HORIZON

AIR MEASUREMENT SERVICES, INC.

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RESULTS OF THE CRITERIA AND AB 2588 AIR TOXICS SOURCE TEST ON SIMI VALLEY LANDFILL FLARE #2 (John Zink)

VCAPCD Permit to Operate #01395

Prepared for:

Simi Valley Landfill and Recycling Center
2801 Madera Road
Simi Valley, California 93065

Prepared by:

Horizon Air Measurement Services, Inc.
996 Lawrence Drive, Suite 108
Newbury Park, California 91320

Regulatory Agency:

Ventura County Air Pollution Control District
669 County Square Drive, 2nd Floor
Ventura, California 93003

Richard J. Vacherot
Technical Director

HORIZON

AIR MEASUREMENT SERVICES, INC.

December 16, 2005

Mr. Bruce Matlock
Simi Valley Landfill and Recycling Center
2801 Madera Road
Simi Valley, California 93065

Dear Mr. Matlock:

Please find enclosed three copies of the final report entitled "Results of the Criteria and AB 2588 Air Toxics Source Test on the Simi Valley Landfill Flare" for submittal to VCAPCD.

If you have any questions, please call me at (805) 498-8781.

Sincerely,

HORIZON AIR MEASUREMENT SERVICES, INC.

Richard J. Vacherot
Technical Director

Enclosures

996 LAWRENCE DR., SUITE 108, NEWBURY PARK, CALIFORNIA 91320 • (805) 498-8781 • FAX (805) 498-3173

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1. INTRODUCTION

Under the requirements of Ventura County Air Pollution Control District (VCAPCD) Permit to Operate #01395, Simi Valley Landfill and Recycling Center (SVLRC) is required to conduct a biennial criteria source test on landfill gas Flare #2 (John Zink) located at the landfill to determine emissions of criteria pollutants. In addition, emission rates of air toxic compounds, as defined under AB 2588 legislation and as specified by VCAPCD, are required to be quantified every four years. Horizon Air Measurement Services, Inc. (Horizon) had been retained by SVLRC to conduct the required emissions testing program.

All testing was conducted in accordance with the Source Test Protocol (Horizon # W07-043-TP) of September 2005 which had been formally approved by VCAPCD. Sampling and analytical procedures utilized in the testing program are provided, in detail, in Section 4 of this report. All criteria testing was completed on October 12 and 13, 2005; the air toxics test program was completed from October 12 through 21, 2005. The hexavalent chromium testing was repeated on November 21 and 22, 2005 due to a laboratory error on the original samples.

The criteria pollutants and associated emission parameters tested for and the associated Permit limits are provided in Table 1-1. The destruction efficiency of the flare with respect to ROC was also determined as well as the landfill gas heating value/composition and C_1 to C_3 reduced sulfur compound (including H_2S) concentration. Three replicate test runs were completed for each parameter of interest.

The air toxic target compounds are identical to those quantified during the most recent flare emissions test conducted in 2001 (Horizon Report #W07-031-FR). All target air toxic compounds (Table 1-2) were sampled at the flare exhaust.

A summary of the criteria emissions results and the associated Permit limits are provided in Section 2. A more detailed description and discussion of the criteria pollutants results and the air toxics results are provided in Section 5. Results of the QA/QC procedures are discussed in Section 6.

During air toxic testing, the flare was operating under normal operating conditions. For the criteria testing, the flare landfill gas flow was maximized. A description of the flare and landfill gas collection system and its operation during testing is summarized in Section 3 of this report. All pertinent documentation can be found in the Appendices.

Table 1-1

Criteria Pollutants
Simi Valley Landfill Flare #2
October 2005

Parameter	Permit Limit
Reactive Organic Compounds (ROC)	1.09 lb/hr
Oxides of Nitrogen	0.05 lb/MMBtu 3.75 lb/hour
Carbon Monoxide	0.20 lb/MMBtu
Oxides of Sulfur	0.02 lb/MMBtu 1.50 lb/hr
ROC Destruction Efficiency	98% or 20 ppm, C6 @ 3% O_2

Table 1-2

Air Toxic Compounds of Interest
Simi Valley Landfill Flare #2
October 2005

Parameter	Sampling Location
Speciated VOC's (SCAQMD Rule 1150.1 List) including: ethylene dibromide acrylonitrile 1,4 dioxane 1,1,2,2 tetrachloroethane	Inlet and Outlet
1,3 butadiene	Outlet
Formaldehyde	Outlet
Polycyclic Aromatic Hydrocarbons (PAH's)	Outlet
Hexachlorobenzene	Outlet
Metals	Outlet
Total/Hexavalent Chromium	Outlet
Hydrogen Chloride/Hydrogen Flouride (HCl/HF)	Outlet

2. SUMMARY OF RESULTS

2.1 Criteria Pollutants

The results of the criteria testing test program are summarized in Table 2-1. Emission rate of ROC, NO_x and CO were within the allowable emission limits under the Permit to Operate #01395.

Emission rate of NO_X averaged 1.78 lb/hr and 0.0356 lb/MMBtu which is well below the VCAPCD Rule 74.17.1 limit of 3.75 lb/hr and 0.05 lb/MMBtu, respectively. Emissions of CO averaged 0.0025 lb/MMBtu which is well below the VCAPCD Rule 74.17.1 limit of 0.2 lb/MMBtu. The ROC destruction efficiency average of 99.8% is within the Rule 74.17.1 limit of 98%. Oxides of sulfur emissions averaged 1.07 lb/hr and 0.0175 lb/MMBtu which are within the PTO limits of 1.50 lb/hr and 0.02 lb/MMBtu, respectively.

A more detailed discussion of the criteria testing results are provided in Section 5. Air toxic emissions are also discussed in Section 5.

Table 2-1
Summary of Results
Criteria Pollutants
Simi Valley Landfill - Flare #2
October 2005

	Emission Rate								Allowable Emissions	
	Run 1		Run 2		Run 3		Average			
	(lb/hr)	(lb/MMBtu)	(lb/hr)	(lb/MMBtu)	(lb/hr)	(lb/MMBtu)	(lb/hr)	(lb/MMBtu)	(lb/hr)	(lb/MMBtu)
Reactive Organic Compounds (ROC), as CH_4	0.0766	NA	0.0617	NA	0.0884	NA	0.0756	NA	1.09	NA
Oxides of Nitrogen, as NO_2	1.65	0.0334	1.67	0.0339	2.01	0.0394	1.78	0.0356	3.75	0.05
Carbon Monoxide	0.189	0.0038	0.106	0.0022	0.077	0.0015	0.124	0.0025	NA	0.20
Oxides of Sulfur	0.985	0.0165	1.08	0.0176	1.13	0.0185	1.07	0.0175	1.50	0.02

	Destruction Efficiency									
							Average			
Reactive Organic Compounds	99.8%	----	99.8%	----	99.7%	----	99.8%		98.0%	

3. PROCESS DESCRIPTION

3.1 Flare Description

The landfill gas collection system consists of a series of landfill gas collection wells, a gas collection manifold, a pumping system and the landfill gas flare. Landfill gas, collected from various wells located throughout the landfill, is manifolded to a common duct. The landfill gas then passes through a condensation collection system, a blower, then to the flare.

The John Zink landfill gas flare (Flare #2) is rated at 75 MMBtu/hr and consists of an insulated steel cylinder 11 feet in diameter and 50 feet above ground level. The four sample ports utilized are located 45 feet from ground level and 5 feet from the top of the flare. Landfill gas is continuously monitored and recorded on a strip chart recorder. Flare combustion temperature is maintained above 1400°F to ensure complete combustion and is monitored by a thermocouple, recording temperature on a strip chart. The flare is equipped with automatic air control louvers and a temperature controller to maintain the pre-set flare temperature. A flame failure detector automatically shuts off the blower in the event of a flame out.

3.2 Flare Operation During Testing

During the criteria testing program, the flare was operated at the maximum flow rate achievable. Landfill gas flow rate and flare operating temperature for each criteria test run are provided on Table 3-1.

During the air toxics testing program, the flare was operated at the normal landfill gas flow rate. Landfill gas flow rate and flare operating temperature for the air toxics testing is also provided in Table 3-1.

Table 3-1

Flare Operating Conditions
Simi Valley Landfill Flare #2
October / November 2005

Run#	Landfill Gas Flow Rate (scfm)	Flare Temperature (F)
1 - Criteria pollutants / metals	2177	1622
2 - Criteria pollutants / metals	2179	1625
3 - Criteria pollutants / metals	2177	1623
1 - PAH	1961	1640
1 - Formaldehyde	1848	1632
1 - HCl	1980	1638
2 - HCl	1816	1640
2 - PAH	1666	1648
3 - HCl	1658	1665
2 - Formaldehyde	1652	1642
3 - PAH	1967	1626
3 - Formaldehyde	1833	1635
1 - Chromium	2153	1636
2 - Chromium	2021	1635
3 - Chromium	1912	1634

4. SAMPLING/ANALYSES

The sampling/analyses program has been divided into criteria pollutant testing and air toxics testing.

4.1 Criteria Pollutants

The target compounds quantified as part of the criteria pollutant testing and the associated sampling methods are provided in Table 4-1. Three, replicate test runs were conducted for each parameter of interest using the procedures detailed in subsequent subsections. All methods followed the applicable CARB/SCAQMD testing procedure without modification.

4.1.1 Sampling Location

4.1.1.1 Flare Exhaust

Sample ports are located on the flare approximately 45 feet above ground level and 5 feet from the flare exit. Four sample ports were utilized. Twenty-four traverse points (12 per port) were utilized for velocity, oxides of nitrogen, carbon monoxide and ROC sampling.

4.1.1.2 Flare Inlet - Landfill Gas

Reactive organic compound, fixed gas, and moisture samples were obtained from the landfill gas feed duct at a location at least two diameters downstream and one diameter upstream from a flow disturbance. Landfill gas flow rate was monitored using the on-line, calibrated flow meter operated by Simi Valley Landfill. The flow meter is corrected to standard temperature/pressure and gas density.

Table 4-1

Criteria Pollutants - Test Methods
Simi Valley Landfill Flare
October 2005

Parameter	Test Method
Inlet and Outlet	
Flow Rate	Continuous, On-Line Monitor (Inlet) CARB Method 2 (Outlet)
Fixed Gases (O_2, CO_2, N_2)	CARB Method 100/EPA Method 3A (Outlet) CARB Method 3/SCAQMD Method 10.1
Moisture	Wet Bulb/Dry Bulb (Inlet) CARB Method 4 (Outlet)
ROC/Methane	EPA Method 25 - Modified (Inlet) EPA Method 25 - Modified (Outlet)
Outlet Only	
Carbon Monoxide	CARB Method 100/EPA Method 10
Oxides of Nitrogen	CARB Method 100/EPA Method 7E
Inlet Only	
C_1-C_3 Sulfur Compounds (with H_2S)	SCAQMD Method 307.91 Equivalent
Heating Value	ASTM D3588-91

4.1.2 Methane and Reactive Organic Compounds (ROC)

Methane and Reactive Organic Compounds (ROC) concentration were determined at the landfill gas flare inlet and exhaust using modified EPA Method 25 or EPA Method 25C as provided in VCAPCD Rule 74.17. The modification eliminated the use of a condensate trap and filter in the sample collection system.

Method 25 samples were collected using the SUMMA canister Method outlined in EPA Method 25C as depicted in Appendix A.

The organic content of the sample collected in each SUMMA canister is measured by injecting a portion into the FID/TCA analysis system which uses a two phase gas chromatography (GC) column to separate carbon monoxide (CO), methane (CH_4), and carbon dioxide (CO_2) from each other and from the total gaseous non-methane organics (TGNMO) which are eluted as backflush. All eluted components are first oxidized to CO_2 by a hopcalite catalyst and then reduced to methane by a nickel catalyst. The resulting methane is detected using the flame ionization detector. A gas standard containing CO, CH_4, CO_2 and propane, prepared by Scott Specialty Gases, traceable to NBS, is used to calibrate the FID/TCA analysis system Methane and Reactive Organic Compounds (ROC) concentration was determined at the landfill gas flare inlet using EPA Method 25 (Modified), as described in Appendix A. Three, one-hour test run were conducted simultaneously at the flare inlet and outlet.

4.1.3 Moisture

4.1.3.1 Inlet

Moisture content of the landfill gas was determined using a wet bulb/dry bulb thermometer

4.1.3.2 Outlet

Moisture content of the stack gas was determined in accordance with CARB/EPA Method 4 "Determination of Moisture Content in Stack Gases" as outlined in Appendix A.

4.1.4 Flow Rate

4.1.4.1 Inlet

Inlet flow rate was determined using the facility's calibrated on-line flow meter.

4.1.4.2 Outlet

The flare exhaust flow rate was determined using EPA/CARB Method 2 as detailed in Appendix A.

4.1.5 Oxides of Nitrogen, Carbon Monoxide, Carbon Dioxide, Oxygen (Continuous Emissions Monitoring)

Three test runs were conducted at the landfill gas flare exhaust. Twenty-four points, per Method 1, were sampled. All sampling was performed under the guidelines of CARB Method 100/EPA Method 7E, CARB Method 100/EPA Method 3A and CARB Method 100/EPA Method 10 for the determination of NO_x, O_2, CO_2 and CO concentration. A description of Horizon's CEMS and the applicable EPA Methods, are detailed in Appendix A.

4.1.6 Hydrogen Sulfide (H_2S), and C_1 - C_3 Sulfur Compounds

Hydrogen sulfide and C_1 - C_3 sulfur compounds samples were collected at the inlet of the flare using the Tedlar bag collection system. All samples were analyzed using SCAQMD Method 307.91 equivalent as described in Appendix A.

4.2 Air Toxics Pollutants

All sampling/analytical procedures adhered to CARB test method requirements, where applicable, without modification with the exception of the 1,3 butadiene testing (See Section 4.2.8). Also, the HCl/HF (CARB Method 421) samples were collected non isokinetically and the filter was eliminated (Section 4.2.5). Also, all speciated VOC analyses were completed using GC/MS analyses

instead of various GC/detector configurations (CARB Method 422, 410, etc.) with the exception of acrylonitrile which was analyzed using nitrogen/phosphorus detector (NPD).

4.2.1 Sampling Location

Sample ports are located on the flare approximately 45 feet above ground level and 5 feet from the flare exit. Four sample ports were utilized. Twenty-four traverse points (12 per port) were utilized for metals, chromium, PAH and hexachlorobenzene sampling. A single point in the flare was used for the collection of formaldehyde and HCl/HF.

4.2.2 Polycyclic Aromatic Hydrocarbons (PAH's) and Hexachlorobenzene

Horizon utilized CARB Method 429 as described in Appendix A for PAH/ hexachlorobenzene determination. All sample train extracts were combined for a single analyses.

The collection of PAH and hexachlorobenzene was combined into one sample train, as detailed in the Test Plan. The resultant sample(s) were extracted and then split for respective PAH and hexachlorobenzene analyses. Three replicate test runs were performed. Each test run was approximately four hours in length with a target sample volume of 100 cubic feet.

A leak check of the pitot tube lines and sampling trains is conducted prior to and after each sampling run and prior to and after either changing any of the constituents of the train or disconnecting the umbilical cord to facilitate transport of the train. Leak checks prior to each sampling run are conducted at 15 inches mercury vacuum to insure a leak rate of no greater than 0.02 cfm. Leak checks at the conclusion of each run are conducted at the highest vacuum reached during that test run.

Upon completion of the sample run the nozzle, probe, and front half of the filter holder are brushed and rinsed with methanol, acetone, and methylene chloride (sample container #2). The filter is replaced in its original glass petri dish pending analysis (container #1). The sorbent module (XAD) is capped off with ground glass fittings, covered with pre-treated aluminum foil and refrigerated pending analysis. The back half of the filter housing and Teflon jumper are subsequently rinsed with methanol, acetone, and methylene chloride into sample container #3. The volume of water collected in the first two impingers is determined volumetrically; the moisture collected in the

silica gel in the last impinger is determined gravimetrically with a calibrated balance accurate to 0.1 grams. These two measurements are used to calculate stack gas moisture content as per CARB Method 429. Impinger #1 contents are collected, rinsed with methanol, acetone and methylene chloride and placed in container #4. Impingers #2 and #3 contents are collected and all connecting glassware and impingers are rinsed with distilled deionized water three times into container #5.

All sample bottles and filter containers are sealed with Teflon tape and all liquid levels are marked. All sample bottles are amber glass jars with Teflon-lined caps. All samples are kept on blue ice pending analyses. Each sample portion is extracted sequentially using a 16-hour methylene chloride extraction. One fourth of each sample extract will be analyzed for PAH's using CARB Method 429 and one fourth will be analyzed for hexachlorobenzene. The remaining half are archived. The resulting extracts from each sample portion (ie. container #1, #2, #3, #4 and XAD cartridge) are combined, as allowed, and analyzed using high resolution mass spectrometry (HRGC/HRMS). All analyses was completed by Alta Analytical Service.

A blank train was assembled on-site, recovered and analyzed in the exact manner as the samples. Field blanks of all sorbent filters and solutions were also obtained.

4.2.3 Multimetals

Three, replicate 90 minute test runs were conducted at the flare exhaust. Emissions of the metal species of interest were determined in accordance with CARB Method 436 "Determination of Multiple Metals Emissions from Stationary Sources" as described in Appendix A. In this method the stack sample is withdrawn isokinetically from the source, with particulate emissions collected in the probe and on a heated filter and gaseous emissions collected in a series of chilled impingers containing a solution of dilute nitric acid in hydrogen peroxide in two impingers, and acidic potassium permanganate solution in two impingers. Sampling train components are recovered and digested in separate front and back half fractions. Materials collected in the sampling train are digested with acid solutions to dissolve inorganics and to remove organic constituents that may create analytical interferences. Acid digestion is performed using conventional Parr Bomb or microwave digestion techniques. Except for the permanganate solution, the remainder of the sampling train catches are analyzed for metal species by CARB 436/EPA 6010B

The sampling train consists of a quartz buttonhook nozzle followed by a quartz probe; a heated filter box (225° - 275°F) containing a 47 mm diameter quartz fiber (non-binded) filter in a glass holder and a 5/8" OD Teflon tube connecting the condensate portion of the sampling train.

The condensate portion of the sampling train consists of a series of seven impingers; the first impinger is empty, the second and third each contains 100 mls of 5% HNO_3/10% H_2O_2 solution; the fourth is empty; the fifth and six contain 100 ml of 4% $KMnO_4$/10% H_2SO_4, and the seventh contain approximately 200 grams of silica gel. The second impinger is the standard Greenburg Smith impinger with all others being the modified type. All impingers are connected with leak-free ground glass fittings and glass U-bends.

An umbilical cord connects the last impinger to the flow control console consist of a leakless, lubricated vane pump, dry gas meter and calibrated orifice. Flow rate is monitored using a calibrated magnahelic gauge. A leak check of the pitot tube lines and sampling trains is conducted prior to and after each sampling run and prior to and after either changing any of the constituents of the train or changing sample ports. Upon completion of the sampling run and post test leak check, the sample train is recovered according to the following procedures:

1. Container One: The probe, sample nozzle and front half of the filter housing is rinsed with 0.1 N nitric acid into a 500 ml Nalgene container.

2. Container Two: The quartz-fiber filter is removed and replaced in its original petri dish. The petri dish is labeled and sealed with Teflon tape.

3. Container Three: After volumetrically measuring the condensate volume, impingers one, two and three are collected into one liter Nalgene containers. Each impinger and all connecting glassware is rinsed with 0.1 N nitric acid. This rinse is combined with the impinger condensate. The container(s) are sealed, labeled and taped with all liquid levels marked.

4. Container Four: After volumetrically measuring the condensate volume, impinger four is rinsed with 0.1 N nitric acid into container #4 which was sealed with Teflon tape and labeled.

5. Container Five: After volumetrically measuring the condensate volume, impingers five and six, containing $KMnO_4$, is collected in 1 liter amber glass bottle(s). Each impinger and all connecting glassware is rinsed with 4% $KMnO_4$. The rinse is added to the condensate sample. The sample container(s) are sealed, labeled and taped with all liquid levels marked.

6. Container Six: The silica gel are recovered into its original bottle and the moisture gain determined gravimetrically.

Metal species concentration is determined using CARB Method 436/EPA 6010B. Blanks of all solutions used in the sample train and for sample recovery and a blank train were obtained and analyzed in the exact same manner as the samples.

4.2.4 Formaldehyde

Formaldehyde emissions were determined in accordance with CARB Method 430 "Determination of Formaldehyde Emissions from Stationary Sources" as described in Appendix A. In this method stack gas is withdrawn form the stack through a series of midget impingers containing a aqueous acidic solution of 2,4-dinitrophenol-hydrazine (DNPH) solution (used within 48 hours of preparation). Aldehydes react with DNPH by nucleophilic addition on the carbonyl followed by 1,2 elimination of water and the formulation of 2,4 dinitrophenol hydrazone.

Stack gases were withdrawn from a single traverse point through a quartz probe followed by a Teflon sample line. Following the probe are three glass midget impingers. The first two impingers contain 10 ml of 0.05% DNPH/2N HCL reagent; the third impinger contains a weighed amount of silica gel.

An umbilical cord is connected between the last impinger and the flow control system. The control system consisted of a vane pump, dry gas meter, a calibrated orifice and a rotometer. The sample flow was maintained at approximately 0.5 liter per minute throughout the test run as indicated on the rotometer. The sample rate was checked three times prior to and at the conclusion of each test run using a primary standard (bubble meter). All sample flow rates were adjusted to standard conditions. The impingers were kept on ice during sampling to maintain a sample temperature of less than 60°F at the last impinger.

A leak check of the sampling train is conducted prior to each test run by plugging the probe tip and turning on the sampling pump. If the rotometer indicates no flow, the sample system is deemed leak-free. Upon completion of the test run the sample line is rinsed with 2 ml of impinger solution into the first impinger. The sample line is then rinsed with 1 ml of reagent water into the first impinger. The impinger contents are then rinsed into a leak tight septum vial which is weighed and refrigerated pending analysis.

Prior to field sampling, four reagent blanks of each impinger solution batch was analyzed to verify anticipated reagent blank levels. In addition, three field blanks were carried through all the required steps for sample preparation and analysis. A field blank consists of an impinger and sample line which is similar to a sampling impinger. One field spike was also conducted as specified in Method 430.

4.2.5 Hexavalent and Total Chromium

Horizon determined hexavalent and total chromium emissions in accordance with CARB Method 425 procedures as described in Appendix A at the flare exhaust. In this method, stack gas is withdrawn isokinetically from the stack through a series of impingers containing 0.1 N NaOH solution, and a Teflon filter. Chromium aerosol is subsequently collected in solution and on the filter. Aliquots of the collected sample are analyzed for hexavalent chromium and total chromium using ion chromatography (IC) and atomic absorption spectrophotometry (AAS), respectively.

Horizon uses a sampling train which conforms to CARB Method 425 specifications. Stack gases are isokinetically withdrawn from each traverse point through a quartz buttonhook nozzle and quartz probe. A thermocouple and pitot tube are connected to the probe per CARB Method 425.

Following the probe is a four foot 3/8" OD Teflon line and four glass impingers. The first two are of the Greenburgh-Smith design with the last two of the modified design. The first two impingers contain 100 ml of 0.1 N NaOH; the third is empty; the fourth contains a preweighed amount of silica gel.

A 47 mm Teflon filter (0.3m) contained in a glass housing is placed between the third and fourth impinger. An umbilical cord is connected between the last impinger and the flow control console. The control console consists of a leakless, lubricated vane pump, dry gas meter, calibrated orifice, and a 0-0.25 inch magnahelic gauge. The impingers are kept on ice during sampling to maintain a sample temperature of less than 60°F at the last impinger.

A leak check of the pitot tube lines and sampling train was conducted prior to and at the conclusion of each test run. Upon completion of the test run, the nozzle and probe are rinsed in a sample bottle. The connective glassware and the impingers are rinsed with 0.1N NaOH into a second acid washed container. The Teflon filter is added to the impinger condensate/rinse sample. All sample bottles are sealed with Teflon tape and all liquid levels marked. Samples are stored in ice pending analyses.

Analyses is conducted for hexavalent chromium using the IC method as described in Method 425. Total chromium is analyzed using the AAS graphite furnace method.

A blank train was set up and analyzed in the exact same manner as the sample trains. Blanks (reagent blanks) of all filters and solutions were obtained and analyzed in the same manner as the samples.

4.2.6 Hydrogen Chloride/Hydrogen Fluoride

Horizon used a sampling train which conformed to CARB Method 421 specifications with one exception: the heated filter was eliminated from the sample train since large particulate (>0.5 micron) matter was not present (the filter is not analyzed in Method 421). A description of CARB Method 421 is provided in Attachment A. Also, sample was withdrawn non-isokinetically from the source at a flow rate at approximately 0.75 cfm since water droplets were not present in the flare exhaust.

Stack gases were withdrawn through a quartz buttonhook nozzle and a quartz probe from the center of the stack. Following the probe are four glass impingers. The first, third and fourth are of the modified Greenburgh-Smith design, and the second is a standard type. Impingers one and two contain 100 milliliters of freshly prepared 3.0 mN sodium bicarbonate/2.4 mN sodium carbonate solution, respectively. The last contains a preweighed amount of silica gel. An umbilical cord connects the last impinger to the flow control console containing a leakless, lubricated vane pump, dry gas meter, calibrated orifice, and a zero to five inch magnahelic.

All glassware is cleaned by rinsing with sodium hydroxide, tap water and finally deionized water before use in the test program. A leak check of the pitot tube lines and sampling trains is conducted prior to and after each sampling run. Upon completion of each sampling run, the nozzle is removed. The nozzle and probe are brushed and rinsed with deionized water into a 500 ml amber glass container.

The contents of the impingers are poured into preweighed, precleaned, 500 ml amber glass bottles. The bottles are weighed to determine the amount of moisture trapped. All impingers and connecting glassware is rinsed with deionized water and added to the condensate sample. The silica gel is then weighed to determine the moisture gain. The samples are then analyzed for hydrogen chloride (HCl) and hydrogen fluoride (HF) using an ion chromatography operated in the anion mode.

