13 mg/L CR LF 0.131 mg/L VOL L 815 mls

SAMPLE ID HOMI-8TB SAMPLE # 03 FRACTIONS: A
Date & Time Collected 11/08/89 Category

CR HEX <0.003 mg/L CR LF 0.002 mg/L

SAMPLE ID HOMI-11F SAMPLE # 04 FRACTIONS: A
Date & Time Collected 11/08/89 Category

CRHEXS 2.8 ug/filter CRHGAA 8.3 ug/filter

Arrived: 11/09/89 11/10/89 15:28:16

Pacific Environmental Service

Three liquids and three filters were analyzed for hexavalent and total chromium content, according to EPA method 425. The volumes of two liquids were measured. Please see the enclosed tables for the results.

Received: 11/09/89 NonReported Work

INSPECTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

[illegible]	I	MPREPW
[illegible]	I	MPREPW
[illegible]	I	MPREPW
[illegible]	I	FILTD1
[illegible]	I	FILTD1
[illegible]	I	FILTD1