4.2.7 Speciated VOC's (SCAQMD Rule 1150.1 List) Including 1,1,2,2-Tetrachloroethane, Acrylonitrile, 1,4-Dioxane, and 1,2-Dibromoethane

Speciated VOC emissions were determined from Tedlar bag samples using the evacuated lung procedure outlined in Appendix A. All samples were analyzed using GC/MS techniques for each compound of interest.

4.2.8 1,3 Butadiene

Horizon used the Tedlar bag procedures Method 422.102, Appendix C. The primary concern with this Method is "rapid" degradation of the 1,3 butadiene prior to analyses. To minimize this problem, Horizon delivered the sample(s) to the laboratory immediately after collection to ensure that they were analyzed within four hours of collection.

Three test runs were completed. After the third test run, samples (including one blank) were delivered to the laboratory. All subsequent samples were analyzed using a GC equipped with a flame ionization detector (FID).

5. RESULTS DISCUSSION

The following subsections present and discuss the results of the criteria and air toxic compound testing program.

5.1 Criteria Pollutants

Three replicate test runs were conducted for each criteria compound of interest. The results of the criteria testing program are provided in Table 5-1.

5.2 Air Toxic Compounds

The following subsections present and discuss the results of the air toxics compound testing.

5.2.1 Speciated Volatile Organic Compounds (VOC's) Including 1,3 Butadiene

The results of each of the three speciated VOC flare test runs (inlet and outlet) are provided in Tables 5-2, 5-3 and 5-4, respectively. Results of the 1,3 butadiene testing at the flare exhaust are also included in Tables 5-2, 5-3 and 5-4. No sampling or analytical problems were encountered during the VOC testing.

5.2.2 Polycyclic Aromatic Hydrocarbons, Including Hexachlorobenzene

The results of each four-hour PAH test run is provided in Table 5-5. No sampling or analytical problems were encountered during the PAH testing.

One PAH/hexachlorobenzene blank train was collected and analyzed with the sample set. The results of these blanks and other QA/QC results are provided in Section 6.

Table 5-1
Summary of Results
Criteria Pollutants
Simi Valley Landfill Flare #2
October 2005

	LANDFILL GAS			FLARE EXHAUST		
	Run #1	Run #2	Run #3	Run #1	Run #2	Run #3
STACK GAS CHARACTERISTICS						
Temperature (°F)	----	----	----	1614	1636	1691
Moisture (%)	5.6	5.7	4.8	8.2	9.0	9.9
Flow Rate (acfm)	----	----	----	82243	80692	82388
(dscfm)*	2055	2055	2072	18364	17674	17474
Fixed Gases						
Methane (%)	46.85	48.17	47.74	<0.0001	<0.0001	<0.0001
Oxygen (%)	0.94	0.56	0.63	11.92	11.64	11.23
Carbon Dioxide (%)	37.97	38.68	38.55	8.10	8.33	8.63
Nitrogen	13.62	12.01	12.51	79.98	80.03	80.14
Heating Value, Btu/dscf	484	497	492	----	----	----
MMBtu/hr	59.68	61.28	61.17	----	----	----
EMISSIONS						
Oxides of Nitrogen						
ppm	----	----	----	12.4	13.0	15.8
ppm @ 3% O_2	----	----	----	24.7	25.1	29.2
lb/hr	----	----	----	1.65	1.67	2.01
lb/MMBtu	----	----	----	0.0334	0.0339	0.0394
Carbon Monoxide						
ppm	----	----	----	2.33	1.36	1.00
ppm @ 3% O_2	----	----	----	4.64	2.63	1.85
lb/hr	----	----	----	0.189	0.106	0.077
lb/MMBtu	----	----	----	0.0038	0.0022	0.0015
Reactive Organic Compounds						
ppm (as CH_4)	6110	5780	5720	1.65	1.38	2.00
lb/hr (as CH_4)	31.8	30.0	30.0	0.0766	0.0617	0.0884
destruction efficiency (%)	----	----	----	99.8	99.8	99.7
Sulfur Dioxide						
lb/hr	----	----	----	0.985	1.083	1.134
lb/MMBtu	----	----	----	0.0165	0.0176	0.0185

* The flow rate (scfm) as measured using the facility's calibrated on-line landfill gas flow rate monitor.

Table 5-1 (Cont.)
Summary of Results
Simi Valley Landfill Flare #2
October 2005

	LANDFILL GAS			FLARE EXHAUST		
	Run #1	Run #2	Run #3	Run #1	Run #2	Run #3
Sulfur Compounds						
hydrogen sulfide (ppm)	35.4	39.3	41.1	----	----	----
grains/100 ft^3	2.22	2.46	2.58			
methyl mercaptan (ppm)	3.72	4.04	4.17	----	----	----
grains/100ft^3	0.307	0.334	0.344			
ethyl mercaptan (ppm)	<0.1	<0.1	<0.1	----	----	----
grains/100ft^3	<0.01	<0.01	<0.01			
dimethyl sulfide (ppm)	6.35	6.72	6.86	----	----	----
grains/100ft^3	0.736	0.780	0.796			
carbonyl sulfide (ppm)	0.32	0.31	0.32	----	----	----
grains/100ft^3	0.035	0.034	0.035			
carbon disulfide (ppm)	0.19	0.20	0.20	----	----	----
grains/100ft^3	0.020	0.021	0.021			
dimethyl disulfide (ppm)	0.22	0.23	0.19	----	----	----
grains/100ft^3	0.041	0.043	0.035			
Total Sulfur Compounds (ppm, as H_2S)	47.33	52.01	54.01	----	----	----
grains/100 ft^3	2.98	3.27	3.40			

Table 5-2
Trace Organic Species
Destruction Efficiency Results
Simi Valley Landfill
Flare #2 (John Zink)
October 12, 2005
Run 1

Species	Inlet		Outlet		Destruction Efficiency (%)
	Concentration (ppb)	Emission Rate (lb/hr)	Concentration (ppb)	Emission Rate (lb/hr)	
Hydrogen Sulfide	35400	3.92E-01	< 50	< 4.95E-03	> 98.74
Benzene	1940	4.92E-02	1.06	2.40E-04	99.51
Benzychloride	< 40	< 1.65E-03	< 0.8	< 2.95E-04	NA
Chlorobenzene	110	4.04E-03	< 0.3	< 9.84E-05	> 97.56
Dichlorobenzenes	816	3.90E-02	< 1.1	< 4.69E-04	> 98.80
1,1-dichloroethane	393	1.26E-02	< 0.3	< 8.62E-05	> 99.32
1,2-dichloroethane	179	5.76E-03	< 0.3	< 8.62E-05	> 98.50
1,1-dichloroethylene	74.8	2.36E-03	< 0.3	< 8.45E-05	> 96.42
Dichloromethane	1550	4.28E-02	4.24	1.05E-03	97.56
1,2-dibromoethane	< 30	< 1.83E-03	< 0.3	< 1.64E-04	NA
Perchloroethene	1780	1.37E-01	< 0.2	< 1.38E-04	> 99.90
Carbon tetrachloride	< 30	< 1.50E-03	< 0.2	< 8.94E-05	NA
Toluene	37800	1.13E+00	1.46	3.90E-04	99.97
1,1,1-trichloroethane	36	1.54E-03	< 0.2	< 7.72E-05	> 94.99
Trichloroethene	761	3.24E-02	< 0.2	< 7.61E-05	> 99.77
Chloroform	< 20	< 7.73E-04	< 0.2	< 6.91E-05	NA
Vinyl Chloride	494	1.00E-02	< 0.3	< 5.44E-05	> 99.46
m xylenes	15800	5.44E-01	1.06	3.26E-04	99.94
o+p xylene	5280	1.82E-01	0.43	1.32E-04	99.93
TNMHC	6110000	3.18E+01	1650	7.66E-02	99.76
Acrylonitrile	< 200	< 3.45E-03	< 2.0	< 3.08E-04	NA
1,3-butadiene	NM	NM	< 1.0	< 1.69E-04	NA
1,1,2,2-Tetrachloroethane	< 30	< 1.64E-03	< 0.3	< 1.46E-04	NA

Note: All values preceded by "<" are below the detection limit - reported values are detection limit values.
NA--Not applicable: Destruction efficiency cannot be calculated since both inlet and outlet values are below the detection limit.

Table 5-3
Trace Organic Species
Destruction Efficiency Results
Simi Valley Landfill
Flare #2 (John Zink)
October 12, 2005
Run 2

Species	Inlet		Outlet		Destruction Efficiency (%)
	Concentration (ppb)	Emission Rate (lb/hr)	Concentration (ppb)	Emission Rate (lb/hr)	
Hydrogen Sulfide	39300	4.35E-01	< 50	< 4.76E-03	> 98.91
Benzene	2010	5.09E-02	0.92	2.00E-04	99.61
Benzychloride	< 40	< 1.65E-03	< 0.8	< 2.84E-04	NA
Chlorobenzene	114	4.19E-03	< 0.3	< 9.47E-05	> 97.74
Dichlorobenzenes	898	4.29E-02	< 1.1	< 4.52E-04	> 98.95
1,1-dichloroethane	408	1.31E-02	< 0.3	< 8.30E-05	> 99.37
1,2-dichloroethane	184	5.92E-03	< 0.3	< 8.30E-05	> 98.60
1,1-dichloroethylene	76.6	2.41E-03	< 0.3	< 8.13E-05	> 96.63
Dichloromethane	1600	4.42E-02	5.11	1.21E-03	97.25
1,2-dibromoethane	< 30	< 1.83E-03	< 0.3	< 1.57E-04	NA
Perchloroethene	1860	1.43E-01	< 0.2	< 1.32E-04	> 99.91
Carbon tetrachloride	< 30	< 1.50E-03	< 0.2	< 8.61E-05	NA
Toluene	38800	1.16E+00	0.87	2.24E-04	99.98
1,1,1-trichloroethane	36.7	1.59E-03	< 0.2	< 7.43E-05	> 95.31
Trichloroethene	801	3.41E-02	< 0.2	< 7.32E-05	> 99.79
Chloroform	< 20	< 7.73E-04	< 0.2	< 6.65E-05	NA
Vinyl Chloride	498	1.01E-02	< 0.3	< 5.24E-05	> 99.48
m xylenes	16600	5.72E-01	0.52	1.54E-04	99.97
o+p xylene	5610	1.93E-01	< 0.2	< 5.92E-05	> 99.97
TNMHC	5780000	3.00E+01	1380	6.17E-02	99.79
Acrylonitrile	< 200	< 3.45E-03	< 2.0	< 2.97E-04	NA
1,3-butadiene	NM	NM	< 1.0	< 1.62E-04	NA
1,1,2,2-Tetrachloroethane	< 30	< 1.64E-03	< 0.3	< 1.41E-04	NA

Note: All values preceded by "<" are below the detection limit - reported values are detection limit values.
NA--Not applicable: Destruction efficiency cannot be calculated since both inlet and outlet values are below the detection limit.

Table 5-4
Trace Organic Species
Destruction Efficiency Results
Simi Valley Landfill
Flare #2 (John Zink)
October 13, 2005
Run 3

Species	Inlet		Outlet		Destruction Efficiency (%)
	Concentration (ppb)	Emission Rate (lb/hr)	Concentration (ppb)	Emission Rate (lb/hr)	
Hydrogen Sulfide	41100	4.59E-01	< 50	< 4.71E-03	> 98.97
Benzene	1940	4.96E-02	1.45	3.12E-04	99.37
Benzychloride	< 40	< 1.66E-03	< 0.8	< 2.81E-04	NA
Chlorobenzene	116	4.29E-03	< 0.3	< 9.36E-05	> 97.82
Dichlorobenzenes	897	4.32E-02	< 1.1	< 4.47E-04	> 98.97
1,1-dichloroethane	401	1.30E-02	< 0.3	< 8.20E-05	> 99.37
1,2-dichloroethane	177	5.74E-03	< 0.3	< 8.20E-05	> 98.57
1,1-dichloroethylene	71.2	2.26E-03	< 0.3	< 8.04E-05	> 96.45
Dichloromethane	1660	4.62E-02	3.83	8.99E-04	98.05
1,2-dibromoethane	< 30	< 1.85E-03	< 0.3	< 1.56E-04	NA
Perchloroethene	1810	1.41E-01	< 0.2	< 1.31E-04	> 99.91
Carbon tetrachloride	< 30	< 1.51E-03	< 0.2	< 8.51E-05	NA
Toluene	38900	1.17E+00	1.69	4.30E-04	99.96
1,1,1-trichloroethane	34.3	1.49E-03	< 0.2	< 7.35E-05	> 95.08
Trichloroethene	775	3.33E-02	< 0.2	< 7.24E-05	> 99.78
Chloroform	< 20	< 7.80E-04	< 0.2	< 6.57E-05	NA
Vinyl Chloride	473	9.69E-03	< 0.3	< 5.18E-05	> 99.47
m xylenes	16400	5.70E-01	1.12	3.28E-04	99.94
o+p xylene	5450	1.89E-01	0.42	1.23E-04	99.94
TNMHC	5720000	3.00E+01	2000	8.84E-02	99.71
Acrylonitrile	< 200	< 3.48E-03	< 2	< 2.93E-04	NA
1,3-butadiene	NM	NM	< 1.0	< 1.60E-04	NA
1,1,2,2-Tetrachloroethane	< 30	< 1.65E-03	< 0.3	< 1.39E-04	NA

Note: All values preceded by "<" are below the detection limit - reported values are detection limit values.
NA--Not applicable: Destruction efficiency cannot be calculated since both inlet and outlet values are below the detection limit.

Table 5-5
PAH Emission Results - Flare #2 (John Zink Flare)
Simi Valley Landfill
October 2005

	Run #1	Run #2	Run #3
Stack Gas Characteristics			
Temperature, F	1656	1577	1636
Moisture, %	7.9	7.6	7.9
Fixed Gases,			
CO2, %	7.1	6.6	6.1
O2, %	13.5	13.9	15.0
N2, %	79.4	79.5	78.9
Flow rate			
dscfm	16925	17295	16996
acfm	75451	74160	75384

	Run #1		Run #2		Run #3	
	Conc. @ 12 % CO2	Emission Rate	Conc. @ 12 % CO2	Emission Rate	Conc. @ 12 % COm	Emission Rate
PAH Emissions	(ug/dscm)	(lb/hr)	(ug/dscm)	(lb/hr)	(ug/dscm)	(lb/hr)
Napthalene	0.1092	4.10E-06	0.0913	3.25E-06	0.1708	5.53E-06
2-Methylnaphthalene	0.0277	1.04E-06	0.0308	1.10E-06	0.0755	2.44E-06
Acenaphthalene	< 0.0059	< 2.20E-07	< 0.0063	< 2.24E-07	0.0101	3.27E-07
Acenaphthene	< 0.0059	< 2.20E-07	< 0.0063	< 2.24E-07	0.0118	3.83E-07
Fluorene	0.0074	2.79E-07	0.0082	2.93E-07	0.0460	1.49E-06
Phenanthrene	0.0352	1.32E-06	0.0317	1.13E-06	0.2384	7.72E-06
Anthracene	< 0.0059	< 2.20E-07	< 0.0063	< 2.24E-07	0.0169	5.46E-07
Fluoranthene	0.0179	6.72E-07	0.0083	2.96E-07	0.0556	1.80E-06
Pyrene	0.0162	6.08E-07	0.0075	2.68E-07	0.0220	7.12E-07
Benz(a)anthracene*	< 0.0059	< 2.20E-07	< 0.0063	< 2.24E-07	< 0.0069	< 2.22E-07
Chrysene*	0.0068	2.57E-07	0.0063	2.24E-07	< 0.0069	< 2.22E-07
Benzo(b)fluoranthene*	< 0.0059	< 2.20E-07	< 0.0063	< 2.24E-07	0.0077	2.49E-07
Benzo(k)fluoranthene*	< 0.0059	< 2.20E-07	< 0.0063	< 2.24E-07	< 0.0069	< 2.22E-07
Benzo(e)pyrene*	< 0.0059	< 2.20E-07	< 0.0063	< 2.24E-07	< 0.0069	< 2.22E-07
Benzo(a)pyrene*	< 0.0059	< 2.20E-07	< 0.0063	< 2.24E-07	< 0.0069	< 2.22E-07
Pyryloene*	< 0.0059	< 2.20E-07	< 0.0063	< 2.24E-07	< 0.0069	< 2.22E-07
Benzo(g,h,i)perylene*	< 0.0059	< 2.20E-07	< 0.0063	< 2.24E-07	< 0.0069	< 2.22E-07
Dibenz(a,h)anthracene*	< 0.0059	< 2.20E-07	< 0.0063	< 2.24E-07	< 0.0069	< 2.22E-07
Indeno[1,2,3-cd]pyrene*	< 0.0059	< 2.20E-07	< 0.0063	< 2.24E-07	< 0.0069	< 2.22E-07
Hexachlorobenzene	0.0001	4.96E-09	0.0001	5.17E-09	0.0005	1.71E-08
Total PAH	0.2911	1.09E-05	0.2596	9.25E-06	0.7169	2.32E-05
Total PAH w/o Napthalene	0.1819	6.82E-06	0.1683	6.00E-06	0.5461	1.77E-05
Total Carcinogenic PAH	0.0598	2.24E-06	0.0629	2.24E-06	0.0700	2.26E-06

< - Below Quantifiable Limit. Reported values are based upon the lowest quantifiable limit.

* denotes carcinogenic species.

5.2.3 Formaldehyde

The results of each of the three, 8-hour aldehyde test runs are provided in Table 5-6. Since the sample concentrations were less than 5 times the average blank concentration, the reported emission rates are based upon five times the average blank concentration and are reported as "less than" values. For a more complete discussion of the additional QA/QC results of the aldehyde sampling see Section 6.

5.2.4 Hydrochloric and Hydrofluoric Acid (HCl/HF)

The results of the HCl/HF testing are provided in Table 5-7. No sampling or analytical problems were encountered during any phase of the testing.

5.2.5 Multimetals

The results of the three multimetals test runs are reported in Table 5-8. Reported values are not blank corrected. No sampling or analytical problems were encountered during the testing program.

One blank train were processed with the sample set. Detectable amounts of some metals were found in the blank samples. The results of the blank samples are discussed in more detail in Section 6.

5.2.6 Total/Hexavalent Chromium

Chromium testing was completed on October 19, 20 and 21. However, due to a laboratory error (the samples were acidified prior to hexavalent chromium analyses),the samples were rendered invalid. The chromium sampling was repeated on November 21 and 22,2005. The results of the valid chromium testing conducted on November 21 and 22 are provided in Table 5-9.

The results of the field blanks and blank trains were below the detection limit for both total and hexavalent chromium. A more complete summary of the QA/QC results are provided in Section 6.

Table 5-6

Formaldehyde Emissions
Simi Valley Landfill Flare #2
October 2005

	Run 1	Run 2	Run 3
Stack Gas Characteristics*			
Temperature (°F)	1656	1577	1636
Moisture (%)	7.9	7.6	7.9
Flow Rate			
(dscfm)	16925	17295	16996
(acfm)	75451	74160	75384
Fixed Gases			
O_2 (%)	13.5	13.9	15.0
CO_2 (%)	7.1	6.6	6.1
N_2 (%)	79.4	79.5	78.9
Formaldehyde Emissions			
(ppb)	< 4.7	< 4.7	< 4.7
(lb/hr)	< 0.0004	< 0.0004	< 0.0004

* Stack gas characteristics taken from concurrent CARB Method 429 sampling.
** Reported values are based upon 5 times the blank concentration (see text).

Table 5-7

Hydrochloric and Hydrofluoric Acid Emissions
Simi Valley Landfill Flare #2
October 2005

	Run 1	Run 2	Run 3
Stack Gas Characteristics*			
Temperature (°F)	1656	1577	1636
Moisture (%)	8.7	8.3	7.7
Flow Rate			
(dscfm)	16925	17295	16996
(acfm)	75451	74160	75384
Fixed Gases			
O_2 (%)	13.5	13.9	15.0
CO_2 (%)	7.1	6.6	6.1
N_2 (%)	79.4	79.5	78.9
Acid Gas Emissions			
Hydrochloric Acid			
(mg/dscf)	0.105	0.103	0.109
(lb/hr)	0.24	0.23	0.24
Hydrofluoric Acid,			
(mg/dscf)	0.052	0.049	0.052
(lb/hr)	0.117	0.109	0.118

* Stack gas characteristics taken from concurrent CARB Method 429 sampling.

Table 5 - 8
Summary of Results
Stack Gas Characteristics - Metals Emissions
Flare #2 (John Zink)

Run Number	******	1	2	3	
Date	******	10/12/05	10/12/05	10/13/05	
Run Start Time	******	822	1204	942	
Run End Time	******	1125	1402	1142	
Stack Gas Characteristics					**Average**
Stack Temperature	F	1614	1636	1691	1647
Moisture	%	8.2	9.0	9.9	9.1
Fixed Gases,					
CO 2	%	8.1	8.3	8.6	8.4
O 2	%	11.9	11.6	11.2	11.6
N 2	%	80.0	80.0	80.1	80.1
Stack Velocity	afpm	920	903	922	915
Volumetric Flow Rate	dscfm	18364	17674	17474	17837
Volumetric Flow Rate	acfm	82243	80692	82388	81774
Isokinetic Ratio	%	94	97	104	98
Metals Emissions					
ARSENIC*	lb/hr	1.94E-05	2.44E-05	2.51E-05	2.29E-05
CADMIUM*	lb/hr	1.58E-05	1.39E-05	1.16E-05	1.38E-05
COPPER	lb/hr	8.05E-04	5.36E-05	4.11E-05	3.00E-04
MANGANESE*	lb/hr	3.27E-05	7.31E-05	1.53E-04	8.62E-05
MERCURY*	lb/hr	3.27E-05	2.92E-05	1.96E-05	2.72E-05
NICKEL*	lb/hr	< 2.77E-05	< 2.68E-05	7.07E-05	4.17E-05
ZINC	lb/hr	1.38E-04	3.17E-04	2.51E-04	2.35E-04
Total	lb/hr	1.07E-03	5.37E-04	5.72E-04	7.27E-04
*Total HAPS	lb/hr	1.28E-04	1.67E-04	2.80E-04	1.92E-04

Values preceded by "<" are below the quantifiable limit. Actual values are less than those repor

*Hazardous Air Pollutants (HAPS)

Table 5-9

Total/Hexavalent Chromium Emissions
Simi Valley Landfill Flare #2
November 2005

	Run 1	Run 2	Run 3
Stack Gas Characteristics,			
Temperature (°F)	1685	1713	1643
Moisture (%)	8.3	8.2	7.2
Flow Rate,			
dscfm	15046	14875	15315
acfm	66783	66846	66043
Fixed Gases,			
O_2 (%)	14.5	11.4	14.8
CO_2 (%)	6.0	8.9	6.0
N_2 (%)	79.5	79.7	79.2
Chromium Emissions,			
Total Chromium,			
µg/dscf	6.7×10^{-6}	5.3×10^{-6}	5.4×10^{-6}
lb/hr	1.34×10^{-5}	1.05×10^{-5}	1.09×10^{-5}
Hexavalent Chromium,			
µg/dscf	$< 2.0 \times 10^{-6}$	$< 2.0 \times 10^{-6}$	2.0×10^{-6}
lb/hr	$< 3.16 \times 10^{-6}$	$< 3.15 \times 10^{-6}$	3.18×10^{-6}

Note: All values preceded by "<" are below the detection limit. Reported results are based upon detection limit values. Variability in detection limit value is due to variability in the sample volume.

6. QA/QC SUMMARY

All QA/QC requirements of each respective Method were adhered to throughout the testing program. Also, the guidelines of Horizon's corporate QA/QC manual, as appearing in the Test Plan, were followed by all sampling and analytical personnel. In addition, QA/QC measures taken which were beyond their respective Method requirements were incorporated into the testing program and are discussed in detail herein.

6.1 Continuous Emission Monitoring (CEM) - EPA Method 7E/10/3A

All CEM system performance checks, as detailed in Section 3, were within specifications including analyzer linearity, calibration drift, leak checks and system bias checks. The on-site CEM system performance checks can be found in Appendix A.

6.2 1,3 Butadiene

The 1,3 butadiene samples were analyzed within approximately four hours after collection of the last sample.

6.3 Speciated Volatile Organic (VOC) Compounds

Replicate analyses were performed for all detected VOC species. All replicate analyses agreed to within 10 percent of the mean concentration (Appendix B).

6.4 Polycyclic Aromatic Hydrocarbons (PAH's) Including Hexachlorobenzene

Prior to use in the sampling program all XAD resin was verified to be of sufficient cleanliness for purposes of the test program. All Method blanks displayed PAH concentrations below the quantifiable limit with the exception of naphthalene and 2-methylnaphthalene. All laboratory spikes recoveries were within the acceptable limits of Method 429.

All sample isotopic spike recovery was within +50% as required in the Method. One blank train was processed with the sample set for PAH analyses. All PAH concentrations were below the detectable limit for the field blank sample.

6.5 Aldehydes

All CARB Method 430 QA/QC procedures were strictly adhered to including the following:

- Pre-testing (4 samples) of DNPH solution.
- Complete extraction of DNPH solution within nine days of reagent blank analyses.
- Analyses completed within 39 days after reagent blank analyses.
- Three field blanks were obtained.
- A field spike analyses was performed.
- A sample matrix spike analyses was performed.
- Replicate sample analyses.

The matrix spike yielded the following results:

	Theoretical (µg)	Measured (µg)	Recovery (%)
Formaldehyde	0.78	0.84	108

The field spike yielded the following results:

	Theoretical (µg)	Measured (µg)	Recovery (%)
Formaldehyde	117	120	102

The agreement between replicate analyses was 0.1% from the mean for formaldehyde.

6.6 HCl/HF

One field blank was processed for HCl/HF analyses. The field blank value was below the detection limit for both HF and HC1. All laboratory control and sample spike recoveries were within the 80% to 120 % control limits.

6.7 Multimetals

In addition to all laboratory QA/QC samples, a blank train was analyzed with the set of multimetals samples as required by CARB Method 436. Three metal species were above the detection limit in the blank train. These compounds are as follows:

Copper	1.2	µg/sample
Cadmium	0.59	µg/sample
Manganese	0.70	µg/sample

All sample matrix spike recovered were within the requirements of CARB Method 436.

6.8 Total/Hexavalent Chromium

In addition to laboratory QA/QC samples, one field blank and one blank train, as required by CARB Method 425, were analyzed with the set of samples.

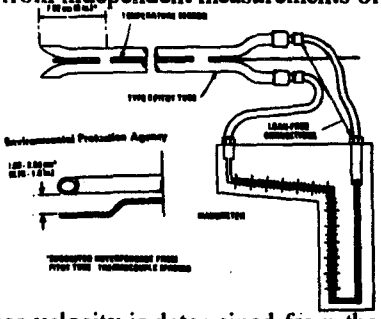
Both the field blank and blank train values were below the detection limit for total and hexavalent chromium (Appendix B).

APPENDIX A - Test Method Descriptions

Method:	**Sample Velocity Traverses for Stationary Sources**
Applicable for Methods:	EPA Method 1, SCAQMD Method 1.1, CARB Method 1
Principle:	To aid in the representative measurements of pollutant emissions and/or total volumetric flow rate from a stationary source, a measurement site where the effluent stream is flowing in a known direction is selected, and the cross section of the stack is divided into a number of equal areas. A traverse point is then located within these equal areas. The method cannot be used when, 1) flow is cyclonic or swirling, 2) stack is small than about 0.30 meter (12 inches) in diameter or 3) the measurement of the site is less than two stack or duct diameters downstream or less than a half diameter upstream from the flow disturbance.

002

Method:	**Stack Gas Velocity and Volumetric Flow Rate**
Applicable for Methods:	EPA Method 2, CARB 2, SCAQMD Method 2.1
Principle:	The average gas velocity in a stack gas is determined from the gas density and from measurement of the average velocity head with a type S or standard pitot tube.
Sampling Procedure:	Set up the apparatus as shown in the figure. Measure the velocity head and temperature at the traverse points specified by EPA Method 2, CARB Method 2 or SCAQMD Method 2.1. Measure the static pressure in the stack and determine the atmospheric pressure. The stack gas molecular weight is determined from independent measurements of O_2, CO_2 and H_2O concentrations.



Sample Recovery: and Analyses:	The stack gas velocity is determined from the measured average velocity head, the measured dry concentrations of O_2 and CO_2 and the measured concentration of H_2O. The velocity is determined from the following set of equations:

Where,

ΔP = velocity head, inches in H_2O	Mwd = dry molecular weight
Ts = gas/temperature, degrees R	Mw = molecular weight
Ps = absolute static pressure	Cp = pitot flow coefficient

Dry molecular weight of stack gas

$$Mwd = 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%N_2 + \%CO)$$

Molecular weight of stack gas, wet basis

$$M_w = (M_{wd}\ x\ M_d) + 18\ (1 - M_d)$$

$$Where,\ M_d = \frac{100 - Bws}{100}$$

Stack gas velocity

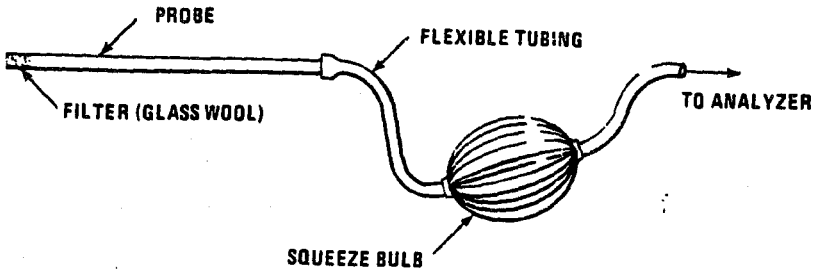
$$(V_s)\ avg. = (5130)\ C_p\ x\ \sqrt{\Delta P}\ avg.\ x\ \sqrt{T_s}\ x\ \left(\frac{1}{P_s\ x\ M_w}\right)^{1/2}$$

Method: **Gas Analysis for Dry Molecular Weight and Excess Air**

Applicable for Methods: EPA Method 3, SCAQMD Method 3.1, CARB Method 3

Sampling Procedure:

a) Single Point, Grab Sampling - set up equipment as shown in the figure. Position probe at the centroid of the stack. Purge sample line and draw sample straight to the Orsat/Dyrite analyzer and immediately analyze for percent CO_2 & O_2



b) Integrated Gas Sampling Train - set up equipment as shown in the figure. Position probe at the centroid of the stack. Purge sample line and draw sample into the Tedlar bag. Fill bag concurrent to the criteria pollutant sample, analyze samples immediately.

c) Multi-Point Integrated Sampling - set up equipment the same as b) integrated gas sampling. Follow procedures from (b) except traverse all points and sample at each point for an equal length of time.

* To determine the percentage of gas that is N_2 and CO by subtracting the sum of the percent CO_2 and percent O_2 from 100.

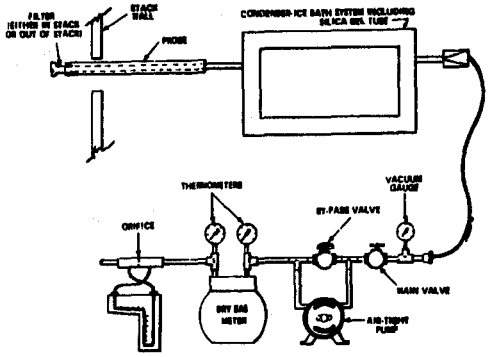
* Dry molecular weight calculation of stack gases:

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

To Remember:

The equation above does not consider argon in air (about 0.9% molecular weight of 39.9). A negative error of about 0.4 percent is introduced.

Method:	**Determination of Moisture in Stack Gases**
Applicable for Methods:	EPA Method 4, ARB 1-4, SCAQMD Method 4.1
Principle:	A gas sample is extracted at a constant rate from the source; moisture is removed from the stream and determined either volumetrically or gravimetrically.
Sampling Procedure:	Set up train as shown in the following figure. Sample is drawn at a constant rate through a sufficiently heated probe. The probe is connected to the impinger train by Teflon or glass tubing. The train consists of two greenburg smith impinger (SCAQMD 4.1) or one modified and 1 greenburg smith impinger (CARB & EPA) each containing 100 ml of water, an empty impinger as a knock-out and an impinger containing silica gel to protect the pump from moisture.



Sample Recovery: and Analyses:	Following testing, moisture content is determined gravimetrically or volumetrically from initial and final impinger contents weights or volume.

Method:	**Methane and Total Non-Methane Hydrocarbons by Total Carbon Analyses**
Reference:	EPA Method 25C
Principle:	Gaseous samples are collected in stainless steel canisters. The canisters are then pressurized with nitrogen and analyzed for methane and total non methane hydrocarbons (TNMHC) using a TCA/FID.
Sampling Procedure:	Samples are collected, in duplicate, using stainless steel canisters which are evacuated to less than 10 mm Hg absolute. The tanks are pressurized and evacuated three times with ultrapure nitrogen and leak checked prior to use. A gas flow metering device and stainless steel shutoff valve is located just upstream of the canister. Representative, integrated samples are collected through a heat conditioned 1/4" stainless steel probe. The gas samples are metered into the canisters through the vacuum regulator maintaining a constant flow rate throughout each sampling period. The sampling apparatus is checked for leaks prior to the sampling program by attaching the probe end to an absolute pressure gauge and vacuum pump in series. The sample lines were evacuated to less than 10 mm Hg and the gauge shutoff valve is then closed. The sample lines are deemed to be leak-free if no loss of vacuum occurs as indicated by the vacuum gauge. During sampling the tank pressures are monitored with a 0-30 inch vacuum gauge to ensure integrated sampling.
Analytical Procedure:	Samples are analyzed for methane and total non methane hydrocarbons (TNMHC) by total combustion analyses (TCA)/flame ionization detection (FID).

CONTINUOUS EMISSIONS MONITORING SYSTEM - TRUCK

CARB Method 100

The continuous emissions monitoring system consists of a Thermo Electron Model 10AR chemiluminescence NO/NO_X analyzer, a Teledyne electro chemical O_2 analyzer, a Thermo Electron Model 48H CO gas filter correlation analyzer and a Horiba PIR2000 non dispersive infrared CO_2 analyzer. All analyzer specifications are provided in Table 1. All concentrations are determined on a dry basis. Concentrations of NO_X, CO, O_2 and CO_2 are continuously recorded on a Linseis 10-inch strip chart recorder. The extractive monitoring system conforms with the requirements of CARB Method 100.

The sampling probe (heated to 250°F), constructed of 1/2 inch-diameter 316 stainless steel, is connected to a condenser with a six foot length of 3/8 inch Teflon line (heated to 250°F). A Nupro stainless steel filter (10 micron) is connected at the tip of the probe and maintained at stack temperature.

The condenser consists of a series of two stainless steel moisture knock-out bottles immersed in an ethylene glycol/dry ice bath. The system is designed to minimize contact between the sample and the condensate. Condensate is continuously removed from the knock-out bottles via a peristaltic pump. The condenser outlet temperature is monitored either manually at 10-minute intervals or on a strip chart recorder/DAS system. The sample exiting the condenser is then transported through a filter, housed in a stainless steel holder, followed by 3/8 inch O.D. Teflon tubing and a Teflon coated (or stainless steel/viton) diaphragm pump to the sample manifold. The sample manifold is constructed of stainless steel tubing and directs the sample through each of five rotameters to the NO_X monitor, O_2 monitor, CO monitor, CO_2 monitor and excess sample exhaust line, respectively. Sample flow through each channel is controlled by a back pressure regulator and by stainless steel needle valves on each rotameter. All components of the sampling system that contact the sample are composed of stainless steel, Teflon or glass.

The calibration system is comprised of two parts: the analyzer calibration and the system bias check. The calibration gases are, at a minimum, certified to ± 1% by the manufacturer. Where necessary to comply with the reference method requirements, EPA Protocol 1 gases are used. The cylinders are equipped with pressure regulators which supply the calibration gas to the analyzers at the same pressure and flow rate as the sample. The selection of zero, span or sample gas directed to each analyzer is accomplished by operation of the zero, calibration or sample selector knobs located on the main flow control panel.

For CARB Method 100 the following procedures are conducted before and after each series of test runs:

Leak Check:

The leak check is performed by plugging the end of the sampling probe, evacuating the system to at least 20 inches of Hg. The leak check is deemed satisfactory if the system holds 20 inches of Hg vacuum for five minutes with less than one inch Hg loss.

Alternately the leak check is accomplished by plugging the probe at the tip and operating the system in the "sample" position. The excess sample vent is closed and the flow observed on the low-flow (0-140 cc/min) sample delivery system. If no flow is observed the system is deemed leak tight.

Pre-Test Calibration:

The NO_X analyzer calibration is performed by introducing, at a minimum, zero gas and high range calibration gas (80-100% scale). The CO analyzer calibration is performed by introducing zero gas and high range (80-100%) calibration gas. The oxygen (O_2) and carbon dioxide (CO_2) analyzer calibration is performed by introducing zero gas and high range calibration gas (80-100% of scale).

Stratification Check:

A stack stratification check is performed (pre-test only) by traversing the stack (6 points per traverse). If the gas composition is homogenous, <10% variation between any two points in the gas stream throughout the cross sectional diameter of the stacks, single point gas sampling is performed at an average point. If stratification exceeds the 10% criteria, then the stack cross section is traversed during sampling.

System Bias Check:

The system bias check is accomplished by transporting the same gases used to zero and span the analyzers to the sample system as close as practical to the probe inlet. This is accomplished by opening a valve located on the probe, allowing the gas to flow to the probe and back through the moisture knockout and sample line to the analyzers. During this check the system is operated at the normal sampling rate with no adjustments. The system bias check is considered valid if the difference between the gas concentration exhibited by the measurement system which a known concentration gas is introduced at the sampling probe tip and when the sample gas is introduced directly to the analyzer, does not exceed ± 5% of the analyzer range.

In between each sampling run the following procedures are conducted:

Analyzer Calibration:

The analyzer calibration is performed by introducing the zero and high range gases to each analyzer prior to each test run and adjusting the instrument calibration as necessary.

Zero and Calibration Drift Check:

The zero and calibration drift check is performed by introducing zero and high range calibration gases to the instruments, with no adjustments (with the exception of flow to instruments) after each test run. The analyzer response must be within ± 3% of the actual calibration gas value.

A schematic of the sample system and specific information on the analytical equipment is provided in the following pages.

TABLE 1

CONTINUOUS EMISSIONS MONITORING LABORATORY - TRUCK

NO_x CHEMILUMINESCENT ANALYZER -- THERMO ELECTRON MODEL 10 A

Response Time (0-90%)	1.5 sec -- NO mode/1.7 sec -- NO_x mode
Zero Drift	Negligible after 1/2 hour warmup
Linearity	± 1% of full scale
Accuracy	Derived from the NO or NO_2 calibration gas, ± 1% of full scale
Operating Ranges (ppm)	2.5, 10, 25, 100, 250, 1000, 2500, 10000
Output	0-1 volt

O_2 ANALYZER, FUEL TYPE -- TELEDYNE MODEL 326RA

Response Time (0-90%)	60 seconds
Accuracy	± 1% of scale at constant temperature ± 1% of scale of ± 5% of reading, whichever is greater, over the operation temperature range.
Operating Ranges (%)	0-5, 0-25, 0-100
Output	0-1 volt

O_2 ANALYZER, PARAMAGNETIC -- SERVOMEX MODEL 1400B

Response Time (0-90%)	15 seconds
Accuracy	0.1% oxygen
Linearity	± 1% scale
Operating Ranges (%)	0-25, 0-100
Output	0-1 volt

CO GAS FILTER CORRELATION -- THERMO ELECTRON MODEL 48H

Response Time (0-95%)	1 minute
Zero Drift	± 0.2 ppm CO
Span Drift	Less than 1% full scale in 24 hours
Linearity	± 1% full scale, all ranges
Accuracy	± 0.1 ppm CO
Operating Ranges (ppm)	50, 100, 250, 500, 1000, 2500, 5000, 10,000, 25,000, 50,000
Output	0-1 volt

TABLE 1 (Cont.)

CO_2 INFRARED GAS ANALYZER -- HORIBA - MODEL PIR 2000

Response Time (0-90%)	5 seconds
Zero Drift	± 1% of full scale in 24 hours
Span Drift	± 1% of full scale in 24 hours
Linearity	± 2% of full scale
Resolution	Less than 1% of full scale
Operating Ranges (%)	0-5, 0-15, 0-25
Output	0-1 volt

RATFISCH FID TOTAL HYDROCARBON ANALYZER -- MODEL 55CA

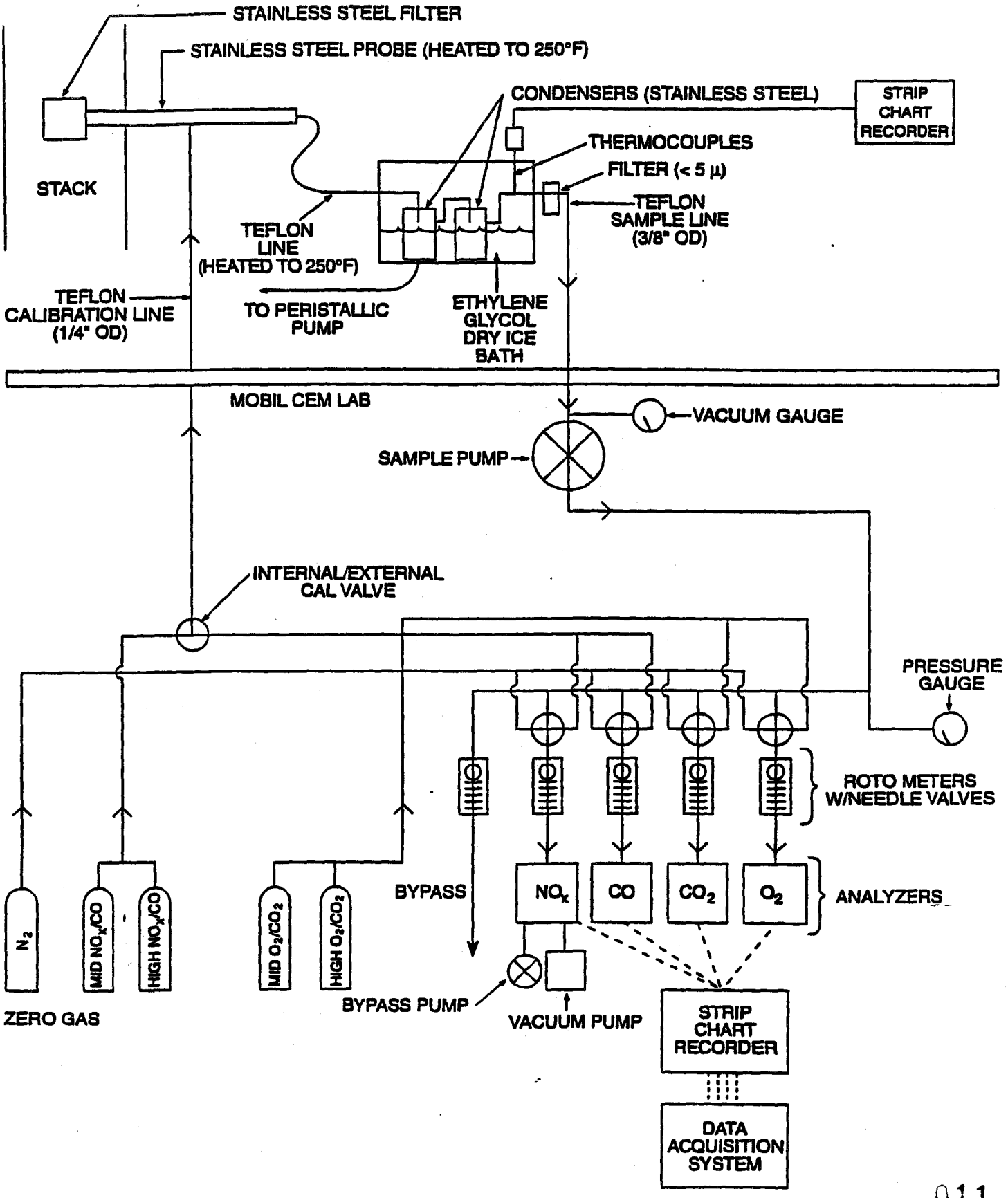
Response Time (0-90%)	5 seconds
Zero Drift	± 1% full scale in 24 hours
Span Drift	± 1% full scale in 24 hours
Linearity	± 1% full scale - constant
Accuracy	± 1% full scale at constant temp.
Operating Ranges (ppm)	10, 100, 1000, 10,000
Output	0 - 10 volts

LINSEIS MODEL L2045 FOUR PEN STRIP CHART RECORDER

Pen Speed	up to 120 cm/min
Measuring Response	0-20 volts
Linearity Error	0.25%
Accuracy	0.3%
Zero Suppression	Manual (from 1 to 10X full scale)

LINEAR 3 PEN CONTINUOUS -- MODEL 595 STRIP CHART

Pen Response	20 inches/second
Measuring Response	1 Mv through 5V
Zero Set	Electronically adjustable full scale with 1 full scale of zero suppression
Accuracy	Total limit of error ± 0.5%



011

CEM System Schematic

Method: **NO/NO_X by Continuous Analyzer**

Applicable Reference Methods: EPA 7E, EPA 20; CARB 100, BAAQMD ST-13A, SCAQMD 100.1

Principle: A sample is continuously withdrawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of NO or NO_X.

Analyzer: TECO Model 10AR

Measurement Principle: Chemiluminescence

Accuracy: 1% of full scale

Ranges: 0-2.5, 0-10, 0-25, 0-250, 0-1000, 0-2500, 0-10,000 ppm

Output: 0-10 V

Inferences: Compounds containing nitrogen (other than ammonia) may cause interference.

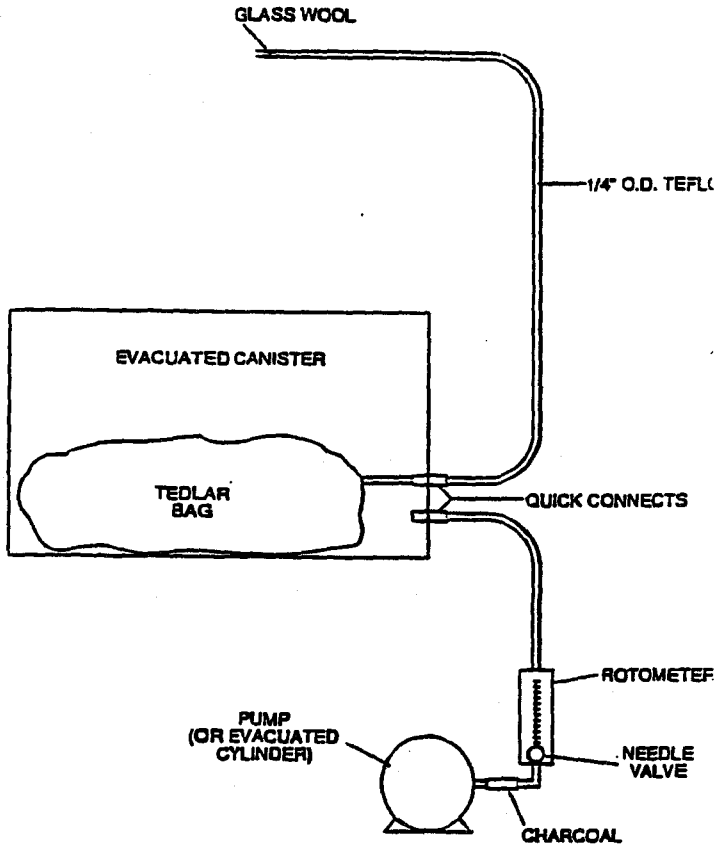
Response Time: 90%, 1.5 seconds (NO mode) and 1.7 seconds (NO_X mode)

Sampling Procedure: A representative flue gas sample is collected and conditioned using the CEM system described previously. If EPA Method 20 is used, that method's specific procedures for selecting sample points are used.

Analytical Procedure: The oxides of nitrogen monitoring instrument is a chemiluminescent nitric oxide analyzer. The operational basis of the instrument is the chemiluminescent reaction of NO and ozone (O_3) to form NO_2 in an excited state. Light emission results chemiluminescence is monitored through an optical filter by a high sensitivity photomultiplier tube, the output of which is electronically processed so it is linearly proportional to the NO concentration. The output of the instrument is in ppmV.

When NO_2 is expected to be present in the flue gas, a supercooled water dropout flask will be placed in the sample line to avoid loss of NO_2. Since NO_2 is highly soluble in water, "freezing out" the water will allow the NO_2 to reach the analyzers for analysis. The analyzer measures NO only. In the NO_X mode, the gas is passed through a moly converter which converts NO_2 to NO and a total NO_X measurement is obtained. NO_2 is determined as the difference between NO and NO_X. Use of a moly converter instead of a stainless steel converter eliminates NH_3 interference; NH_3 is converted to NO with a stainless converter, but not with a moly converter.

Method:	**Speciated VOC's by GC/MS Analyses**
Reference:	EPA TO-14
Principle:	A Tedlar bag is filled with flue gas at a constant rate. The bag contents are analyzed by GC/MS for the TO-14 list of speciated volatile organic compounds.
Sampling Procedure:	Sample is collected by evacuating the canister (see figure) at a constant rate over each test run using a rotameter/needle valve and a diaphragm pump. Prior to each sampling run, the evacuated canister (containing the Tedlar bag) is leak checked at 2" Hg vacuum. The sample train upstream of the Tedlar bag is then purged with stack gas. At the conclusion of each test run, each Tedlar bag sample is sealed and stored in a opaque container pending analysis.
Analytical Procedure:	Speciated volatile organic compound concentration is determined using GC/MS analyses.

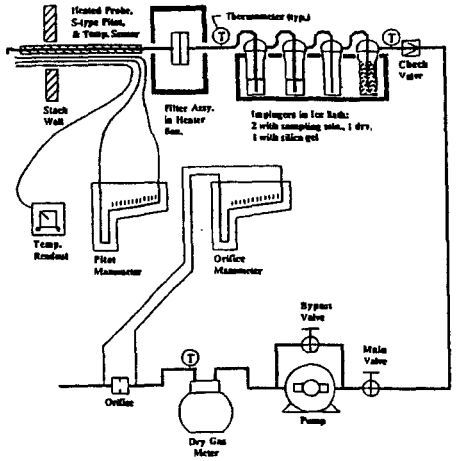


Method: **Determination of Gaseous Chloride and Fluoride in Emissions From Stationary Sources**

Reference: CARB Method 421

Principle: Gas with entrained aerosols is extracted isokinetically from the stack with a heated glass or quartz probe and passed through a heated filter to a series of chilled impingers where gaseous chlorides and fluorides are absorbed in a solution of sodium bicarbonate and sodium carbonate. This impinger solution is analyzed for chloride and fluoride by ion chromatography with conductivity detection. The chloride and fluoride peaks are identified by characteristic retention times and quantified by reference to external standards.

Sampling Procedure: The sampling train is shown in the figure. The sample is drawn isokinetically through a heated glass probe. The probe is connected to a heated filter which is then connected to an impinger train by Teflon tubing or glass. The train consists of one modified impinger (1st) and one standard greenburg-smith impinger (2nd) which contain 100 ml of impinger solution each; one empty modified impinger (3rd); and one modified impinger with approximately 200 grams of silica gel. The impinger solution consists of 1.7 mM sodium bicarbonate and 1.8 mM sodium carbonate. Sample is withdrawn isokinetically from each predetermined sample point (using Method 1) through the sample train which is followed by a vacuum line, pump, dry gas meter and calibrated orifice.



Sample Recovery: Following testing, moisture content is determined gravimetrically or volumetrically from initial and final impinger weights or volume. Samples are recovered as follows:

Container #1 - The contents of the first, second and third impingers are recovered into a 1 liter Nalgene bottle. Each impinger and connecting glassware is rinsed twice with impinger solution into Container #1.

Container #2 - Silica gel

Note: Particulate material or cleanup rinse from the probe, filter or filter holder is not added to Container No. 1; rather, any such material if not require for other analysis is discarded.

A field blank is collected and analyzed in the same manner as the samples.

Sample Analyses: Container #1 - The Container #1 sample is filtered and analyzed using ion chromatography for the chloride and fluoride ion.

Container #2 - silica gel is weighed to the nearest 0.5 g.

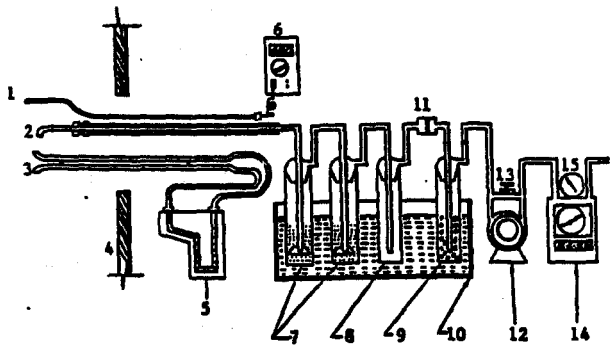
014

Method: **Determination of Hexavalent Chromium and Total Chromium Emissions From Stationary Sources**

Reference: CARB Method 425

Principle: Stack gases are withdrawn isokinetically from the source through a wet impingement train. The chromium aerosol is collected in impingers containing 0.1M sodium hydroxide solution and a Teflon-coated glass fiber filter. Aliquots of the collected sample are taken for hexavalent chromium analysis and total chromium analysis.

Sampling Procedure: The sample train is shown in the figure below. The sample is withdrawn isokinetically through a glass nozzle and glass probe and a series of four impingers. The first two impingers contain 100 ml of 0.1M NaOH; third impinger is empty; and the fourth contains 200 to 300 grams of silica gel. Between the third and fourth impinger is a Teflon-coated glass fiber filter.



1. Temperature Sensor
2. Probe: Glass Lined Stainless Steel
3. Type "S" Pitot Tube
4. Stack Wall
5. Pitot Tube Inclined Manometer
6. Temperature Sensor Meter
7. Impinger
8. Empty Bubbler
9. Bubbler with Tared Silica Gel
10. Ice Bath
11. Back-Up Filter
12. Sealed Pump
13. By-Pass Valve
14. Dry Gas Meter
15. Temperature Gauge

Sample Recovery: The nozzle and probe are rinsed three times with 0.1M NaOH into Container #1. The impingers and all connecting glassware are rinsed three times into Container #2. The Teflon-coated glass fiber filter is added to Container #2.

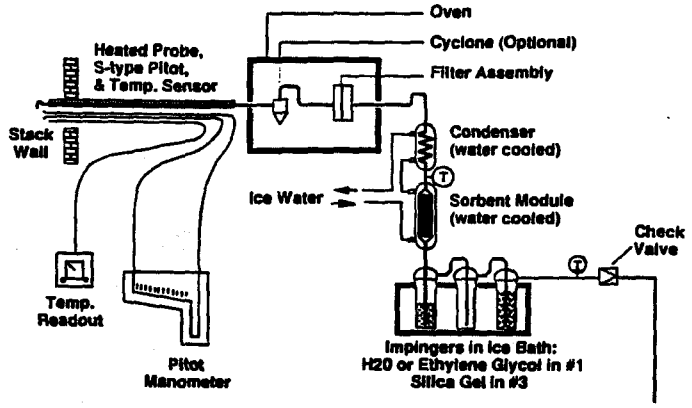
Sample Analyses: Each sample is split quantitatively. The hexavalent chromium analysis is performed using ion chromatography (IC) on each sample fraction. The split sample fractions are prepared for total chromium analysis by an acid digestion procedure. The total chromium analysis is performed with an atomic absorption spectrophotometer (AAS) equipped with a graphite furnace.

Method: **Determination of Polycyclic Aromatic Hydrocarbon (PAH) Emissions From Stationary Sources**

Reference: CARB Method 429 (DRAFT Ammendment March 1992)

Principle: Particulate and gaseous phase polycyclic aromatic hydrocarbons (PAH) are extracted isokinetically from the stack and collected on XAD-2 resin, in impingers, or in upstream sampling components (filter, probe and nozzle). The subsequent sample portions are extracted, combined and analyzed using gas chromatography coupled with either low or high resolution mass spectrometry (HRGC/HRMS) for individual PAH species.

Sampling Procedure: The sampling train is shown in the figure below. Sample is drawn isokinetically through a heated glass/quartz probe. The probe is connected to a heated filter which is then connected by Teflon tubing to the condenser, XAD-2 resin and into the impinger train. The train consists of three impingers; one modified short stem impinger with 100 ml of deionized water; one modified empty impinger; and one modified impinger with silica gel.



Sampling Recovery Procedures: The front half, back half and impinger train components are rinsed three times with acetone, hexane and dichloromethane into their respective containers. The filter is placed in an amber glass container (stored in dry ice). Prior to solvent rinsing the impinger contents are determined gravimetrically and placed in a separate amber glass sample container. The XAD sorbent module is capped and wrapped with aluminum foil and stored in a cool (4°C) clean container away from sunlight.

QA/QC samples include (1) a blank train which is leak checked and recovered as a sample and (2) a field blank of all sample solutions/sorbents is submitted to the lab in the event of blank train contamination.

Analytical Procedure: The required analytical method is isotope dilution mass spectrometry combined with high resolution gas chromatography. This entails the addition of internal standards to all samples in known quantities, matrix-specific extraction of the sample with appropriate organic solvents, preliminary fractionation and cleanup of extracts and analysis of the processed extract for PAH using high-resolution capillary column gas chromatography coupled with either low resolution mass spectrometry (HRGC/LRMS), or high resolution mass spectrometry (HRGC/HRMS).

Method: **Determination of Formaldehyde and Acetaldehyde Emissions From Stationary Sources**

Reference: CARB Method 430

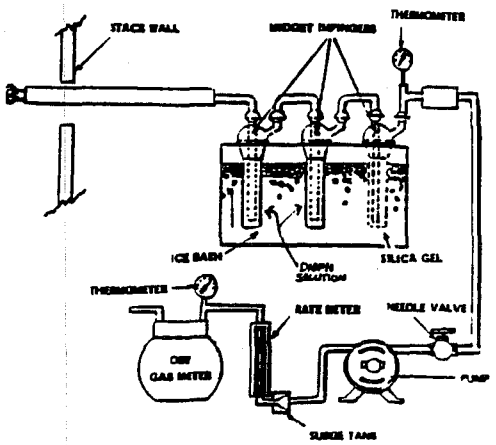
Principle: A sample of the source effluent is withdrawn from the stack through a series of two midget impingers containing 0.05 percent 2,4-dinitrophenol-hydrazine (DNPH). Aldehydes react with the DNPH solution by nucleophilic addition on the carbonyl followed by 1,2-elimination of water and the formulation of 2,4-dinitrophenylhydrazone.

Sampling Procedure: Prior to field sampling, four reagent blanks of the impinger solution are analyzed to verify anticipated reagent blank levels. In this method, 10 mls of the DNPH solution is placed into each of two midget impingers. Note: The DNPH solution must be used within 48 hours from makeup. The third impinger contains silica gel. The impingers are then placed in an ice bath. A leak check is performed by blocking the inlet to the impinger train. Any indication of a leak is considered unacceptable.

Initial dry gas meter readings and barometric pressure are recorded for each run. A constant flow rate of approximately 0.5 liter/minute is maintained during the sample run. Readings (dry gas meter, inlet/outlet temperature, sample flow rate and total cubic feet of sample) are recorded every ten minutes. Ice is added during the run to keep the temperature of the gas leaving the impingers at or below 68 degrees fahrenheit. At the conclusion of each run, the pump is turned off and the final dry gas meter readings are recorded. A final leak check is not required.

The contents of the midget impingers are recovered into their original containers. Two mls of the impinger solution is used to rinse the sample line into the first impinger. The sample line is then rinsed with 1 ml of reagent grade water. The sample containers are then sealed, labeled, weighed and transported back to the lab for analysis. One matrix spike is also conducted at this time. In addition, three field blanks are carried through all the required steps for sample preparation and analysis. A field blank consists of an impinger and sample line which is similar to a sampling impinger.

Analytical Procedure: The contents of each sample container are analyzed for aldehydes using high performance liquid chromatography (HPLC). All reported emission values are field blank corrected.

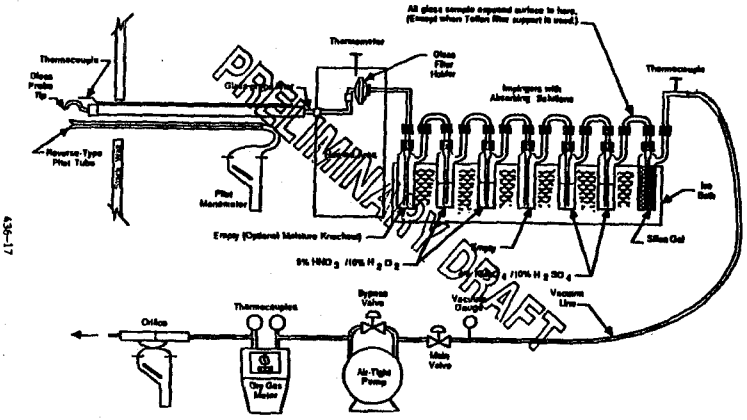


Method: **Determination of Multiple Metals Emissions From Stationary Sources**

Reference: CARB Draft Method 436

Principle: Stack sample is withdrawn isokinetically from the source, with particulate emissions collected in the probe and on a heated filter and gaseous emissions collected in a series of chilled impingers containing an aqueous solution of dilute nitric acid combined with dilute hydrogen peroxide in two impingers, and acidic potassium permanganate solution in two impingers. The subsequent sample fractions are digested in acid and analyzed for mercury by CVAAS and metals species using AA or ICP.

Sampling Procedure: The sampling train is shown in the figure. The sample is drawn isokinetically through a heated glass nozzle/probe. The probe is connected to a heated quartz filter which is then connected to an impinger train by Teflon tubing or glass. The train consists of one modified impinger (1st) and one standard Greenburg-Smith impinger (2nd) which contain 100 ml of 5% HNO_3/10% H_2O_2 solution each; one empty modified impinger (3rd); and two modified impingers (4th and 5th) with approximately 100 ml of 4% $KMnO_4$/10% H_2SO_4, and impinger #6 with approximately 200 g of silica gel. Sample is withdrawn isokinetically from each predetermined sample point (using Method 1) through the sample train which is followed by a vacuum line, pump, dry gas meter and calibrated orifice.



Sample Recovery

Container #1 - The filter is covered in its original petri dish.

Container #2 - The front half of the sample train is rinsed with 100 ml with 0.1N HNO_3 into a Nalgene container.

Container #3 - The contents of impingers 1 and 2 and the filter back half are rinsed two times with 0.1N HNO_3 into a precleaned glass sample bottle.

Container #4 - Impinger 3 is rinsed with 0.1N HNO_3 into a precleaned sample bottle.

Container #5 - Impingers 5 and 6 are rinsed with acidified potassium permangenate into a precleaned glass sample bottle.

Container #6 - If visible particulate is present, impingers 5 and 6 are rinsed with 25 ml of 8N HCl followed by 200 ml of DI H_2O in a glass sample container.

A blank train and reagent blank are collected and analyzed in the same manner as the samples.

Sample Analyses: An acid digestion is performed on sample containers 1, 2 and 3. An aliquot (10%) is removed for mercury analyses. The remaining samples are analyzed for individual metal species using ICAP or AA. Containers #4, 5, 6 and the container 1, 2 and 3 aliquots are analyzed for mercury using CVAAS.

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03-060

3/30/93

This method measures selected reduced sulfur species, including but not limited to hydrogen sulfide, carbonyl sulfide, methyl mercaptan, ethyl mercaptan, dimethyl sulfide, carbon disulfide, isopropyl mercaptan, n-propyl mercaptan, and dimethyl disulfide in gaseous sample matrices using gas chromatographic separation and a mass spectrometric and electrolytic conductivity detector (ELCD), where the ELCD measures hydrogen sulfide only. A non-polar methyl silicon capillary gas chromatographic column is used for component separation and selected ion monitoring is used for component quantification. Component quantification is obtained using a multi-component external standard prepared by Scott Specialty Gases. The lower detection limit varies by component but is at least 0.1 ppmv ethyl mercaptan (component of lowest sensitivity) for a 0.31 ml sample volume injection. The upper quantitation limit has not been determined but is at least beyond 80 ppmv dimethyl disulfide, for which response remained linear from 0.1 ppmv to 80 ppmv.

Hydrogen sulfide is measured using an electrolytic conductivity detector operated in the oxidative sulfur mode. A Chromosil 310 column, operated isothermally at 45°C. is used to separate H_2S from other sulfur components. A fixed volume loop injection is used in the analysis for H_2S.

Lower Detection Limits (LDL's):

Using a 1 ml injection volume for H_2S by electrolytic conductivity detector and 0.40 ml injection volume for GC/MS measured sulfur compounds, the following LDL's are obtained:-

	(ppmv)
Hydrogen sulfide	0.5
Carbonyl sulfide	0.03
Methyl mercaptan	0.03
Ethyl mercaptan	0.04
Dimethyl sulfide	0.02
Carbon disulfide	0.02
i-propyl mercaptan	0.03
n-propyl mercaptan	0.03
Dimethyl disulfide	0.02

Equipment:

A Hewlett-Packard 5890 series II gas chromatograph (GC), Hewlett-Packard 5971A Mass Selective Detector, 486 MS/DOS computer and HP operating software are used for all sulfur species except H_2S. The GC is fitted with a heated 6-port Valco 1/16" line, sample injection valve. All gas transfer lines to the sample loop are fused silica lined Restek tubing. The fixed volume (0.40 ml) sample loop is Teflon. The transfer line from the valve to the GC column is cleaned and treated blank 0.53 mm OD fused silica line with polyimide coating.

H_2S is measured using a Varian 1400 GC with the Hall oxidative quartz tube furnace and electrolytic cell attached. Nitrogen is used as carrier and oxygen is used as the combustion gas.

Multi-component gaseous standards are prepared by Scott Specialty Gas and are contained in two separate aluminum cylinders and a Scotty IV canister as follows:

Cylinder A (CAL12250)		Cylinder B (CAL3563)	
Carbonyl sulfide	15.2 ppmv	Hydrogen sulfide	12.3 ppmv
Ethyl mercaptan	13.4 ppmv	Methyl mercaptan	22.6 ppmv
Carbon disulfide	16.1 ppmv	Dimethyl sulfide	20.3 ppmv
		Dimethyl disulfide	

Scotty IV (mix 252)

Hydrogen Sulfide 93.8 ppmv

Gas tight clean glass volumetric syringes of 10, 20, & 50 ml capacity, with smooth glass barrel (not sintered glass) are used to make volumetric dilutions of sample or standard.

GC/MS SIM parameters:

	Dwell per ion	start time	Ions
Group 1:	75 msec.	8.0 min.	60
Group 2:	75 msec.	10.0 min.	47,48,64
Group 3:	75 msec.	14.5 min.	47,62,76,78,43,61
Group 4:	75 msec.	19.5 min.	79,94,122,142,156, 128

Components monitored:

Group 1: carbonyl sulfide
Group 2: methyl mercaptan
Group 3: ethyl mercaptan, dimethyl disulfide, carbon disulfide, isopropyl mercaptan, n-propyl mercaptan
Group 4: dimetnyl sulfide

Component	Quantitation ion	Confirmation ion
carbonyl sulfide	60	none
methyl mercaptan	47	48
ethyl mercaptan	62	47
dimethyl sulfide	62	47
carbon disulfide	76	78
iso-propyl mercaptan	76	43,47,61
n-propyl mercaptan	76	43,47,61
dimethyl disulfide	94	79

Sulfur dioxide is analyzed by monitoring mass 64 which is included in Group 2 ions.

Calibration:

Gaseous standards can be analyzed prior to or after a set of samples. Response factors are determined from a single point standard calibration. Multi-point calibrations are performed to verify linearity. Consistency of standard response with continuing calibrations is observed to indicate performance of multi-point calibration.

Samples containing components at less than the stated LDL can be analyzed by cryogenically focusing a measured volume of gaseous sample onto a glass bead filled Teflon loop immersed in liquid argon. The sample is thermally transferred upon injection by immersing the sample loop in near boiling temperature water. The LDL obtained by this technique is calculated as:

$$LDL_{cryo} = (\text{cryo volume}/0.40)*LDL_{0.40}$$

Acceptable volumes for cryogenic concentration range from 3 to 100 ml. and are determined based on amounts of other components in the sample such as water, carbon dioxide or hydrocarbons.

Procedure:

A volumetric sample of landfill or source collected gas is transferred from a Tedlar® bag to the 6-port valve injection line using a glass syringe of approximately 10 ml. A Teflon loop of 0.40 ml volume is used to inject the sample. When sample concentrations exceed that of the standard, appropriate volumetric sample dilutions are made using the glass syringes with dry nitrogen diluent. Immediately after sample injection, the GC/MS is started. Standards are analyzed in the same manner as samples. Appropriate component peaks are monitored and integrated after sample analysis data set has been obtained.

Hydrogen sulfide is measured using the electrolytic conductivity detector by a separate direct fixed loop valve injection using heated Teflon loop, transfer lines, and Teflon Chromosil 310 GC column.

A response factor for a standard component is calculated as:

rf = std. amt. / std. area

Sample concentration is calculated using the response factor:

conc. = rf x sample area

At least 10% of samples in a sample set, or minimum of one sample per set are analyzed twice to determine precision. A separate report showing repeat analyses results is included with an analytical report of sulfur component concentrations per each sample set. Repeat analyses must agree within +/- 10% except for component concentrations less than 1 ppmv. A nitrogen blank is analyzed between standards and samples to verify that there is no component carry-over. Samples are analyzed as soon after they are collected as possible, preferably same day and within four hours of collection. Data is being gathered to determine stability of sulfur compounds in Tedlar" bag containers in an effort to extend sample holding time. Samples are usually analyzed before standards to prevent carry-over, since most sulfur components measured in landfill gas samples are lower in concentration than those in the standards.

GC/MS Analysis Conditions:

GC conditions: a 30 M x 0.2 mm, 0.50 um film methyl silicon PONA column from Hewlett-Packard is temperature programmed as follows:

-65 degrees C, hold min.
15 degrees C min. to 220 degrees C, hold 5 min.

Valve oven Temp. 150 degrees C
GC/MS transfer line 180 degrees C
Carrier gas is helium, pressure regulated at 21 psi.

MS Conditions:

MS calibration is performed periodically prior to performing analyses using PFTBA (perfluoro-tributylamine) as supplied by Hewlett-Packard and as controlled by HP software under the mid-range auto tune program.
Solvent delay = 8 min.

Hall Detector/GC Analysis Conditions:

6' x 1/8" Teflon, Chromosil 310 analytical column
45 degrees C, isothermal
Valve oven & transfer line Temp. 105 degrees C.
Carrier gas is nitrogen, flow rate 18 cc/min.
Oxygen oxidation gas, flow rate 18 cc/min.
Quartz tube oxidation oven Temp. 650 degrees C.

Designation: D 3588 – 98 (Reapproved 2003)

Standard Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels[1]

This standard is issued under the fixed designation D 3588; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers procedures for calculating heating value, relative density, and compressibility factor at base conditions (14.696 psia and 60°F (15.6°C)) for natural gas mixtures from compositional analysis.[2] It applies to all common types of utility gaseous fuels, for example, dry natural gas, reformed gas, oil gas (both high and low Btu), propane-air, carbureted water gas, coke oven gas, and retort coal gas, for which suitable methods of analysis as described in Section 6 are available. Calculation procedures for other base conditions are given.

1.2 The values stated in inch-pound units are to be regarded as the standard. The SI units given in parentheses are for information only.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 1717 Method for Analysis of Commercial Butane-Butene Mixtures and Isobutylene by Gas Chromatography[3]

D 1945 Test Method for Analysis of Natural Gas by Gas Chromatography[4]

D 1946 Practice for Analysis of Reformed Gas by Gas Chromatography[4]

D 2163 Test Method for Analysis of Liquefied Petroleum (LP) Gases and Propane Concentrates by Gas Chromatography[5]

D 2650 Test Method for Chemical Composition of Gases by Mass Spectrometry[5]

2.2 *GPA Standards:*

GPA 2145 Physical Constants for the Paraffin Hydrocarbons and Other Components in Natural Gas[6]

GPA Standard 2166 Methods of Obtaining Natural Gas Samples for Analysis by Gas Chromatography[6]

GPA 2172 Calculation of Gross Heating Value, Relative Density, and Compressibility Factor for Natural Gas Mixtures from Compositional Analysis[6,7]

GPA Standard 2261 Method of Analysis for Natural Gas and Similar Gaseous Mixtures by Gas Chromatography[6]

GPA Technical Publication TP-17 Table of Physical Properties of Hydrocarbons for Extended Analysis of Natural Gases[6]

GPSA Data Book, Fig. 23-2, Physical Constants[6]

2.3 *TRC Document:*

TRC Thermodynamic Tables—Hydrocarbons[8]

2.4 *ANSI Standard:*

ANSI Z 132.1-1969: Base Conditions of Pressure and Temperature for the Volumetric Measurement of Natural Gas[9,10]

3. Terminology

3.1 *Definitions:*

3.1.1 *British thermal unit*—the defined International Tables British thermal unit (Btu).

3.1.1.1 *Discussion*—The defining relationships are:

$$1\ \text{Btu}\cdot\text{lb}^{-1} = 2.326\ \text{J}\cdot\text{g}^{-1}\ \text{(exact)}$$

$$1\ \text{lb} = 453.592\ 37\ \text{g (exact)}$$

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[1] This practice is under the jurisdiction of ASTM Committee D03 on Gaseous Fuels and is the direct responsibility of Subcommittee D03.03 on Determination of Heating Value and Relative Density of Gaseous Fuels.

Current edition approved May 10, 2003. Published May 2003. Originally approved in 1998. Last previous edition approved in 1998 as D 3588 – 98.

[2] A more rigorous calculation of $Z(T,P)$ at both base conditions and higher pressures can be made using the calculation procedures in "Compressibility and Super Compressibility for Natural Gas and Other Hydrocarbon Gases," American Gas Association Transmission Measurement Committee Report 8, AGA Cat. No. XQ1285, 1985, AGA, 1515 Wilson Blvd., Arlington, VA 22209.

[3] Discontinued. See 1981 *Annual Book of ASTM Standards*, Vol 05.01.

[4] *Annual Book of ASTM Standards*, Vol 05.06.

[5] *Annual Book of ASTM Standards*, Vol 05.01.

[6] Available from Gas Processors Association, 6526 E. 60th, Tulsa, OK 74145.

[7] The sole source of supply of the program in either BASIC or FORTRAN suitable for running on computers known to the committee at this time is the Gas Processors Association. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee [1], which you may attend.

[8] Available from Thermodynamics Research Center, The Texas A&M University, College Station, TX 77843-3111.

[9] Available from the American National Standards Institute, 25 W. 43rd St., 4th Floor, New York, NY 10036.

[10] Supporting data have been filed at ASTM International Headquarters and may be obtained by requesting Research Report RR: D03-1007.

By these relationships, 1 Btu = 1 055.055 852 62 J (exact). For most purposes, the value (rounded) 1 Btu = 1055.056 J is adequate.

3.1.2 *compressibility factor (z)*—the ratio of the actual volume of a given mass of gas at a specified temperature and pressure to its volume calculated from the ideal gas law under the same conditions.

3.1.3 *gross heating value*—the amount of energy transferred as heat from the complete, ideal combustion of the gas with air, at standard temperature, in which all the water formed by the reaction condenses to liquid. The values for the pure gases appear in GPA Standard 2145, which is revised annually. If the gross heating value has a volumetric rather than a mass or molar basis, a base pressure must also be specified.

3.1.4 *net heating value*—the amount of energy transferred as heat from the total, ideal combustion of the gas at standard temperature in which all the water formed by the reaction remains in the vapor state. Condensation of any "spectator" water does not contribute to the net heating value. If the net heating value has a volumetric rather than a mass or molar basis, a base pressure must also be specified.

3.1.5 *relative density*—the ratio of the density of the gaseous fuel, under observed conditions of temperature and pressure, to the density of dry air (of normal carbon dioxide content) at the same temperature and pressure.

3.1.6 *standard cubic foot of gas*—the amount of gas that occupies 1 ft^3 (0.028 m^3) at a temperature of 60°F (15.6°C) under a given base pressure and either saturated with water vapor (wet) or free of water vapor (dry) as specified (see ANSI Z 132.1). In this practice, calculations have been made at 14.696 psia and 60°F (15.6°C), because the yearly update of GPA 2145 by the Thermodynamics Research Center, on which these calculations are based, are given for this base pressure. Conversions to other base conditions should be made at the end of the calculation to reduce roundoff errors.

3.1.7 *standard temperature (USA)*—60°F (15.6°C).

3.2 *Symbols*:

3.2.1 *Nomenclature*:

3.2.1.1 B—second virial coefficient for gas mixture

3.2.1.2 $\sqrt{\beta_{ij}}$—summation factor for calculating real gas correction (alternate method)

3.2.1.3 (cor)—corrected for water content

3.2.1.4 (dry)—value on water-free basis

3.2.1.5 d—density for gas relative to the density of air.

3.2.1.6 d^{id}—ideal relative density or relative molar mass, that is, molar mass of gas relative to molar mass of air

3.2.1.7 G^{id}—molar mass ratio

3.2.1.8 H_m^{id}—gross heating value per unit mass

3.2.1.9 H_v^{id}—gross heating value per unit volume

3.2.1.10 H_n^{id}—gross heating value per unit mole

3.2.1.11 h_m^{id}—net heating value per unit mass

3.2.1.12 h_v^{id}—net heating value per unit volume

3.2.1.13 h_n^{id}—net heating value per unit mole

3.2.1.14 a, b, c—in Eq 1, integers required to balance the equation: C, carbon; H, hydrogen; S, sulfur; O, oxygen

3.2.1.15 *(id)*—ideal gas state

3.2.1.16 *(l)*—liquid phase

3.2.1.17 M—molar mass

3.2.1.18 m—mass flow rate

3.2.1.19 n—number of components

3.2.1.20 P—pressure in absolute units (psia)

3.2.1.21 Q^{id}—ideal energy per unit time released as heat upon combustion

3.2.1.22 R—gas constant, 10.7316 psia.ft^3/(lb mol•R) in this practice (based upon R = 8.314 48 J/(mol•K))

3.2.1.23 (sat)—denotes saturation value

3.2.1.24 T—absolute temperature, °R = °F + 459.67 or K = °C + 273.15

3.2.1.25 (T, P)—value dependent upon temperature and pressure

3.2.1.26 V—gas volumetric flow rate

3.2.1.27 x—mole fraction

3.2.1.28 Z—gas compressibility factor repeatability of property

3.2.1.29 δ—repeatability of property

3.2.1.30 ρ—density in mass per unit volume

3.2.1.31 $\sum_{i=1}^{n}$—property summed for Components 1 through n, where n represents the total number of components in the mixture

3.2.2 *Superscripts*:

3.2.2.1 *id*—ideal gas value

3.2.2.2 *l*—liquid

3.2.2.3 σ—value at saturation (vapor pressure)

3.2.2.4 '—reproducibility

3.2.3 *Subscripts*:

3.2.3.1 *a*—value for air

3.2.3.2 *a*—relative number of atoms of carbon in Eq 1

3.2.3.3 *b*—relative number of atoms of hydrogen in Eq 1

3.2.3.4 *c*—relative number of atoms of sulfur in Eq 1

3.2.3.5 *j*—property for component *j*

3.2.3.6 *ii*—non-ideal gas property for component *i*

3.2.3.7 *ij*—non-ideal gas property for mixture of *i* and *j*

3.2.3.8 *jj*—non-ideal gas property for component *j*

3.2.3.9 *w*—value for water

3.2.3.10 1—property for Component 1

3.2.3.11 2—property for Component 2

4. Summary of Practice

4.1 The ideal gas heating value and ideal gas relative density at base conditions (14.696 psia and 60°F (5.6°C)) are calculated from the molar composition and the respective ideal gas values for the components; these values are then adjusted by means of a calculated compressibility factor.

5. Significance and Use

5.1 The heating value is a measure of the suitability of a pure gas or a gas mixture for use as a fuel; it indicates the amount of energy that can be obtained as heat by burning a unit of gas. For use as heating agents, the relative merits of gases from different sources and having different compositions can be compared readily on the basis of their heating values. Therefore, the heating value is used as a parameter for determining the price of gas in custody transfer. It is also an essential factor in calculating the efficiencies of energy conversion devices such as gas-fired turbines. The heating values of a gas depend not only upon the temperature and pressure, but also upon the degree of saturation with water vapor.

However, some calorimetric methods for measuring heating values are based upon the gas being saturated with water at the specified conditions.

5.2 The relative density (specific gravity) of a gas quantifies the density of the gas as compared with that of air under the same conditions.

6. Methods of Analysis

6.1 Determine the molar composition of the gas in accordance with any ASTM or GPA method that yields the complete composition, exclusive of water, but including all other components present in amounts of 0.1 % or more, in terms of components or groups of components listed in Table 1. At least 98 % of the sample must be reported as individual components (that is, not more than a total of 2 % reported as groups of components such as butanes, pentanes, hexanes, butenes, and so forth). Any group used must be one of those listed in Table 1 for which average values appear. The following test methods are applicable to this practice when appropriate for the sample under test: Test Methods D 1717, D 1945, D 2163, and D 2650.

7. Calculation—Ideal Gas Values; Ideal Heating Value

7.1 An ideal combustion reaction in general terms for fuel and air in the ideal gas state is:

$$C_aH_bS_c(id) + (a + b/4 + c)O_2(id) \rightarrow aCO_2(id) + (b/2)H_2O(id \text{ or } l) + cSO_2(id) \quad (1)$$

where *id* denotes the ideal gas state and *l* denotes liquid phase. The ideal net heating value results when all the water remains in the ideal gas state. The ideal gross heating value results when all the water formed by the reaction condenses to liquid. For water, the reduction from $H_2O(id)$ to $H_2O(l)$ is H_w^{id}

TABLE 1 Properties of Natural Gas Components at 60°F and 14.696 psia[A]

Compound	Formula	Molar Mass, lb·lbmol [1B]	Molar Mass, Ratio, G^{id}[C]	Ideal Gross Heating Value[D]			Ideal Net Heating Value			Summation Factor, b_i, psia^{-1}
				H_n^{id}, kJ · mol^{-1}	H_m^{id}, Btu · lbm^{-1}	H_v^{id}, Btu · ft^{-3}	h_n^{id}, kJ · mol^{-1}	h_m^{id}, Btu · lbm^{-1}	h_v^{id}, Btu · ft^{-3}	
Hydrogen	H_2	2.0159	0.069 60	286.20	6 1022	324.2	241.79	51 566	273.93	0
Helium	He	4.0026	0.138 20	0	0	0	0	0	0	0
Water	H_2O	18.0153	0.622 02	44.409	1059.8	50.312	0	0	0	0.0623
Carbon monoxide	CO	28.010	0.967 11	282.9	4342	320.5	282.9	4 342	320.5	0.0053
Nitrogen	N_2	28.0134	0.967 23	0	0	0	0	0	0	0.0044
Oxygen	O_2	31.9988	1.104 8	0	0	0	0	0	0	0.0073
Hydrogen sulfide	H_2S	34.08	1.176 7	562.4	7 094.2	637.1	517.99	6 534	586.8	0.0253
Argon	Ar	39.948	1.379 3	0	0	0	0	0	0	0.0071
Carbon dioxide	CO_2	44.010	1.519 6	0	0	0	0	0	0	0.0197
Air	[E]	28.9625	1.000 0	0	0	0	0	0	0	0.0050
Methane	CH_4	16.043	0.553 92	891.63	23 891	1010.0	802.71	21 511	909.4	0.0116
Ethane	C_2H_6	30.070	1.038 2	1562.06	22 333	1769.7	1428.83	20 429	1618.7	0.0239
Propane	C_3H_8	44.097	1.522 6	2220.99	21 653	2516.1	2043.3	19 922	2314.9	0.0344
i-Butane	C_4H_{10}	58.123	2.006 8	2870.45	21 232	3251.9	2648.4	19 590	3000.4	0.0458
n-Butane	C_4H_{10}	58.123	2.006 8	2879.63	21 300	3262.3	2657.6	19 658	3010.8	0.0478
i-Pentane	C_5H_{12}	72.150	2.491 2	3531.5	21 043	4000.9	3265.0	19 456	3699.0	0.0581
n-Pentane	C_5H_{12}	72.150	2.491 2	3535.8	21 085	4008.9	3269.3	19 481	3703.9	0.0631
n-Hexane	C_6H_{14}	86.177	2.975 5	4198.1	20 943	4755.9	3887.2	19 393	4403.9	0.0802
n-Heptane	C_7H_{16}	100.204	3.459 8	4857.2	20 839	5502.5	4501.9	19 315	5100.3	0.0944
n-Octane	C_8H_{18}	114.231	3.944 1	5515.9	20 759	6248.9	5116.2	19 256	5796.2	0.1137
n-Nonane	C_9H_{20}	128.258	4.428 4	6175.9	20 701	6996.5	5731.8	19 213	6493.6	0.1331
n-Decane	$C_{10}H_{22}$	142.285	4.912 7	6834.9	20 651	7742.9	6346.4	19 176	7189.9	0.1538
Neopentane	C_5H_{12}	72.015	2.491 2	3517.27	20 958	3985	3250.8	19 371	3683	
2-Methylpentane	C_6H_{14}	86.177	2.975 5	4190.43	20 905	4747	3879.6	19 355	4395	0.080
3-Methylpentane	C_6H_{14}	86.177	2.975 5	4193.03	20 918	4750	3882.2	19 367	4398	0.080
2,2-Dimethylbutane	C_6H_{14}	86.177	2.975 5	4180.63	20 856	4736	3869.8	19 306	4384	0.080
2,3-Dimethylbutane	C_6H_{14}	86.177	2.975 5	4188.41	20 895	4745	3877.5	19 344	4393	0.080
Cyclopropane	C_3H_6	42.081	1.452 9	2092.78	21 381	2371	1959.6	20 020	2220	...
Cyclobutane	C_4H_8	56.108	1.937 3	2747.08	21 049	2747	2569.4	19 688	2911	...
Cyclopentane	C_5H_{10}	70.134	2.421 5	3322.04	20 364	3764	3100.0	19 003	3512	...
Cyclohexane	C_6H_{12}	84.161	2.905 9	3955.84	20 208	4482	3689.4	18 847	4180	...
Ethyne (acetylene)	C_2H_2	26.038	0.899 0	1301.32	21 487	1474	1256.9	20 753	1424	0.021
Ethene (ethylene)	C_2H_4	28.054	0.968 6	1412.06	21 640	1600	1323.2	20 278	1499	0.020
Propene (propylene)	C_3H_6	42.081	1.452 9	2059.35	21 039	2333	1926.1	19 678	2182	0.033
Benzene	C_6H_6	78.114	2.697 1	3202.74	18 177	3742	3169.5	17 444	3591	0.069
Butanes (ave)	C_4H_{10}	58.123	2.006 8	2875	21 266	3257	2653	19 623	3006	0.046
Pentanes (ave)	C_5H_{12}	72.150	2.491 2	3534	21 056	4003	3267	19 469	3702	0.062
Hexanes (ave)	C_6H_{14}	86.177	2.975 5	4190	20 904	4747	3879	19 353	4395	0.080
Butenes (ave)	C_4H_8	56.108	1.937 2	2716	20 811	3077	2538	19 450	2876	0.046
Pentenes (ave)	C_5H_{10}	70.134	2.421 5	3375	20 691	3824	3153	19 328	3572	0.060

[A] This table is consistent with GPA 2145-89, but it is necessary to use the values from the most recent edition of GPA 2145 for custody transfer calculations.
[B] 1984 Atomic Weights: C = 12.011, H = 1.00794, O = 15.9994, N = 14.0067, S = 32.06.
[C] Molar mass ratio is the ratio of the molar mass of the gas to that of air.
[D] Based upon ideal reaction; the entry for water represents the total enthalpy of vaporization.
[E] Composition from: F. E. Jones, *J. Res. Nat. Bur. Stand.*, Vol. 83, 419, 1978.

$- H_w^i$, the ideal enthalpy of vaporization, which is somewhat larger than the enthalpy of vaporization $H_w^i - H_w^{i\prime}$.

7.1.1 Because the gross heating value results from an ideal combustion reaction, ideal gas relationships apply. The ideal gross heating value per unit mass for a mixture, H_m^{id}, is:

$$H_m^{id} = \sum_j^n x_j M_j H_{m,j}^{id} / \sum_{j=1}^n x_j M_j \quad (2)$$

where: x_j is the mole fraction of Component *j*, M_j *is the molar mass of Component j from Table 1, and n is the total number of components.*

7.1.2 $H_{m,j}^{id}$ is the pure component, ideal gross heating value per unit mass for Component *j* (at 60°F (15.6°C) in Table 1). Values of H_m^{id} are independent of pressure, but they vary with temperature.

7.2 *Ideal Gas Density*

7.2.1 The ideal gas density, ρ^{id}, is:

$$\rho^{id} = (P/RT) \sum_{j=1}^n x_j M_j = MP/RT \quad (3)$$

where: M is the molar mass of the mixture,

$$M = \sum_{j=1}^n x_j M_j \quad (4)$$

P is the base pressure in absolute units (psia), R is the gas constant, 10.7316 psia.ft^3/(lb mol•°R) in this practice, based upon R = 8.314 48 J/(mol•K), T is the base temperature in absolute units (°R = °F + 459.67). Values of the ideal gas density at 60°F (15.6°C) and 14.696 psia are in GPA Standard 2145.

7.3 *Ideal Relative Density*:

7.3.1 The ideal relative density d^{id} is:

$$d^{id} = \sum_{j=1}^n x_j d_j = \Sigma x_j M_j / M_a = M/M_a \quad (5)$$

where: M_a is the molar mass of air. The ideal relative density is the molar mass ratio.

7.4 *Gross Heating Value per Unit Volume*:

7.4.1 Multiplication of the gross heating value per unit mass by the ideal gas density provides the gross heating value per unit volume, H_v^{id}:

$$H_v^{id} = \rho^{id} H_m^{id} = \sum_{j=1}^n x_j H_{v,j}^{id} \quad (6)$$

$H_{v,j}^{id}$ is the pure component gross heating value per unit volume for Component *j* at specified temperature and pressure (60°F (15.6°C) and 14.696 psia in Table 1, ideal gas values).

7.4.2 Conversion of values in Table 1 to different pressure bases results from multiplying by the pressure ratio:

$$H_v^{id}(P) = H^{id}(P = 14.696) \times P/14.696 \quad (7)$$

7.5 *Real Gas Values—Compressibility Factor*:

7.5.1 The compressibility factor is:

$$Z(T,P) = \rho^{id}/\rho = (MP/RT)/\rho \quad (8)$$

where ρ is the real gas density in mass per unit volume. At conditions near ambient, the truncated virial equation of state satisfactorily represents the volumetric behavior of natural gas:

$$Z(T,P) = 1 + BP/RT \quad (9)$$

where B is the second virial coefficient for the gas mixture. The second virial coefficient for a mixture is:

$$B = x_1^2 B_{11} + x_2^2 B_{22} + \cdots + x_n^2 B_{nn} + 2x_1 x_2 B_{1,2} + \cdots + 2x_{n-1} x_n B_{n-1,n}$$

$$\sum_{i=1}^n \sum_{j=1}^n x_i x_j B_{ij} \quad (10)$$

where B_{jj} is the second virial coefficient for Component *j* and B_{ij} is the second cross virial coefficient for Components *i* and *j*. The second virial coefficients are functions of temperature. Eq 9 can be used with Eq 10 for calculation of the compressibility factor for the various pressure bases, but it is not accurate at pressures greater than two atmospheres. Special treatment is not required for H_2 and He at mole fractions up to 0.01. Calculations can be made with $B_{ij} = 0$ for hydrogen and helium.

7.5.2 Eq 9 and Eq 10 for calculation of $Z(T,P)$ for a gas mixture are rigorous but require considerable calculations and information that is not always available. An alternative, approximate expression for $Z(T,P)$ that is more convenient for hand calculations is:

$$Z(T,P) = 1 + P[\sum_{j=1}^n x_j \sqrt{\beta_{jj}}]^2 \quad (11)$$

where $\beta_{jj} = B_{jj}/RT$ and $\sqrt{\beta_{jj}}$ is the summation factor for Component *j*. Values of $\sqrt{\beta_{jj}}$ at 60°F (15.6°C) appear in Table 2. The method based upon Eq 11 has been adopted for this practice.

7.6 *Real Gas Density*:

7.6.1 The real gas density ρ at a specific temperature and pressure is:

$$\rho = \rho^{id}/Z \quad (12)$$

where: ρ^{id} and Z are evaluated at the same temperature and pressure.

7.7 *Real Relative Density*:

7.7.1 The real relative density d is:

$$d = \rho/\rho_a = MZ_a/M_a Z \quad (13)$$

7.8 *Real Heating Value*—The real heating value is not given by division of the ideal heating value by the compressibility factor. Real gas heating values differ from the ideal gas values by less than one part in 10^4 at 14.696 psia, which is of the order of the accuracy of the heating values.

7.9 *Gross Heating Value of Water Wet Gas*:

7.9.1 If the gas contains water as a component but the compositional analysis is on a dry basis, it is necessary to adjust the mole fractions to reflect the presence of water. The corrected mole fractions are:

$$x_j(\text{cor}) = x_j(1 - x_w) \quad (14)$$

The mole fraction of water can range from zero up to the saturated value. The saturated value for x_w is, assuming Raoult's Law:

$$x_w(\text{sat}) = P_w^s/P \quad (15)$$

where: P_w^s is the vapor pressure of water (0.256 36 psia at 60°F (15.6°C)).

7.9.2 Technically, water has a gross heating value, the ideal enthalpy of condensation. If only the water that is formed

TABLE 2 Example Calculations of Gas Properties at 60°F and 14.696 psia (Gas Analysis on Dry Basis)[A]

NOTE—Division of Hv^{id} by Z does not give a real gas heating value but rather an ideal gas heating value per real cubic feet. Any digits carried beyond 1 part in 1000 are not significant but only alleviate roundoff error. Although CO_2 has a carbon atom, its $\alpha = 0$ because it is not part of the fuel formula $C_\alpha H_\beta S_\gamma$.

Compound	x_i	α_i	β_i	γ_i	Hv_i^d	G_i^{id}	b_i	$x_i\alpha_i$	$x_i\beta_i$	$x_i\gamma_i$	$x_i\,Hv_i^{id}$	$x_i\,G_i^{id}$	$x_i b_i$
Methane	0.8302	1	4	0	1010.0	0.553 92	0.0116	0.8302	3.3208	0	838.5	0.4599	0.009 63
Ethane	0.0745	2	6	0	1769.7	1.038 20	0.0239	0.1490	0.4470	0	131.8	0.0773	0.001 78
Propane	0.0439	3	8	0	2516.1	1.522 60	0.0344	0.1317	0.3512	0	110.5	0.0668	0.001 51
i-Butane	0.0083	4	10	0	3251.9	2.006 80	0.0458	0.0332	0.0830	0	27.0	0.0167	0.000 38
n-Butane	0.0108	4	10	0	3262.3	2.006 80	0.0478	0.0432	0.1080	0	35.2	0.0217	0.000 52
i-Pentane	0.0031	5	12	0	4000.9	2.491 20	0.0581	0.0155	0.0372	0	12.4	0.0077	0.000 18
n-Pentane	0.0025	5	12	0	4008.9	2.491 20	0.0631	0.0125	0.03	0	10.0	0.0062	0.000 16
Hexane	0.0030	6	14	0	4755.9	2.975 50	0.0802	0.0180	0.0420	0	14.3	0.0089	0.000 24
Helium	0.0003	0	0	0	0	0.138 20	0	0	0	0	0	0.0000	0.000 00
Nitrogen	0.0032	0	0	0	0	0.967 23	0.0044	0	0	0	0	0.0031	0.000 01
Carbon dioxide	0.0202	0	0	0	0	1.519 60	0.0197	0	0	0	0	0.0307	0.000 40
Summation	1.0000	...	...	...	...	...	...	1.2333	4.4192	0	1179.7	0.6991	0.014 81

[A] $x_w = (0.256\,36)/14.696 = 0.0174$
G^{id} (dry gas) = 0.6991
Z (dry gas) = $1 - [0.014\,81]^2(14.696) = 0.9968$
Z (dry air) = $1 - [0.0050]^2(14.696) = 0.9996$
G (dry gas, dry air) = 0.6991(0.9996)/0.9968 = 0.7011
G (dry gas, sat air) = 0.6991(0.9995)/0.9968 = 0.7010
Hv^{id} (dry gas, dry air) = 1179.7 Btu·ft^{-3}
Hv^{id} (sat gas, dry air) = 1179.7(0.9826) = 1159.1 Btu·ft^{-3}
$1 - x_w = 0.9826$
G^{id} (sat gas) = 0.6991(0.9826) + 0.0174(0.622 02) = 0.6978
Z (sat gas) = $1 - [0.9826(0.014\,81) + 0.0174(0.0623)]^2(14.696) = 0.9964$
Z (sat air) = $1 - [0.9826(0.0050) + 0.0174(0.0623)]^2(14.696) = 0.9995$
G (sat gas, dry air) = 0.6978(0.9996)/0.9964 = 0.7001
G (sat gas, sat air) = 0.6978(0.9995)/0.9964 = 0.7000
$\{Hv^{id}/Z\}$(dry gas, dry air) = 1179.7/0.9968 = 1183.5 Btu·ft^{-3}
$\{Hv^{id}/Z\}$ (sat gas, dry air) = 1159.1/(0.9964) = 1163.3 Btu·ft^{-3}

during the combustion condenses, then the heat released upon combustion of a wet gas with dry air becomes:

$$H_v^{id}\,(\text{wet gas}) = (1 - x_w)H_v^{id}\,(\text{dry gas}) \tag{16}$$

For water-saturated gas, x_w at 60° F (15.6° C) is $0.256\,36/P_b$ where P_b is the base pressure. Eq 16 is adequate for custody transfer applications as a matter of definition. However, this equation does not accurately describe the effect of water upon the heating value. Appendix X1 contains a rigorous examination of the effect of water.

7.10 *Calculation of the Ideal Energy Released as Heat:*

7.10.1 When multiplied by the gas flow rate, the ideal gross heating value provides the ideal energy released as heat upon combustion, $\dot{Q}^{id}$, an ideal gas property:

$$\dot{Q}^{id} = \dot{m}H_m^{id} \tag{17}$$

where $\dot{m}$ is the mass flow rate. For an ideal gas, the mass flow rate is related to the volumetric flow rate, $\dot{V}^{id}$, by:

$$\dot{m} = \dot{V}^{id}\rho^{id} \tag{18}$$

and

$$\dot{Q}^{id} = \dot{V}^{id}H_v^{id} \tag{19}$$

7.10.2 The ideal gas flow rate is related to the real gas flow rate by:

$$\dot{V}^{id} = \dot{V}Z \tag{20}$$

where $\dot{V}$ is the real gas volumetric flow rate and $Z(T,P)$ is the real gas compressibility factor at the same T and P. Hence, combining Eq 19 and Eq 20 gives:

$$\dot{Q}^{id} = H_v^{id}\,\dot{V}/Z\,(T,P) \tag{21}$$

NOTE 1—The ideal energy released per unit time as heat upon combustion, $\dot{Q}^{id}$, can be calculated using the mass flow rate (Eq 17), the ideal gas flow rate (Eq 19), or the real gas flow rate (Eq 21), but is always an ideal gas property. Division of H_v^{id} by the gas compressibility factor $Z(T,P)$ does not produce a real gas heating value but only allows calculation of $\dot{Q}^{id}$ using the real gas flow rate rather than the ideal gas flow rate.

8. Precision

8.1 The properties reported in this practice derive from experimental enthalpy of combustion measurements which, in general, are accurate to 1 part in 1000. The extra digits that appear in the accompanying tables alleviate problems associated with roundoff errors and internal consistency, but they are not significant. Table 3

8.2 The values of properties in this practice are those that appear in GPA Standard 2172-97, Fig. 23-2 of the GPSA Engineering Data Book, GPA TP-17, and the TRC Thermodynamic Tables—Hydrocarbons. GPA Standard 2145 is updated annually and the values in that standard should be used in all calculations.

NOTE 2—Three sources of error must be considered: errors in heating values of the components, errors in the calculated compressibility factor, and errors in the composition. The uncertainty (twice the standard deviation) of the ideal gas heating values for components should be 0.03 %. Such errors affect the bias and the agreement between calculated and measured heating values, but they do not affect the precision. Error in the calculated compressibility factor varies with the composition of the gas, but for natural gas, this error should be less than 0.03 % and

TABLE 3 Example Calculations of Gas Properties at 60°F and 14.696 psia (Gas Analysis on Wet Basis)[A]

Note – Division of Hv^d by Z does not give a real gas heating value but rather an ideal gas heating value per real cubic feet. Any digits carried beyond 1 part in 1000 are not significant but only alleviate roundoff error. Although CO_2 has a carbon atom, its $\alpha = 0$ because it is not part of the fuel formula $C_\alpha H_\beta S_\gamma$.

Compound	x_i	α_i	β_i	γ_i	Hv_i^d	G_i^{id}	b_i	$x_i\alpha_i$	$x_i\beta_i$	$x_i\gamma_i$	$x_i Hv_i^d$	$x_i G_i^{id}$	$x_i b_i$
Methane	0.8157	1	4	0	1010.0	0.553 92	0.0116	0.8157	3.2629	0	823.9	0.4518	0.009 46
Ethane	0.0732	2	6	0	1769.7	1.038 20	0.0239	0.1464	0.4392	0	129.5	0.0760	0.001 75
Propane	0.0431	3	8	0	2516.1	1.522 60	0.0344	0.1294	0.3451	0	108.5	0.0657	0.001 48
i-Butane	0.0082	4	10	0	3251.9	2.006 80	0.0458	0.0326	0.0816	0	26.5	0.0164	0.000 37
n-Butane	0.0106	4	10	0	3262.3	2.006 80	0.0478	0.0424	0.1061	0	34.6	0.0213	0.000 51
i-Pentane	0.0030	5	12	0	4000.9	2.491 20	0.0581	0.0152	0.0366	0	12.2	0.0076	0.000 18
n-Pentane	0.0025	5	12	0	4008.9	2.491 20	0.0631	0.0123	0.0295	0	9.8	0.0061	0.000 15
Hexane	0.0029	6	14	0	4755.9	2.975 50	0.0802	0.0177	0.0413	0	14.0	0.0088	0.000 24
Helium	0.0003	0	0	0	0	0.138 20	0	0	0	0	0	0	0
Nitrogen	0.0031	0	0	0	0	0.967 23	0.0044	0	0	0	0	0.0030	0
Carbon dioxide	0.0198	0	0	0	0	1.519 60	0.0197	0	0	0	0	0.0302	0.000 39
Water	0.0174	0	0	0	50.3	0.622 02	0.0623	0	0	0	0.9	0.0108	0.001 09
Summation	1.0000	...	...	...	...	...	...	1.2118	4.3421	0	1160.0	0.6977	0.015 64

[A] G^{id} (sat gas) = 0.6977
Z (sat gas) = 1 – [0.015 64]^2(14.696) = 0.9964
Z (dry air) = 1 – [0.0050]^2(14.696) = 0.9996
G (sat gas, dry air) = 0.6977(0.9996)/0.9964 = 0.6999
Hv^d (sat gas, dry air) = 1160.0 – 0.9 = 1159.1 Btu·ft^{-3}
Z (sat air) = 1 – [0.9826(0.050) + 0.0174(0.0623)]^2(14.696) = 0.9995
G (sat gas, sat air) = 0.6977(0.9995)/0.9964 = 0.6999
(Hv^d/Z)(sat gas, dry air) = 1159.1/(0.9964) = 1163.3 Btu·ft^{-3}

negligible compared to errors arising from uncertainty in composition. In this practice, the errors in the heating values of the components and the calculated compressibility factor, Z, are neglected. The precision of the method is related to the repeatability and reproducibility of the analysis. An example appears in .

Note 3 – It is essential to include all components in the gas sample that appear with mole fractions greater than or equal to 0.001 in the analysis. Some routine analyses do not determine compounds such as He and H_2S, but these compounds are important to the calculations.

8.3 *Repeatability*:

8.3.1 If all the components are analyzed and the results are normalized, then the repeatability of the heating value, δH is:

$$\frac{\delta H}{H^{id}} = \sqrt{\frac{1}{(H^{id})^2}\sum_{j=1}^{n}[(H^{id} \quad H_j^{id})\delta x_j]^2} \tag{22}$$

8.3.2 If the results of the analysis are made to sum to 1.0 by calculating the methane mole fraction as the difference between 1.0 and the sum of the mole fractions of the other components, then

$$\frac{\delta H}{H^{id}} \quad \sqrt{\frac{1}{(H^{id})^2}\sum_{j=1}^{n}[H_j^{id}\delta x_j]^2} \tag{23}$$

where δx_j is the repeatability of the method of analysis for Component j. The differences between heating values calculated from successive pairs of analysis performed by the same operator using the same sample of gas and the same instrument should exceed $2\delta H$ in only 5 % of the tests when δH is taken as one standard deviation.

8.4 *Reproducibility*—The reproducibility $\delta H'$ is calculated from Eq 22 and Eq 23 using $\delta x'_j$, the reproducibility of the method of analysis for Compound j. The difference between heating values calculated from analysis obtained in different laboratories is expected to exceed $\delta H'$ for only 5 % of the analyses.

APPENDIXES

(Nonmandatory Information)

X1. EFFECT OF WATER UPON THE HEATING VALUE

X1.1 Custody transfer of natural gas uses a simple pricing equation that states that the cost of gas is the rate of energy released upon combustion multiplied by the price of gas per energy unit multiplied by the time or accounting period. The rate of energy released upon combustion is the product of the heating value of the gas and the flow rate of the gas. The flow rate of the gas requires knowledge of the compressibility factor and the relative density of the gas. All three custody transfer properties (heating value, compressibility factor, and relative density) can be calculated from the composition given pure component property tables. The equations for calculating the properties of dry natural gas are well known, but this appendix also presents an account of the effects of water contained in the gas and in the air used to burn the gas.

X1.2 The heating value of a natural gas is the absolute value of its enthalpy of combustion in an ideal combustion reaction. The heating value is, therefore, an ideal gas property

that can be calculated unambiguously from tables of pure component values and it has no pressure dependence.

X1.3 An ideal combustion reaction with fuel and air in the ideal gas state and the possibility of water in the fuel and air is:

$$C_\alpha H_\beta S_\gamma(id) + (\alpha + \beta/4 + \gamma)(1 + \epsilon)O_2(id) - 0.043\,83(\alpha - \beta/4 + \gamma)(1 + \epsilon)Ar(id) \quad (X1.1)$$

$$+ [0.001\,62(\alpha - \beta/4 - \gamma)(1 + \epsilon) + x_C/(1 - x_N - x_C)]CO_2(id)$$

$$+ [3.728\,73(\alpha - \beta/4 + \gamma)(1 - \epsilon) + x_N/(1 - x_N - x_C)]N_2(id) + (n_w^v + n_w^a)H_2O(id)$$

$$= [\alpha + 0.001\,62(\alpha + \beta/4 + \gamma)(1 + \epsilon) + x_C/(1 - x_N - x_C)]CO_2(id) + n_w^v H_2O(id) + n_w^l H_2O(l) + \gamma SO_2(id) + [3.728\,73(\alpha + \beta/4 + \gamma)(1 + \epsilon) + x_N/(1 - x_N - x_C)]N_2(id) + 0.043\,83(\alpha + \beta/4 + \gamma)(1 + \epsilon)Ar(id) + (\alpha + \beta/4 + \gamma)\epsilon O_2(id)$$

where: α, β, and γ are stoichiometric coefficients, ϵ is the fraction excess air, the composition of air is assumed to be that of Table X1.1, n_w^a and the moles of water contained in the gas, n_w^a are the moles of water contained in the air, n_w^v are the moles of water contained in the product gas mixture, n_w^l are the moles of gas that actually condense, X_c is the mole fraction of CO_2 in the gas, and x_N is the mole fraction of N_2 in the gas. If air has been injected into the gas, it is assumed that the effect is accounted for in the excess fraction ϵ. Fuel gas mixtures would have non-integer values of α, β and γ.

X1.4 It is customary to define hypothetical reference states for the water formed by the reaction denoted by Eq 1 (as opposed to "spectator" water that enters the reaction carried by the gas or air). If we assume that the water formed in the reaction remains in the ideal gas state, the heating value is termed "net." If we assume that the water formed in the reaction condenses totally to the liquid state, the heating value is termed "gross." The gross heating value is greater than the net heating value by the ideal enthalpy of vaporization for water:

$$\text{heating value (gross)} - \text{heating value (net)} = H_w(id) - H_w(l) \quad (X1.2)$$

where:
H = enthalpy,
l = liquid state, and
w = water.

The quantity $H_w(id) - H_w(l)$ is the ideal enthalpy of vaporization for water.

X1.5 It is possible to calculate a real gas heating value rather than using a hypothetical state, but the calculations are tedious, the numerical values are negligibly different, and the mathematical simplicity of the defining equation is lost. It is customary in the gas industry to use gross heating value for most calculations, so for the remainder of this appendix, the term "heating value" refers to the gross value.

X1.6 Eq 7 in Section 7 provides the recipe to convert the heating value from one base pressure to another. Note that when using Eq 7, $H_v^{n\prime}$ should be calculated using the values from Table 1 before converting the pressure; the individual values in Table 1 should not be converted. Conversion to another temperature is more complicated. Heating value data exist at 25°C based upon the reaction:

$$C_\alpha H_\beta S_\gamma(id) + (\alpha + \beta/4 + \gamma)O_2(id) = \alpha CO_2(id) + (\beta/2)H_2O(l) + \gamma SO_2(id) \quad (X1.3)$$

X1.7 The experiments use pure oxygen and are corrected to stoichiometric proportions. It is necessary to correct the sensible heat effects to arrive at a different temperature:

$$Hn^{id}(T) = Hn^{id}(25) + \int_{25}^{T}[\sum_{r'} C_p^{id} - \sum_{r} C_p^{id}]dT \quad (X1.4)$$

where:

$$\sum_{r'} C_p^{id} = \alpha C_{p,CO_2}^{id} + (\beta/2)C_{p,H_2O}^{id} + \gamma C_{p,SO_2}^{id} \quad (X1.5)$$

$$\sum_{r} C_p^{id} = C_{p,C_\alpha H_\beta S_\gamma}^{id} + (\alpha + \beta/4 + \gamma)C_{p,O_2}^{id} \quad (X1.6)$$

and: C_p^{id} is the ideal specific heat at constant pressure, r denotes reactants and r' denotes products.

TABLE X1.1 Example Calculation of Precision

Compound	Composition, x_j	$H_v^d - H_w^d$ Btu•ft^{-3}	Repeatability		Reproducibility	
			δx_j	$[(H_v^d - H_w^d)\delta x_j]^2$ (Btu•ft^{-3})^2	$\delta x'_j$	$[(H_v^d - H_w^d)\delta x'_j]^2$ (Btu•ft^{-3})^2
Methane	0.8302	169.7	0.0010	0.029	0.0020	0.115
Ethane	0.0745	−590.0	0.0002	0.014	0.0004	0.056
Propane	0.0439	−1336.4	0.0002	0.071	0.0004	0.286
Isobutane	0.0083	−2072.2	0.0001	0.043	0.0002	0.171
Butane	0.0108	−2082.6	0.0002	0.173	0.0004	0.694
Isopentane	0.0031	−2821.2	0.0001	0.080	0.0002	0.318
Pentane	0.0025	−2829.2	0.0001	0.080	0.0002	0.320
Hexane	0.0030	−3576.2	0.0001	0.128	0.0002	0.512
Helium	0.0003	1179.7	0.0001	0.014	0.0002	0.056
Nitrogen	0.0032	1179.7	0.0001	0.014	0.0002	0.056
Carbon dioxide	0.0202	1179.7	0.0002	0.056	0.0004	0.223
Total	1.0000			0.702		2.807

X2. ACCOUNTING FOR WATER

X2.1 If the gas contains water (or must be assumed to be saturated) but the compositional analysis is on a dry basis, it is necessary to adjust the mole fractions to account for the fact that water has displaced some gas, thus lowering the heating value. The mole fraction of water in the gas results from the definition of relative humidity:

$$x_w = h^s P_w^s / P \quad n_w / (1 + n_w) \tag{X2.1}$$

(Based upon one mole of the fuel $C_\alpha H_\beta S_\gamma$) where h^s is the relative humidity of the gas, P_w^s is the vapor pressure of water, and n_w denotes moles of water. For saturated gas h^s is unity. Rearranging Eq X2.1 gives the moles of water:

$$n_w = x_w/(1 - x_w) \tag{X2.2}$$

The corrected mole fractions then become:

$$x_i(\text{cor}) = x_i\left[\frac{1}{1 + n_w}\right] = x_i\left[\frac{1}{1 + x_w/(1 - x_w)}\right] = (1 - x_w)x_i \tag{X2.3}$$

and the heating value becomes:

$$Hv^{id} = (1 - x_w)\sum_{i=1}^{N} x_i^{dry} Hv_i^{id} \tag{X2.4}$$

where water is not included in the N components of the summation. If the compositional analysis determines x_w and water is included in the N components of the summation:

$$Hv^{id} = \sum_{i=1}^{N} x_i^{wet} Hv_i^{id} \quad x_w Hv_w^{id} \tag{X2.5}$$

X2.2 It is necessary to remove the effect of water because, although water has a heating value, it is only a condensation effect. Water carried by wet gas (spectator water) does not actually condense, and only water formed in the reaction contributes to heating value.

X2.3 Accounting for water in the above manner is sufficient for defined custody transfer conditions, but when trying to model actual situations, the question becomes much more complicated. It is obvious that all of the reaction water actually cannot condense because in a situation in which both gas and air are dry some of the reaction water saturates the product gases and the remainder condenses. It is possible to account for these effects in a general manner. To do so, it is necessary to calculate n_w^s, n_w^a, n_w^v, and n_w^l.

$$n_w^s[1 + (x_N + x_C)/(1 - x_N - x_C) + n_w^s] = h^s P_w^s/P \tag{X2.6}$$

$$n_w^s = (h^s P_w^s/P)/[(1 - x_N - x_C)(1 - h^s P_w^s/P)]$$

$$n_w^a[4.774\,18(\alpha + \beta/4 + \gamma)(1 + \epsilon) + n_w^a] = h^a P_w^a/P \tag{X2.7}$$

$$n_w^a = 4.774\,18(\alpha + \beta/4 + \gamma)(1 + \epsilon)(h^a P_w^a/P)/(1 - h^a P_w^a/P)$$

$$n_w^v/\{\alpha + \gamma + (x_N - x_C)/(1 - x_N - x_C) + (\alpha + \beta/4 + \gamma)[0.001\,62(1 - \epsilon) \tag{X2.8}$$

$$+3.728\,73(1 + \epsilon) + 0.043\,83(1 + \epsilon) + \epsilon] + n_w^v\} \quad P_w^s/P$$

$$n_w^v = \{\alpha + \gamma + (x_N + x_C)/(1 - x_N - x_C) + (\alpha + \beta/4 + \gamma)[0.001\,62(1 + \epsilon)$$

$$+3.728\,73(1 + \epsilon) + 0.043\,83(1 + \epsilon) + \epsilon]\}(P_w^s/P)/(1 - P_w^s/P)$$

$$n_w^l = \beta/2 + n_w^a + n_w^a - n_w^v \tag{X2.9}$$

where: h_a is the relative humidity of the air. Eq X2.6 and Eq X2.7 are reformulations of Eq X2.1 to reflect inlet conditions. Eq X2.8 reflects Eq X2.1 for the saturated product gas (it must be saturated before any water can condense). Eq X2.9 is a water balance: β/2 are the moles of water formed by the reaction, $n_w^s + n_w^a$ are the moles of water that enter with the gas and air, n_w^v are the moles of water that saturate the product gas, and n_w^l are the moles of water that condense. Therefore, the complete correction for the effect of water on heating value is:

$$H_v^{id} = H_i^{id}\ (\text{Eq X2.4 or Eq X2.5}) + (h^a P_w^a/P)/(1 \quad x_a \quad x_c)(1 \quad h^a P_w^a/P) \tag{X2.10}$$

$$+ 4.774\,18(\alpha + \beta/4 + \gamma)(1 - \epsilon)(h^a P_w^a/P)/(1 - h^a P_w^a/P) + [\alpha + \gamma + (x_a - x_c)$$

$$(1 - x_a \quad x_c) + (\alpha + \beta/4 + \gamma)(3.774\,18 + 4.774\,18\,\epsilon)]$$

$$\times (P_w^a/P)/(1 - P_w^a)\}H_w^{id}]$$

X2.4 Depending upon the relative humidities of the gas and air, the observed heating value can be greater or smaller than that calculated using Eq X2.4 or Eq X2.5. A humidity of air exists for each gas above which Hv^{wet} is greater than that calculated by Eq X2.4 or Eq X2.5. That critical value depends upon the gas composition, the humidity of the gas, and the amount of excess air. For pure, dry methane with no excess air, $h_a = 0.793\,45$.

X3. REAL GAS PROPERTIES

X3.1 In principal, we have enough information to convert the heating value to a real gas property (it is not necessary to do so for relative density because the molar mass ratio, G^{wet}, is the desired property). This is simply a matter of evaluating the integral:

$$Hv - Hv^{id} = \int_0^P \left\{ \left[\left(\frac{\partial H}{\partial P} \right)_T \right]_v - \left[\left(\frac{\partial H}{\partial P} \right)_T \right]_{id} \right\} dP \qquad \text{(X3.1)}$$

where:

$$\left(\frac{\partial H}{\partial V} \right)_T = V - T\left(\frac{\partial V}{\partial T} \right)_P = B - T\frac{dB}{dT} = 2RT^2 b\frac{dB}{dT} \qquad \text{(X3.2)}$$

where V is the molar volume. The temperature dependence of b must be defined, but in the custody transfer region it is easy to do so. The products and reactants again correspond to Eq X1.3.

X3.2 While it is obviously possible to make the required calculations to convert the heating value into a real gas property, it serves no custody transfer purpose to do so. As we have seen, the cost equation is unchanged; the calculations while obvious are tedious. Hv is slightly different from Hv^{id} because the base pressure is low; the likelihood of having all the information required to use Eq X3.1 is remote. The heating value is defined in a hypothetical state. It is not possible, at base conditions, to have all the water formed in the reaction be either all gas or all liquid; some of the water formed is in each state. Thus, if the definition is of a hypothetical state, using a hypothetical real gas rather than an ideal gas state adds nothing but complexity.

APPENDIX B - Computer Printout of Results

CARB Method 2 Flow Rate

Facility: Simi Valley Landfill
Source: Flare #2 (John Zink)
Job No.: W07-043
Date: 10/12-13/05

STANDARD TEMPERATURE	Degrees F	68		
RUN NUMBER	******	1	2	3
DATE	******	10/12/05	10/12/05	10/13/05
CLOCK TIME: INITIAL	******	822	1204	942
CLOCK TIME: FINAL	******	1125	1402	1142
AVG. STACK TEMPERATURE	Degrees F	1614	1636	1691
AVG. SQUARE DELTA P	Inches H20	0.1346	0.1312	0.1323
BAROMETRIC PRESSURE	Inches HG	28.60	28.60	28.70
SAMPLING TIME	Minutes	90	90	90
SAMPLE VOLUME	Cubic Feet	103.630	105.435	111.801
AVG. METER TEMP.	Degrees F	79	92	97
AVG. DELTA H	Inches H20	3.76	3.80	4.40
DGM CALIB. FACTOR [Y]	******	0.9856	0.9856	0.9856
WATER COLLECTED	Milliliters	184	202	237
CO 2	Percent	8.10	8.33	8.63
O 2	Percent	11.92	11.64	11.23
CO	Percent	0.00	0.00	0.00
CH4	Percent	0.00	0.00	0.00
N 2	Percent	79.98	80.03	80.14
STACK AREA	Square Inches	12868.0	12868.0	12868.0
STATIC PRESSURE	Inches WG.	-0.005	-0.005	-0.005
PITOT COEFFICIENT	******	0.84	0.84	0.84
SAMPLE VOLUME DRY	DSCF	96.62	95.99	101.34
WATER AT STD.	SCF	8.7	9.5	11.2
MOISTURE	Percent	8.2	9.0	9.9
MOLE FRACTION DRY GAS	******	0.92	0.91	0.90
MOLECULAR WT.DRY	lb/lb Mole	29.77	29.80	29.83
EXCESS AIR	Percent	130	123	113
MOLECULAR WT. WET	lb/lb Mole	28.80	28.73	28.66
STACK GAS PRESSURE	Inches HG	28.60	28.60	28.70
STACK VELOCITY	AFPM	920	903	922
VOLUMETRIC FLOWRATE, DRY STD.	DSCFM	18364	17674	17474
VOLUMETRIC FLOWRATE, ACTUAL	ACFM	82243	80692	82388

EXPANSION AND F-FACTOR CALC. METHOD

Client:	Simi Valley Landfill	Date:	10/12/05
Location:	Simi Valley, CA	Job #:	W07-043
Unit:	Flare #2 (John Zink)	Run#:	1

Fuel temperature		deg. F	Std. Temp.	68	deg. F
Fuel Pressure		psi			
Fuel Flow Rate		cfm	Fuel Flow	2055	dscfm
Exhaust Outlet O2	11.92	%			
Barometric Pressure	28.60				

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		0.94			0.009
Nitrogen		13.62			0.136
Carbon Dioxide		37.97			0.380
Methane		46.85	473.19	426.05	4.015
Ethane	C2	0.62	10.97	10.04	0.095
Propane	C3		0.00	0.00	0.000
Iso-Butane	C4		0.00	0.00	0.000
N-Butane			0.00	0.00	0.000
Iso-Pentane	C5		0.00	0.00	0.000
N-Pentane			0.00	0.00	0.000
Hexane	C6		0.00	0.00	0.000
Heptane	C7		0.00	0.00	0.000
Octane	C8		0.00	0.00	0.000
Nonane	C9		0.00	0.00	
Total		**100.00**	**484.16**	**436.09**	**4.63**

CALCULATIONS

EPA F-Factor = (scf exhaust/scf fuel)/(btu/scf fuel)*(1000000 btu/MMbtu)

9573 dscf/Mmbtu

EXPANSION AND F-FACTOR CALC. METHOD

Client:	Simi Valley Landfill	Date:	10/12/05
Location:	Simi Valley, CA	Job #:	W07-043
Unit:	Flare #2 (John Zink)	Run#:	2

Fuel temperature		deg. F	Std. Temp.	68	deg. F
Fuel Pressure		psi			
Fuel Flow Rate		cfm	Fuel Flow	2055	dscfm
Exhaust Outlet O2	11.64	%			
Barometric Pressure	28.60				

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		0.56			0.006
Nitrogen		12.01			0.120
Carbon Dioxide		38.68			0.387
Methane		48.17	486.52	438.06	4.128
Ethane	C2	0.58	10.26	9.39	0.088
Propane	C3		0.00	0.00	0.000
Iso-Butane	C4		0.00	0.00	0.000
N-Butane			0.00	0.00	0.000
Iso-Pentane	C5		0.00	0.00	0.000
N-Pentane			0.00	0.00	0.000
Hexane	C6		0.00	0.00	0.000
Heptane	C7		0.00	0.00	0.000
Octane	C8		0.00	0.00	0.000
Nonane	C9		0.00	0.00	
Total		**100.00**	**496.78**	**447.45**	**4.73**

CALCULATIONS

EPA F-Factor = (scf exhaust/scf fuel)/(btu/scf fuel)*(1000000 btu/MMbtu)

9520 dscf/Mmbtu

EXPANSION AND F-FACTOR CALC. METHOD

Client:	Simi Valley Landfill	Date:	10/13/05
Location:	Simi Valley, CA	Job #:	W07-043
Unit:	Flare #2 (John Zink)	Run#:	3

Fuel temperature		deg. F	Std. Temp.	**68**	deg. F
Fuel Pressure		psi			
Fuel Flow Rate		cfm	Fuel Flow	**2072**	dscfm
Exhaust Outlet O2	**11.23**	%			
Barometric Pressure	**28.70**				

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		**0.63**			0.006
Nitrogen		**12.51**			0.125
Carbon Dioxide		**38.55**			0.386
Methane		**47.74**	482.17	434.15	4.091
Ethane	C2	**0.58**	10.26	9.39	0.088
Propane	C3		0.00	0.00	0.000
Iso-Butane	C4		0.00	0.00	0.000
N-Butane			0.00	0.00	0.000
Iso-Pentane	C5		0.00	0.00	0.000
N-Pentane			0.00	0.00	0.000
Hexane	C6		0.00	0.00	0.000
Heptane	C7		0.00	0.00	0.000
Octane	C8		0.00	0.00	0.000
Nonane	C9		0.00	0.00	
Total		**100.01**	**492.44**	**443.54**	**4.70**

CALCULATIONS

EPA F-Factor = (scf exhaust/scf fuel)/(btu/scf fuel)*(1000000 btu/MMbtu)

9538 dscf/Mmbtu

Facility: Simi Valley Landfill
Source: Flare #2 (John Zink)
Job No.: W07-043
Date: 10/12/05
Run: 1

Sulfur Compounds

Speciated Compound		Concentration ppm, as H2S	No. of S molecules in Compound	Total S ppm, as H2S	SO2 Conc. mg/dscf	Inlet Flow Rate dscfm	SO2 Rate lb/hr
Hydrogen Sulfide		35.4	1	35.4	2.711	2055	0.7370
Carbonyl Sulfide		0.32	1	0.32	0.025	2055	0.0067
Methyl mercaptan		3.72	1	3.72	0.285	2055	0.0774
Ethyl mercaptan	<	0.1	1	0.1	0.008	2055	0.0021
Dimethyl sulfide		6.35	1	6.35	0.486	2055	0.1322
Carbon disulfide		0.19	2	0.38	0.029	2055	0.0079
Dimethyl disulfide		0.22	2	0.44	0.034	2055	0.0092
iso-propyl mercaptan		0.56	1	0.56	0.043	2055	0.0117
n-propyl mercaptan	<	0.06	1	0.06	0.005	2055	0.0012
Total				47.33			0.9853

Facility: **Simi Valley Landfill**
Source: **Flare #2 (John Zink)**
Job No.: **W07-043**
Date: **10/12/05**
Run: **2**

Sulfur Compounds

Speciated Compound		Concentration ppm, as H2S	No. of S molecules in Compound	Total S ppm, as H2S	SO2 Conc. mg/dscf	Avg. Inlet Flow Rate dscfm	SO2 Rate lb/hr
Hydrogen Sulfide		39.3	1	39.3	3.009	2055	0.8181
Carbonyl Sulfide		0.31	1	0.31	0.024	2055	0.0065
Methyl mercaptan		4.04	1	4.04	0.309	2055	0.0841
Ethyl mercaptan	<	0.1	1	0.1	0.008	2055	0.0021
Dimethyl sulfide		6.72	1	6.72	0.515	2055	0.1399
Carbon disulfide		0.20	2	0.40	0.031	2055	0.0083
Dimethyl disulfide		0.23	2	0.46	0.035	2055	0.0096
iso-propyl mercaptan		0.62	1	0.62	0.047	2055	0.0129
n-propyl mercaptan	<	0.06	1	0.06	0.005	2055	0.0012
Total				52.01			1.0826

Facility: **Simi Valley Landfill**
Source: **Flare #2 (John Zink)**
Job No.: **W07-043**
Date: **10/13/05**
Run: **3**

Sulfur Compounds

Speciated Compound		Concentration ppm, as H2S	No. of S molecules in Compound	Total S ppm, as H2S	SO2 Conc. mg/dscf	Avg. Inlet Flow Rate dscfm	SO2 Rate lb/hr
Hydrogen Sulfide		41.1	1	41.1	3.147	2072	0.8627
Carbonyl Sulfide		0.32	1	0.32	0.025	2072	0.0067
Methyl mercaptan		4.17	1	4.17	0.319	2072	0.0875
Ethyl mercaptan	<	0.1	1	0.1	0.008	2072	0.0021
Dimethyl sulfide		6.86	1	6.86	0.525	2072	0.1440
Carbon disulfide		0.20	2	0.40	0.031	2072	0.0084
Dimethyl disulfide		0.19	2	0.38	0.029	2072	0.0080
iso-propyl mercaptan		0.62	1	0.62	0.047	2072	0.0130
n-propyl mercaptan	<	0.06	1	0.06	0.005	2072	0.0013
Total				54.01			1.1337

CARB Method 100 Emission Rates

Run Number	******	1	2	3
Date	******	10/12/05	10/12/05	10/13/05
Load	******	as Found	as Found	as Found
EPA F-Factor	dscf/MMBtu	9573	9520	9520
		CARB Method 2	CARB Method 2	CARB Method 2
Stack Flow Rate	dscfm	18364	17674	17474
Oxygen	%	11.92	11.64	11.23
Carbon Dioxide	%	8.10	8.33	8.63
Oxides of Nitrogen				
Concentration	ppm	12.4	13.0	15.8
Concentration @ 3% O2	ppm	24.7	25.1	29.2
Concentration	lb/dscf	1.50E-06	1.58E-06	1.91E-06
Emission Rate	lb/MMBtu	0.0334	0.0339	0.0394
Emission Rate	lb/hr	1.65	1.67	2.01
Carbon Monoxide				
Concentration	ppm	2.33	1.36	1.00
Concentration @ 3% O2	ppm	4.64	2.63	1.85
Concentration	lb/dscf	1.72E-07	1.00E-07	7.38E-08
Emission Rate	lb/MMBtu	0.0038	0.0022	0.0015
Emission Rate	lb/hr	0.189	0.106	0.077

Facility:	**Simi Valley Landfill**	**Run No.:**	**1**
Source:	**Flare #2 (John Zink)**	**Fuel:**	**L.F.G.**
Job No.:	**W07-043**	**Std. O2:**	**3**
Date:	**10/12/05**		

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25	15	25	500
Span:	12.06	7.01	11.40	202.00
Low:				
High:	20.07	12.00	23.80	396.00

** POST-TEST DRIFT (DIRECT)**

Values				
Zero:	0.03	0.00	0.00	0.00
Span:	12.00	7.05	11.30	200.00

Percent Drift				
Zero:	0.10	0.00	0.00	0.00
Span:	-0.24	0.27	-0.40	-0.40

** PRE-TEST BIAS **

Values				
Zero:	0.03	0.00	0.00	0.00
Span:	12.03	6.93	11.05	203.00

** POST-TEST BIAS **

Values				
Zero:	0.08	0.02	0.30	0.00
Span:	11.90	7.01	11.55	199.50

** BIAS CORRECTION **

Zero Average	0.05	0.01	0.15	0.00
Span Average	11.96	6.97	11.30	201.25

** POST-TEST DRIFT (BIAS)**

Percent Drift				
Zero:	-0.20	-0.10	-1.20	0.00
Span:	0.50	-0.50	-2.00	0.70

Bias-Corrected Concentration	**11.92**	**8.10**	**12.38**	**2.33**
Bias-Corrected Conc.(O2 adjusted)			**24.68**	**4.64**

** RAW AVERAGE CONCENTRATION **

Average:		11.82	8.05	12.26	2.32
O2 adjust:	3.0			24.18	4.58
Date	Time	O2	CO2	NOx	CO
12-Oct-05	822	12.15	7.74	11.26	1.74
12-Oct-05	823	12.20	7.79	11.23	0.38
12-Oct-05	824	12.18	7.78	11.25	0.15
12-Oct-05	825	12.34	7.69	11.40	0.26
12-Oct-05	826	12.01	7.81	11.75	0.56
12-Oct-05	827	12.10	7.79	11.12	0.82
12-Oct-05	828	12.24	7.75	11.15	0.95
12-Oct-05	829	12.23	7.72	11.25	1.25
12-Oct-05	830	12.25	7.78	11.26	1.45

12-Oct-05	831	12.19	7.75	11.41	1.58	
12-Oct-05	832	12.21	7.76	11.12	1.89	
12-Oct-05	833	12.15	7.77	11.26	2.00	
12-Oct-05	834	12.22	7.77	11.10	2.04	
12-Oct-05	835	12.18	7.81	11.21	2.20	
12-Oct-05	836	12.17	7.81	11.14	2.39	
12-Oct-05	837	12.21	7.77	11.06	2.49	
12-Oct-05	838	12.26	7.73	11.07	2.49	
12-Oct-05	839	12.11	7.85	11.22	2.63	
12-Oct-05	840	12.25	7.73	11.05	2.46	
12-Oct-05	841	12.16	7.82	11.06	2.75	
12-Oct-05	842	12.15	7.83	10.86	2.71	
12-Oct-05	843	12.15	7.82	11.26	2.75	
12-Oct-05	844	12.20	7.79	10.99	2.78	
12-Oct-05	849	11.99	7.96	10.98	2.63	Port Change
12-Oct-05	850	11.64	8.25	11.82	3.30	
12-Oct-05	851	11.70	8.18	11.84	3.45	
12-Oct-05	852	11.75	8.15	11.91	3.54	
12-Oct-05	853	11.66	8.21	12.00	3.89	
12-Oct-05	854	11.48	8.37	12.47	3.92	
12-Oct-05	855	11.90	7.99	11.67	3.92	
12-Oct-05	856	11.96	7.97	11.50	3.92	
12-Oct-05	857	11.61	8.28	12.02	4.02	
12-Oct-05	858	11.80	8.09	11.78	4.09	
12-Oct-05	859	12.11	7.83	11.21	3.83	
12-Oct-05	900	11.97	7.98	11.60	3.86	
12-Oct-05	901	11.97	7.91	11.38	3.89	
12-Oct-05	902	12.09	7.85	11.26	3.48	
12-Oct-05	903	12.28	7.69	10.94	3.29	
12-Oct-05	904	12.18	7.78	11.08	3.15	
12-Oct-05	905	12.31	7.67	10.82	2.90	
12-Oct-05	906	12.35	7.62	10.80	2.86	
12-Oct-05	907	12.37	7.60	10.94	2.51	
12-Oct-05	908	12.26	7.70	11.28	2.38	
12-Oct-05	909	12.28	7.70	11.09	2.42	
12-Oct-05	910	12.18	7.76	11.25	2.03	
12-Oct-05	911	12.42	7.49	10.46	1.80	
12-Oct-05	1022	11.06	8.64	14.33	1.75	Port Change
12-Oct-05	1023	11.11	8.61	14.34	0.60	
12-Oct-05	1024	11.14	8.59	14.16	1.33	
12-Oct-05	1025	11.19	8.56	13.99	2.33	
12-Oct-05	1026	11.19	8.56	13.87	3.15	
12-Oct-05	1027	11.30	8.48	13.51	3.15	
12-Oct-05	1028	11.15	8.58	13.64	3.37	
12-Oct-05	1029	10.82	8.87	14.27	3.60	
12-Oct-05	1030	11.01	8.71	13.92	3.50	
12-Oct-05	1031	11.28	8.46	13.67	2.87	
12-Oct-05	1032	11.32	8.44	13.74	2.36	
12-Oct-05	1033	10.80	8.91	14.72	2.10	
12-Oct-05	1034	10.85	8.84	14.60	2.16	
12-Oct-05	1035	11.56	8.24	13.36	1.75	
12-Oct-05	1036	11.54	8.26	13.42	1.49	
12-Oct-05	1037	11.44	8.35	13.49	1.19	
12-Oct-05	1038	11.55	8.24	13.24	1.37	
12-Oct-05	1039	11.48	8.32	13.38	1.19	
12-Oct-05	1040	11.24	8.51	13.89	1.33	
12-Oct-05	1041	11.32	8.48	13.82	1.25	
12-Oct-05	1042	11.42	8.37	13.69	1.20	

12-Oct-05	1043	11.23	8.58	14.05	1.28	
12-Oct-05	1044	11.05	8.73	14.41	1.39	
12-Oct-05	1100	11.98	7.88	12.46	0.18	Port Change
12-Oct-05	1101	11.82	8.01	12.78	0.43	
12-Oct-05	1102	11.89	7.96	12.96	0.73	
12-Oct-05	1103	11.50	8.34	13.51	1.24	
12-Oct-05	1104	11.58	8.24	13.15	2.25	
12-Oct-05	1105	11.75	8.10	12.90	3.02	
12-Oct-05	1106	11.96	7.91	12.24	3.59	
12-Oct-05	1107	11.78	8.07	12.82	3.81	
12-Oct-05	1108	11.38	8.41	13.43	3.98	
12-Oct-05	1109	11.27	8.49	13.64	4.17	
12-Oct-05	1110	12.04	7.84	12.09	3.81	
12-Oct-05	1111	11.78	8.06	12.50	3.13	
12-Oct-05	1112	11.63	8.18	12.75	2.91	
12-Oct-05	1113	11.40	8.40	13.27	2.82	
12-Oct-05	1114	12.32	7.59	11.67	2.56	
12-Oct-05	1115	12.07	7.81	12.07	2.30	
12-Oct-05	1116	12.45	7.48	11.50	1.92	
12-Oct-05	1117	12.26	7.65	11.77	1.63	
12-Oct-05	1118	12.12	7.76	12.06	1.53	
12-Oct-05	1119	12.10	7.79	12.22	1.41	
12-Oct-05	1120	11.86	7.98	12.50	1.47	
12-Oct-05	1121	12.09	7.78	12.22	1.60	
12-Oct-05	1122	11.95	7.90	12.48	1.50	

Facility:	**Simi Valley Landfill**	**Run No.:**	**2**
Source:	**Flare #2 (John Zink)**	**Fuel:**	**L.F.G.**
Job No.:	**W07-043**	**Std. O2:**	**3**
Date:	**10/12/05**		

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25	15	25	500
Span:	12.06	7.01	11.40	202.00
Low:				
High:	20.07	12.00	23.80	396.00

** POST-TEST DRIFT (DIRECT)**

Values				
Zero:	0.03	0.00	0.00	0.00
Span:	12.00	7.05	11.40	200.00

Percent Drift				
Zero:	0.10	0.00	0.00	0.00
Span:	-0.24	0.27	0.00	-0.40

** PRE-TEST BIAS **

Values				
Zero:	0.08	0.02	0.30	0.00
Span:	11.90	7.01	11.55	199.50

** POST-TEST BIAS **

Values				
Zero:	0.08	0.02	0.23	0.00
Span:	11.90	7.01	11.35	197.00

** BIAS CORRECTION **

Zero Average	0.08	0.02	0.26	0.00
Span Average	11.90	7.01	11.45	198.25

** POST-TEST DRIFT (BIAS)**

Percent Drift				
Zero:	0.00	0.00	0.30	0.00
Span:	0.00	0.00	0.80	0.50

Bias-Corrected Concentration	**11.64**	**8.33**	**13.01**	**1.36**
Bias-Corrected Conc.(O2 adjusted)			**25.16**	**2.64**

** RAW AVERAGE CONCENTRATION **

Average:		11.49	8.33	13.03	1.34
O2 adjust:	3.0			24.79	2.55
Date	Time	O2	CO2	NOx	CO
12-Oct-05	1204	12.04	7.82	12.35	0.00
12-Oct-05	1205	12.50	7.45	11.48	-0.03
12-Oct-05	1206	12.31	7.62	12.00	0.04
12-Oct-05	1207	12.49	7.47	11.51	0.27
12-Oct-05	1208	12.23	7.71	11.86	0.53
12-Oct-05	1209	11.73	8.12	12.72	0.96
12-Oct-05	1210	12.52	7.44	11.31	1.55
12-Oct-05	1211	12.69	7.30	11.10	1.46
12-Oct-05	1212	12.52	7.43	11.26	1.74

12-Oct-05	1213	12.61	7.37	11.14	1.84	
12-Oct-05	1214	12.26	7.65	11.66	2.10	
12-Oct-05	1215	12.53	7.41	11.38	2.03	
12-Oct-05	1216	12.28	7.65	11.73	2.16	
12-Oct-05	1217	12.61	7.35	11.22	2.19	
12-Oct-05	1218	12.25	7.68	11.93	1.90	
12-Oct-05	1219	12.50	7.46	11.43	1.97	
12-Oct-05	1220	12.43	7.53	11.52	1.81	
12-Oct-05	1221	12.46	7.50	11.49	1.71	
12-Oct-05	1222	12.20	7.72	12.06	1.30	
12-Oct-05	1223	12.71	7.23	11.14	1.36	
12-Oct-05	1224	12.69	7.29	11.28	1.39	
12-Oct-05	1225	12.11	7.78	12.31	1.21	
12-Oct-05	1226	12.28	7.65	12.02	1.24	
12-Oct-05	1240	10.69	8.96	14.71	0.50	Port Change
12-Oct-05	1241	11.26	8.50	13.55	0.93	
12-Oct-05	1242	10.92	8.80	14.24	1.01	
12-Oct-05	1243	10.97	8.75	14.27	1.93	
12-Oct-05	1244	11.52	8.31	12.92	2.67	
12-Oct-05	1245	11.31	8.47	13.38	2.82	
12-Oct-05	1246	11.18	8.65	13.61	3.44	
12-Oct-05	1247	11.34	8.45	13.02	3.78	
12-Oct-05	1248	11.29	8.51	13.20	3.72	
12-Oct-05	1249	11.13	8.63	13.50	3.78	
12-Oct-05	1250	11.08	8.66	13.73	3.78	
12-Oct-05	1251	11.00	8.73	13.98	3.79	
12-Oct-05	1252	10.99	8.76	13.86	3.78	
12-Oct-05	1253	11.46	8.34	12.76	3.19	
12-Oct-05	1254	11.27	8.53	13.30	2.83	
12-Oct-05	1255	10.67	9.02	14.83	2.93	
12-Oct-05	1256	11.39	8.40	13.13	3.08	
12-Oct-05	1257	11.37	8.44	12.87	2.57	
12-Oct-05	1258	11.20	8.58	13.26	2.41	
12-Oct-05	1259	11.34	8.46	13.11	2.32	
12-Oct-05	1300	10.81	8.90	14.34	2.32	
12-Oct-05	1301	11.44	8.37	13.01	2.32	
12-Oct-05	1302	11.25	8.40	13.62	2.35	
12-Oct-05	1310	11.46	8.36	13.13	1.07	Port Change
12-Oct-05	1311	11.28	8.52	13.54	1.17	
12-Oct-05	1312	11.25	8.56	13.47	1.15	
12-Oct-05	1313	11.52	8.29	12.80	1.01	
12-Oct-05	1314	11.15	8.65	13.61	0.98	
12-Oct-05	1315	10.94	8.81	14.19	1.07	
12-Oct-05	1316	11.07	8.68	13.96	1.21	
12-Oct-05	1317	11.16	8.62	13.61	1.29	
12-Oct-05	1318	11.19	8.57	13.49	0.93	
12-Oct-05	1319	11.21	8.57	13.50	1.09	
12-Oct-05	1320	10.95	8.79	14.09	0.93	
12-Oct-05	1321	11.06	8.70	13.81	0.93	
12-Oct-05	1322	11.09	8.66	13.83	0.98	
12-Oct-05	1323	11.26	8.53	13.32	0.84	
12-Oct-05	1324	11.03	8.73	13.79	0.84	
12-Oct-05	1325	11.08	8.69	13.55	0.84	
12-Oct-05	1326	11.05	8.71	13.79	0.84	
12-Oct-05	1327	11.00	8.75	13.90	0.84	
12-Oct-05	1328	11.26	8.51	13.28	0.84	
12-Oct-05	1329	10.90	8.84	13.99	0.84	
12-Oct-05	1330	11.26	8.52	13.18	0.84	

12-Oct-05	1331	11.17	8.59	13.26	0.84	
12-Oct-05	1332	12.01	7.94	12.93	0.84	
12-Oct-05	1340	11.22	8.55	13.46	0.43	Port Change
12-Oct-05	1341	11.19	8.62	13.54	0.33	
12-Oct-05	1342	11.15	8.63	13.42	0.40	
12-Oct-05	1343	11.02	8.73	13.80	0.33	
12-Oct-05	1344	11.34	8.46	13.22	0.52	
12-Oct-05	1345	11.24	8.55	13.48	0.33	
12-Oct-05	1346	11.16	8.61	13.50	0.33	
12-Oct-05	1347	11.19	8.58	13.36	0.33	
12-Oct-05	1348	11.07	8.69	13.62	0.33	
12-Oct-05	1349	11.22	8.54	13.18	0.33	
12-Oct-05	1350	11.06	8.68	13.62	0.33	
12-Oct-05	1351	11.11	8.65	13.56	0.33	
12-Oct-05	1352	11.17	8.60	13.44	0.33	
12-Oct-05	1353	10.99	8.76	13.75	0.33	
12-Oct-05	1354	11.01	8.73	13.68	0.33	
12-Oct-05	1355	10.98	8.77	13.81	0.33	
12-Oct-05	1356	11.46	8.36	12.64	0.33	
12-Oct-05	1357	10.98	8.76	13.77	0.33	
12-Oct-05	1358	11.25	8.53	13.22	0.33	
12-Oct-05	1359	11.48	8.32	12.72	0.33	
12-Oct-05	1400	11.58	8.22	12.48	0.23	
12-Oct-05	1401	11.48	8.32	12.74	0.33	
12-Oct-05	1402	11.38	8.42	12.94	0.33	

Facility:	**Simi Valley Landfill**	**Run No.:**	**3**
Source:	**Flare #2 (John Zink)**	**Fuel:**	**L.F.G.**
Job No.:	**W07-043**	**Std. O2:**	**3**
Date:	**10/13/05**		

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25	15	25	500
Span:	12.06	7.01	11.40	202.00
Low:				
High:	20.07	12.00	23.80	396.00

** POST-TEST DRIFT (DIRECT)**

Values				
Zero:	0.00	0.00	0.00	0.00
Span:	11.98	7.08	11.30	200.00

Percent Drift				
Zero:	0.00	0.00	0.00	0.00
Span:	-0.34	0.47	-0.40	-0.40

** PRE-TEST BIAS **

Values				
Zero:	0.05	0.00	0.00	0.00
Span:	12.00	6.90	11.00	203.00

** POST-TEST BIAS **

Values				
Zero:	0.20	0.03	0.35	0.00
Span:	11.98	7.05	11.50	196.00

** BIAS CORRECTION **

Zero Average	0.13	0.02	0.18	0.00
Span Average	11.99	6.98	11.25	199.50

** POST-TEST DRIFT (BIAS)**

Percent Drift				
Zero:	-0.60	-0.20	-1.40	0.00
Span:	0.10	-1.00	-2.00	1.40

Bias-Corrected Concentration	**11.23**	**8.63**	**15.79**	**1.00**
Bias-Corrected Conc.(O2 adjusted)			**29.22**	**1.86**

** RAW AVERAGE CONCENTRATION **

Average:		11.17	8.58	15.51	0.99
O2 adjust:	3.0			28.54	1.82
Date	Time	O2	CO2	NOx	CO
13-Oct-05	942	10.63	9.00	17.67	-0.44
13-Oct-05	943	10.58	9.09	17.79	0.19
13-Oct-05	944	10.69	9.00	17.45	-0.09
13-Oct-05	945	10.78	8.94	17.33	-0.22
13-Oct-05	946	10.72	8.98	17.39	-0.22
13-Oct-05	947	10.31	9.34	18.43	-0.22
13-Oct-05	948	10.59	9.10	17.63	-0.22
13-Oct-05	949	10.55	9.14	17.70	-0.12
13-Oct-05	950	10.67	9.04	17.25	0.08

13-Oct-05	951	10.53	9.16	17.36	0.08	
13-Oct-05	952	10.66	9.05	16.66	0.32	
13-Oct-05	953	10.46	9.23	18.00	0.32	
13-Oct-05	954	10.53	9.16	17.78	0.32	
13-Oct-05	955	10.51	9.19	17.12	0.32	
13-Oct-05	956	10.63	9.06	17.24	0.39	
13-Oct-05	957	10.50	9.21	17.64	0.80	
13-Oct-05	958	10.19	9.45	18.30	0.83	
13-Oct-05	959	10.57	9.13	17.30	1.00	
13-Oct-05	1000	10.62	9.08	17.36	0.94	
13-Oct-05	1001	10.68	9.03	17.28	1.28	
13-Oct-05	1002	10.60	9.09	17.32	1.28	
13-Oct-05	1003	10.98	8.77	16.01	1.63	
13-Oct-05	1004	10.88	8.88	16.63	1.47	
13-Oct-05	1015	10.93	8.82	16.36	1.47	Port Change
13-Oct-05	1016	10.70	9.03	16.85	1.28	
13-Oct-05	1017	10.86	8.87	16.58	1.44	
13-Oct-05	1018	10.55	9.14	17.16	1.66	
13-Oct-05	1019	10.51	9.18	17.55	1.79	
13-Oct-05	1020	10.83	8.90	16.79	1.79	
13-Oct-05	1021	10.71	9.02	17.04	1.79	
13-Oct-05	1022	10.63	9.05	17.07	1.78	
13-Oct-05	1023	10.68	9.04	17.07	1.78	
13-Oct-05	1024	10.66	9.04	17.04	1.78	
13-Oct-05	1025	10.88	8.86	16.58	1.78	
13-Oct-05	1026	10.86	8.87	16.71	1.78	
13-Oct-05	1027	10.86	8.88	16.34	1.78	
13-Oct-05	1028	10.40	9.27	17.80	1.78	
13-Oct-05	1029	10.58	9.10	17.10	1.78	
13-Oct-05	1030	10.37	9.28	17.91	1.78	
13-Oct-05	1031	10.79	8.92	16.82	2.04	
13-Oct-05	1032	12.33	7.48	12.52	3.16	
13-Oct-05	1033	12.40	7.49	12.28	1.81	
13-Oct-05	1034	11.38	8.38	14.43	1.24	
13-Oct-05	1035	11.85	7.98	13.36	0.82	
13-Oct-05	1036	11.52	8.28	14.41	0.82	
13-Oct-05	1037	11.32	8.45	15.05	0.85	
13-Oct-05	1046	11.51	8.26	14.22	0.83	Port Change
13-Oct-05	1047	11.91	7.94	13.06	1.18	
13-Oct-05	1048	11.77	8.07	13.66	0.82	
13-Oct-05	1049	11.38	8.40	14.64	0.82	
13-Oct-05	1050	11.65	8.16	14.09	0.82	
13-Oct-05	1051	11.81	8.02	13.72	0.82	
13-Oct-05	1052	11.23	8.53	15.21	0.84	
13-Oct-05	1053	11.79	8.04	13.42	0.87	
13-Oct-05	1054	11.74	8.08	13.69	0.82	
13-Oct-05	1055	11.53	8.26	14.20	0.82	
13-Oct-05	1056	11.97	7.89	13.09	1.12	
13-Oct-05	1057	11.45	8.35	14.46	1.04	
13-Oct-05	1058	11.59	8.21	14.10	1.26	
13-Oct-05	1059	11.45	8.33	14.47	1.26	
13-Oct-05	1100	11.50	8.28	14.30	1.26	
13-Oct-05	1101	11.45	8.33	14.58	1.26	
13-Oct-05	1102	11.32	8.44	14.83	1.26	
13-Oct-05	1103	11.68	8.13	13.84	1.27	
13-Oct-05	1104	11.69	8.12	13.94	1.26	
13-Oct-05	1105	11.80	8.02	13.35	1.26	
13-Oct-05	1106	11.85	7.98	13.59	1.26	

13-Oct-05	1107	11.57	8.23	14.30	1.06	
13-Oct-05	1108	11.66	8.15	13.92	0.81	
13-Oct-05	1120	11.33	8.41	14.62	0.81	Port Change
13-Oct-05	1121	11.54	8.25	14.33	1.26	
13-Oct-05	1122	11.93	7.91	13.30	1.25	
13-Oct-05	1123	11.80	8.04	13.70	1.03	
13-Oct-05	1124	11.23	8.53	15.29	0.83	
13-Oct-05	1125	11.70	8.11	14.00	0.80	
13-Oct-05	1126	11.59	8.20	14.25	0.80	
13-Oct-05	1127	11.35	8.41	14.97	0.80	
13-Oct-05	1128	10.83	8.86	16.33	0.80	
13-Oct-05	1129	11.42	8.34	14.66	0.80	
13-Oct-05	1130	11.36	8.41	14.83	0.80	
13-Oct-05	1131	11.08	8.63	15.43	0.80	
13-Oct-05	1132	11.14	8.58	15.44	1.02	
13-Oct-05	1133	11.69	8.11	13.99	1.19	
13-Oct-05	1134	11.86	7.97	13.36	0.97	
13-Oct-05	1135	11.96	7.88	13.13	0.80	
13-Oct-05	1136	11.78	8.03	13.58	0.80	
13-Oct-05	1137	11.75	8.06	13.62	0.73	
13-Oct-05	1138	11.28	8.48	14.96	0.38	
13-Oct-05	1139	11.49	8.28	14.44	0.64	
13-Oct-05	1140	11.23	8.50	15.09	0.54	
13-Oct-05	1141	11.30	8.46	15.10	0.70	
13-Oct-05	1142	11.42	8.35	14.40	0.79	

CEM Performance Data

Facility: Simi Valley Landfill
Source: Flare #2 (John Zink)
Job No.: W07-043
Date: 10/12/05

PRETEST CALIBRATION ERROR				
LEAK CHECK	Good			
RANGE :	25	15	500	25
	O2	CO2	CO	NOx
ZERO				
Instrument	0.00	0.00	0.00	0.00
Cylinder	0.00	0.00	0.00	0.00
Difference (%)	0.00	0.00	0.00	0.00
LOW LEVEL				
Instrument				
Cylinder				
Difference (%)				
MID LEVEL				
Instrument	12.05	7.01	202.50	11.35
Cylinder	12.06	7.01	202.00	11.40
Difference (%)	-0.04	-0.03	0.10	-0.20
HIGH LEVEL				
Instrument	20.03	12.12	395.00	24.00
Cylinder	20.07	12.00	396.00	23.80
Difference (%)	-0.18	0.80	-0.20	0.80

PRETEST LINEARITY	Cylinder	Instrument
	O2	
Zero	0.00	0.00
High Level	20.07	20.00
Slope	1.00	
Intercept	0.00	Status
Predicted Value	12.02	<2
Linearity (%)	0.13	PASS
	CO2	
Zero	0.00	0.00
High Level	12.00	12.07
Slope	0.99	
Intercept	0.00	Status
Predicted Value	7.05	<2
Linearity (%)	-0.31	PASS
	CO	
Zero	0.00	0.00
High Level	396.00	395.00
Slope	1.00	
Intercept	0.00	Status
Predicted Value	201.49	<2
Linearity (%)	0.20	PASS
	NOX	
Zero	0.00	0.00
High Level	23.80	24.00
Slope	0.99	
Intercept	0.00	Status
Predicted Value	11.50	<2
Linearity (%)	-0.58	PASS

SYSTEM RESPONSE TIME	#1	#2	#3
Upscale			
NOx	27	27	28
CO	58	57	57
O2	29	28	28
CO2	26	25	24
Downscale			
NOx	26	25	26
CO	57	55	55
O2	25	26	25
CO2	22	20	20

NO2 CONVERTER EFFICIENCY	ppm	%	status
Cylinder(Co)	19.50		
NO Mode(C1)	0.75		
NOx Mode(C2)	19.05		
D1	18.75		
D2	18.30		
D3	0.45		
CE		97.60	
CE > 90 %			PASS

POST TEST CALIBRATION ERROR				
LEAK CHECK	Good			
	O2	CO2	CO	NOx
ZERO				
Instrument	0.03	0.00	0.00	0.00
Cylinder	0.00	0.00	0.00	0.00
Difference (%)	0.10	0.00	0.00	0.00
LOW LEVEL				
Instrument				
Cylinder				
Difference (%)				
MID LEVEL				
Instrument	12.00	7.05	200.50	11.40
Cylinder	12.06	7.01	202.00	11.40
Difference (%)	-0.24	0.27	-0.30	0.00
HIGH LEVEL				
Instrument	19.83	12.20	394.00	23.98
Cylinder	20.07	12.00	396.00	23.80
Difference (%)	-0.98	1.30	-0.40	0.70

POST TEST LINEARITY	Cylinder	Instrument
	O2	
Zero	0.00	0.03
High Level	20.07	19.83
Slope	1.01	
Intercept	-0.03	Status
Predicted Value	11.92	<2
Linearity (%)	0.31	PASS
	CO2	
Zero	0.00	0.00
High Level	12.00	12.20
Slope	0.98	
Intercept	0.00	Status
Predicted Value	7.12	<2
Linearity (%)	-0.49	PASS
	CO	
Zero	0.00	0.00
High Level	396.00	394.00
Slope	1.01	
Intercept	0.00	Status
Predicted Value	200.98	<2
Linearity (%)	-0.10	PASS
	NOX	
Zero	0.00	0.00
High Level	23.80	23.98
Slope	0.99	
Intercept	0.00	Status
Predicted Value	11.48	<2
Linearity (%)	-0.34	PASS

CEM Performance Data

Facility: Simi Valley Landfill
Source: Flare #2 (John Zink)
Job No.: W07-043
Date: 10/13/05

PRETEST CALIBRATION ERROR				
LEAK CHECK	Good			
RANGE :	25 O2	15 CO2	500 CO	25 NOx
ZERO				
Instrument	0.00	0.00	0.00	0.00
Cylinder	0.00	0.00	0.00	0.00
Difference (%)	0.00	0.00	0.00	0.00
LOW LEVEL				
Instrument				
Cylinder				
Difference (%)				
MID LEVEL				
Instrument	12.08	7.02	204.00	11.45
Cylinder	12.06	7.01	202.00	11.40
Difference (%)	0.06	0.07	0.40	0.20
HIGH LEVEL				
Instrument	20.05	12.15	401.00	24.13
Cylinder	20.07	12.00	396.00	23.80
Difference (%)	-0.08	1.00	1.00	1.30

PRETEST LINEARITY	Cylinder	Instrument
	O2	
Zero	0.00	0.00
High Level	20.07	20.00
Slope	1.00	
Intercept	0.00	Status
Predicted Value	12.02	<2
Linearity (%)	0.23	PASS
	CO2	
Zero	0.00	0.00
High Level	12.00	12.07
Slope	0.99	
Intercept	0.00	Status
Predicted Value	7.05	<2
Linearity (%)	-0.21	PASS
	CO	
Zero	0.00	0.00
High Level	396.00	401.00
Slope	0.99	
Intercept	0.00	Status
Predicted Value	204.55	<2
Linearity (%)	-0.11	PASS
	NOX	
Zero	0.00	0.00
High Level	23.80	24.13
Slope	0.99	
Intercept	0.00	Status
Predicted Value	11.56	<2
Linearity (%)	-0.42	PASS

SYSTEM RESPONSE TIME	#1	#2
Upscale		
NOx	27	28
CO	57	55
O2	27	28
CO2	23	24
Downscale		
NOx	28	27
CO	53	54
O2	26	27
CO2	19	20

NO2 CONVERTER EFFICIENCY	ppm	%	status
Cylinder(Co)	19.50		
NO Mode(C1)	0.25		
NOx Mode(C2)	18.45		
D1	19.25		
D2	18.20		
D3	1.05		
CE		94.55	
CE > 90 %			PASS

POST TEST CALIBRATION ERROR				
LEAK CHECK	Good			
	O2	CO2	CO	NOx
ZERO				
Instrument	0.00	0.00	0.00	0.00
Cylinder	0.00	0.00	0.00	0.00
Difference (%)	0.00	0.00	0.00	0.00
LOW LEVEL				
Instrument				
Cylinder				
Difference (%)				
MID LEVEL				
Instrument	12.05	7.02	200.00	11.30
Cylinder	12.06	7.01	202.00	11.40
Difference (%)	-0.04	0.07	-0.40	-0.40
HIGH LEVEL				
Instrument	20.00	12.12	393.00	23.75
Cylinder	20.07	12.00	396.00	23.80
Difference (%)	-0.28	0.80	-0.60	-0.20

POST TEST LINEARITY	Cylinder	Instrument
	O2	
Zero	0.00	0.00
High Level	20.07	20.00
Slope	1.00	
Intercept	0.00	Status
Predicted Value	12.02	<2
Linearity (%)	0.13	PASS
	CO2	
Zero	0.00	0.00
High Level	12.00	12.12
Slope	0.99	
Intercept	0.00	Status
Predicted Value	7.08	<2
Linearity (%)	-0.40	PASS
	CO	
Zero	0.00	0.00
High Level	396.00	393.00
Slope	1.01	
Intercept	0.00	Status
Predicted Value	200.47	<2
Linearity (%)	-0.09	PASS
	NOX	
Zero	0.00	0.00
High Level	23.80	23.75
Slope	1.00	
Intercept	0.00	Status
Predicted Value	11.38	<2
Linearity (%)	-0.30	PASS

Table 5-2
Trace Organic Species
Destruction Efficiency Results
Simi Valley Landfill
Flare #2 (John Zink)
October 12, 2005
Run 1

		INLET Flow rate	2055	dscfm		OUTLET Flow rate	18364	dscfm
Species	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)		Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Dest. Eff. (%)
Hydrogen Sulfide	35400	1.44E+00	3.92E-01		< 50	< 2.04E-03	< 4.95E-03	> 98.74
Benzene	1940	1.81E-01	4.92E-02		1.06	9.88E-05	2.40E-04	99.51
Benzychloride	< 40	< 6.07E-03	< 1.65E-03		< 0.8	< 1.21E-04	< 2.95E-04	NA
Chlorobenzene	110	1.49E-02	4.04E-03		< 0.3	< 4.05E-05	< 9.84E-05	> 97.56
Dichlorobenzenes	816	1.43E-01	3.90E-02		< 1.1	< 1.93E-04	< 4.69E-04	> 98.80
1,1-dichloroethane	393	4.65E-02	1.26E-02		< 0.3	< 3.55E-05	< 8.62E-05	> 99.32
1,2-dichloroethane	179	2.12E-02	5.76E-03		< 0.3	< 3.55E-05	< 8.62E-05	> 98.50
1,1-dichloroethylene	74.8	8.67E-03	2.36E-03		< 0.3	< 3.48E-05	< 8.45E-05	> 96.42
Dichloromethane	1550	1.57E-01	4.28E-02		4.24	4.31E-04	1.05E-03	97.56
1,2-Dibromoethane	< 30	< 6.74E-03	< 1.83E-03		< 0.3	< 6.74E-05	< 1.64E-04	NA
Perchloroethene	1780	5.04E-01	1.37E-01		< 0.2	< 5.66E-05	< 1.38E-04	> 99.90
Carbon tetrachloride	< 30	< 5.52E-03	< 1.50E-03		< 0.2	< 3.68E-05	< 8.94E-05	NA
Toluene	37800	4.16E+00	1.13E+00		1.46	1.61E-04	3.90E-04	99.97
1,1,1-trichloroethane	35.7	5.67E-03	1.54E-03		< 0.2	< 3.18E-05	< 7.72E-05	> 94.99
Trichloroethene	761	1.19E-01	3.24E-02		< 0.2	< 3.13E-05	< 7.61E-05	> 99.77
Chloroform	< 20	< 2.84E-03	< 7.73E-04		< 0.2	< 2.84E-05	< 6.91E-05	NA
Vinyl Chloride	494	3.69E-02	1.00E-02		< 0.3	< 2.24E-05	< 5.44E-05	> 99.46
m+p-xylenes	15800	2.00E+00	5.44E-01		1.06	1.34E-04	3.26E-04	99.94
o-xylene	5280	6.69E-01	1.82E-01		0.43	5.45E-05	1.32E-04	99.93
TNMHC	6110000	1.17E+02	3.18E+01		1650	3.16E-02	7.66E-02	99.76
Acrylonitrile	< 200	< 1.27E-02	< 3.45E-03		< 2	< 1.27E-04	< 3.08E-04	NA
1,3-butadiene	NM	NM	NM		< 1.0	< 6.94E-05	< 1.69E-04	NA
1,1,2,2-Tetrachloroethane	< 30	< 6.02E-03	< 1.64E-03		< 0.3	< 6.02E-05	< 1.46E-04	NA

Note: All values preceded by "<" are below the detection limit. The reported values are the detection limit.
NA--Not Applicale: Destruction efficiency can not be calculated since both inlet and outlet values are below the detection limit.

Table 5-3
Trace Organic Species
Destruction Efficiency Results
Simi Valley Landfill
Flare #2 (John Zink)
October 12, 2005
Run 2

		INLET Flow rate	2055	dscfm		OUTLET Flow rate	17674	dscfm	
Species	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)		Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)		Dest. Eff. (%)
Hydrogen Sulfide	39300	1.60E+00	4.35E-01		< 50	< 2.04E-03	< 4.76E-03		> 98.91
Benzene	2010	1.87E-01	5.09E-02		0.92	8.58E-05	2.00E-04		99.61
Benzychloride	< 40	< 6.07E-03	< 1.65E-03		< 0.8	< 1.21E-04	< 2.84E-04		NA
Chlorobenzene	114	1.54E-02	4.19E-03		< 0.3	< 4.05E-05	< 9.47E-05		> 97.74
Dichlorobenzenes	898	1.58E-01	4.29E-02		< 1.1	< 1.93E-04	< 4.52E-04		> 98.95
1,1-dichloroethane	408	4.83E-02	1.31E-02		< 0.3	< 3.55E-05	< 8.30E-05		> 99.37
1,2-dichloroethane	184	2.18E-02	5.92E-03		< 0.3	< 3.55E-05	< 8.30E-05		> 98.60
1,1-dichloroethylene	76.6	8.88E-03	2.41E-03		< 0.3	< 3.48E-05	< 8.13E-05		> 96.63
Dichloromethane	1600	1.63E-01	4.42E-02		5.11	5.19E-04	1.21E-03		97.25
1,2-Dibromoethane	< 30	< 6.74E-03	< 1.83E-03		< 0.3	< 6.74E-05	< 1.57E-04		NA
Perchloroethene	1860	5.27E-01	1.43E-01		< 0.2	< 5.66E-05	< 1.32E-04		> 99.91
Carbon tetrachloride	< 30	< 5.52E-03	< 1.50E-03		< 0.2	< 3.68E-05	< 8.61E-05		NA
Toluene	38800	4.27E+00	1.16E+00		0.87	9.57E-05	2.24E-04		99.98
1,1,1-trichloroethane	36.7	5.83E-03	1.59E-03		< 0.2	< 3.18E-05	< 7.43E-05		> 95.31
Trichloroethene	801	1.25E-01	3.41E-02		< 0.2	< 3.13E-05	< 7.32E-05		> 99.79
Chloroform	< 20	< 2.84E-03	< 7.73E-04		< 0.2	< 2.84E-05	< 6.65E-05		NA
Vinyl Chloride	498	3.72E-02	1.01E-02		< 0.3	< 2.24E-05	< 5.24E-05		> 99.48
m+p-xylenes	16600	2.10E+00	5.72E-01		0.52	6.59E-05	1.54E-04		99.97
o-xylene	5610	7.11E-01	1.93E-01		< 0.2	< 2.53E-05	< 5.92E-05		> 99.97
TNMHC	5780000	1.11E+02	3.00E+01		1380	2.64E-02	6.17E-02		99.79
Acrylonitrile	< 200	< 1.27E-02	< 3.45E-03		< 2	< 1.27E-04	< 2.97E-04		NA
1,3-butadiene	NM	NM	NM		< 1.0	< 6.94E-05	< 1.62E-04		NA
1,1,2,2-Tetrachloroethane	< 30	< 6.02E-03	< 1.64E-03		< 0.3	< 6.02E-05	< 1.41E-04		NA

Note: All values preceded by "<" are below the detection limit. The reported values are the detection limit.
NA--Not Applicale: Destruction efficiency can not be calculated since both inlet and outlet values are below the detection limit.

Table 5-4
Trace Organic Species
Destruction Efficiency Results
Simi Valley Landfill
Flare #2 (John Zink)
October 13, 2005
Run 3

		INLET Flow rate	2072	dscfm		OUTLET Flow rate	17474	dscfm	
Species	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)		Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)		Dest. Eff. (%)
Hydrogen Sulfide	41100	1.67E+00	4.59E-01		< 50	< 2.04E-03	< 4.71E-03		> 98.97
Benzene	1940	1.81E-01	4.96E-02		1.45	1.35E-04	3.12E-04		99.37
Benzychloride	< 40	< 6.07E-03	< 1.66E-03		< 0.8	< 1.21E-04	< 2.81E-04		NA
Chlorobenzene	116	1.57E-02	4.29E-03		< 0.3	< 4.05E-05	< 9.36E-05		> 97.82
Dichlorobenzenes	897	1.58E-01	4.32E-02		< 1.1	< 1.93E-04	< 4.47E-04		> 98.97
1,1-dichloroethane	401	4.74E-02	1.30E-02		< 0.3	< 3.55E-05	< 8.20E-05		> 99.37
1,2-dichloroethane	177	2.09E-02	5.74E-03		< 0.3	< 3.55E-05	< 8.20E-05		> 98.57
1,1-dichloroethylene	71.2	8.25E-03	2.26E-03		< 0.3	< 3.48E-05	< 8.04E-05		> 96.45
Dichloromethane	1660	1.69E-01	4.62E-02		3.83	3.89E-04	8.99E-04		98.05
1,2-Dibromoethane	< 30	< 6.74E-03	< 1.85E-03		< 0.3	< 6.74E-05	< 1.56E-04		NA
Perchloroethene	1810	5.13E-01	1.41E-01		< 0.2	< 5.66E-05	< 1.31E-04		> 99.91
Carbon tetrachloride	< 30	< 5.52E-03	< 1.51E-03		< 0.2	< 3.68E-05	< 8.51E-05		NA
Toluene	38900	4.28E+00	1.17E+00		1.69	1.86E-04	4.30E-04		99.96
1,1,1-trichloroethane	34.3	5.45E-03	1.49E-03		< 0.2	< 3.18E-05	< 7.35E-05		> 95.08
Trichloroethene	775	1.21E-01	3.33E-02		< 0.2	< 3.13E-05	< 7.24E-05		> 99.78
Chloroform	< 20	< 2.84E-03	< 7.80E-04		< 0.2	< 2.84E-05	< 6.57E-05		NA
Vinyl Chloride	473	3.53E-02	9.69E-03		< 0.3	< 2.24E-05	< 5.18E-05		> 99.47
m+p-xylenes	16400	2.08E+00	5.70E-01		1.12	1.42E-04	3.28E-04		99.94
o-xylene	5450	6.90E-01	1.89E-01		0.42	5.32E-05	1.23E-04		99.94
TNMHC	5720000	1.09E+02	3.00E+01		2000	3.82E-02	8.84E-02		99.71
Acrylonitrile	< 200	< 1.27E-02	< 3.48E-03		< 2	< 1.27E-04	< 2.93E-04		NA
1,3-butadiene	NM	NM	NM		< 1.0	< 6.94E-05	< 1.60E-04		NA
1,1,2,2-Tetrachloroethane	< 30	< 6.02E-03	< 1.65E-03		< 0.3	< 6.02E-05	< 1.39E-04		NA

Note: All values preceded by "<" are below the detection limit. The reported values are the detection limit.
NA--Not Applicale: Destruction efficiency can not be calculated since both inlet and outlet values are below the detection limit.

Facility: Simi Valley Landfill
Source: Flare #2 (John Zink)
Job No.: W07-043
Test Date: 10/19-20/05

CARB Method 421 HCl Emissions

		RUN	RUN	RUN
RUN NUMBER	******	1	2	3
DATE OF RUN	******	10/19/05	10/19/05	10/20/05
CLOCK TIME: INITIAL	******	840	1245	731
CLOCK TIME: FINAL	******	940	1345	831
AVG. STACK TEMPERATURE	DEGREES F	NA	NA	NA
AVG. SQUARE DELTA P	INCHES H20	NA	NA	NA
BAROMETRIC PRESSURE	IN. HG.	29.22	29.22	29.13
SAMPLING TIME	MIN.	60	60	60
SAMPLE VOLUME	CUBIC FEET	58.694	59.770	59.690
AVG. METER TEMP.	DEGREES F	68	83	63
AVG. DELTA H	IN. H20	3.00	3.00	3.00
DGM CALIB. FACTOR [Y]	******	0.9903	0.9903	0.9903
WATER COLLECTED	MILLITERS	115	109	103
CO 2	PERCENT	7.1	6.6	6.1
O 2	PERCENT	13.5	13.9	15.0
CO	PERCENT	0.0	0.0	0.0
N 2	PERCENT	79.4	79.5	78.9
STACK AREA	SQUARE INCHES	12868.0	12868.0	12868.0
STATIC PRESSURE	INCHES WG.	NA	NA	NA
PITOT COEFFICIENT	******	0.84	0.84	0.84
SAMPLE VOLUME DRY	DSCF	57.19	56.65	58.51
WATER AT STD.	SCF	5.4	5.1	4.9
MOISTURE	PERCENT	8.7	8.3	7.7
MOLE FRACTION DRY GAS	******	0.91	0.92	0.92
MOLECULAR WT.DRY	LB/LB MOLE	29.68	29.61	29.58
EXCESS AIR	PERCENT	180.93	196.11	257.31
MOLECULAR WT. WET	LB/LB MOLE	28.66	28.65	28.69
STACK GAS PRESSURE	INCHES HG.	29.22	29.22	29.13
STACK VELOCITY	AFPM	NA	NA	NA
VOLUMETRIC FLOWRATE, DRY S	DSCFM	16925	16925	16996
VOLUMETRIC FLOWRATE, ACTUA	ACFM	NA	NA	NA

STD. TEMP: 68

CALCULATIONS FOR GRAIN LOADING AND EMISSION RATES

Total HCl	mg	6.03	5.83	6.36
HCl Concentration	mg/dscf	0.1054	0.1029	0.1087
HCl Emissions Rate	lb/hr	0.24	0.23	0.24
Total HF	mg	2.98	2.76	3.06
HF Concentration	mg/dscf	0.05210	0.04872	0.05230
HF Emissions Rate	lb/hr	0.1167	0.1091	0.1176

Facility: Simi Valley Landfill
Source: Flare #2 (John Zink)
Job No.: W07-043
Test Date: 10/19-21/05

CARB Method 425 Chromium Emissions

		STD TEMP:	68	
		RUN	RUN	RUN
RUN NUMBER	******	1	2	3
DATE OF RUN	******	10/19/05	10/20/05	10/21/05
CLOCK TIME: INITIAL	******	1215	1100	700
CLOCK TIME: FINAL	******	1635	1515	1125
AVG. STACK TEMPERATURE	Degrees F	1568	1548	1607
AVG. SQUARE DELTA P	Inches H20	0.1225	0.1225	0.1225
NOZZLE DIAMETER	Inches	1.054	1.054	1.054
BAROMETRIC PRESSURE	In. HG.	29.22	29.13	29.09
SAMPLING TIME	Minutes	240	240	240
SAMPLE VOLUME	Cubic Feet	283.257	282.891	279.818
AVG. METER TEMP.	Degrees F	85	84	70
AVG. DELTA H	In. H20	3.80	3.80	4.20
DGM CALIB. FACTOR [Y]	******	0.9856	0.9856	0.9856
WATER COLLECTED	Milliliters	456	476	536
CO 2	Percent	7.3	7.1	6.3
O 2	Percent	13.4	13.4	14.7
CO	Percent	0.0	0.0	0.0
N 2	Percent	79.3	79.5	79.0
STACK AREA	Square Inches	12868.0	12868.0	12868.0
STATIC PRESSURE	Inches WG.	-0.005	-0.005	-0.005
PITOT COEFFICIENT	******	0.84	0.84	0.84
SAMPLE VOLUME DRY	DSCF	266.47	266.10	270.01
WATER AT STD.	SCF	21.5	22.4	25.3
MOISTURE	Percent	7.5	7.8	8.6
MOLE FRACTION DRY GAS	******	0.93	0.92	0.91
MOLECULAR WT.DRY	lb/lb Mole	29.70	29.67	29.60
EXCESS AIR	Percent	178	177	239
MOLECULAR WT. WET	lb/lb Mole	28.83	28.76	28.60
STACK GAS PRESSURE	Inches HG.	29.22	29.13	29.09
STACK VELOCITY	AFPM	818	816	831
VOLUMETRIC FLOWRATE, DRY STI	DSCFM	17204	17223	16865
VOLUMETRIC FLOWRATE, ACTUAL	ACFM	73104	72943	74275
ISOKINETIC RATIO	Percent	95	95	98
CR+6 PROBE	mg			
CR+6 IMPINGER	mg			
CR+6 TOTAL	mg	0.00000	0.00000	0.00000
CR+6 CONCENTRATION	mg/dscf	0.00000	0.00000	0.00000
CR+6 EMISSION RATE	mg/hr	0.00000	0.00000	0.00000
TOTAL CHROMIUM	mg	1.6	1.4	1.3
CROMIUM CONCENTRATION	mg/dscf	0.00600	0.00526	0.00481
CROMIUM EMISSION RATE	mg/hr	6198	5437	4872

Facility: Simi Valley Landfill
Source: Flare #2 (John Zink)
Job No.: W07-043
Test Date: 11/21/05-11/22/05

CARB Method 425 Chromium Emissions

		STD TEMP:	68		
			RUN	RUN	RUN
RUN NUMBER	******		1	2	3
DATE OF RUN	******		11/21/05	11/21/05	11/22/05
CLOCK TIME: INITIAL	******		825	1325	715
CLOCK TIME: FINAL	******		1253	1550	1147
AVG. STACK TEMPERATURE	Degrees F		1685	1713	1643
AVG. SQUARE DELTA P	Inches H20		0.1095	0.1095	0.1095
NOZZLE DIAMETER	Inches		0.994	0.994	0.994
BAROMETRIC PRESSURE	In. HG.		29.85	29.85	29.79
SAMPLING TIME	Minutes		240	240	240
SAMPLE VOLUME	Cubic Feet		220.502	216.200	215.125
AVG. METER TEMP.	Degrees F		101	96	90
AVG. DELTA H	In. H20		2.60	2.50	2.50
DGM CALIB. FACTOR [Y]	******		0.9990	0.9990	0.9856
WATER COLLECTED	Milliliters		397	390	337
CO 2	Percent		6.0	8.9	6.0
O 2	Percent		14.5	11.4	14.8
CO	Percent		0.0	0.0	0.0
N 2	Percent		79.5	79.7	79.2
STACK AREA	Square Inches		12868.0	12868.0	12868.0
STATIC PRESSURE	Inches WG.		-0.003	-0.003	-0.003
PITOT COEFFICIENT	******		0.84	0.84	0.84
SAMPLE VOLUME DRY	DSCF		208.02	205.85	203.76
WATER AT STD.	SCF		18.7	18.4	15.9
MOISTURE	Percent		8.3	8.2	7.2
MOLE FRACTION DRY GAS	******		0.92	0.92	0.93
MOLECULAR WT.DRY	lb/lb Mole		29.54	29.88	29.55
EXCESS AIR	Percent		223	118	242
MOLECULAR WT. WET	lb/lb Mole		28.59	28.91	28.72
STACK GAS PRESSURE	Inches HG.		29.85	29.85	29.79
STACK VELOCITY	AFPM		747	748	739
VOLUMETRIC FLOWRATE, DRY STI	DSCFM		15046	14875	15315
VOLUMETRIC FLOWRATE, ACTUAL	ACFM		66783	66846	66043
ISOKINETIC RATIO	Percent		96	96	92
CR+6 TOTAL	mg	<	0.00033	< 0.00033	0.00032
CR+6 CONCENTRATION	mg/dscf	<	0.000002	< 0.000002	0.000002
CR+6 EMISSION RATE	mg/hr	<	1.43219	< 1.43082	1.44309
TOTAL CHROMIUM	mg		0.0014	0.0011	0.0011
CROMIUM CONCENTRATION	mg/dscf		0.0000067	0.0000053	0.0000054
CROMIUM EMISSION RATE	mg/hr		6.08	4.77	4.96

CARB Method 429 PAH Emissions

STD.TEMP.: 68

		RUN	RUN	RUN
RUN NUMBER	******	1	2	3
DATE OF RUN	******	10/19/05	10/20/05	10/21/05
CLOCK TIME: INITIAL	******	835	730	700
CLOCK TIME: FINAL	******	1150	1045	1110
AVG. STACK TEMPERATURE	Degrees F	1656	1577	1636
AVG. SQUARE DELTA P	Inches H20	0.1225	0.1225	0.1225
NOZZLE DIAMETER	Inches	1.054	1.054	1.054
BAROMETRIC PRESSURE	Inches HG	29.22	29.13	29.09
BAROMETRIC PRESSURE	Minutes	180	180	180
SAMPLE VOLUME	Cubic Feet	212.452	213.722	210.398
AVG. METER TEMP.	Degrees F	76	75	71
AVG. DELTA H	Inches H20	3.80	3.80	3.80
DGM CALIB. FACTOR [Y]	******	0.9856	0.9856	0.9856
WATER COLLECTED	Milliliters	372	357	370
CO 2	Percent	7.1	6.6	6.1
O 2	Percent	13.5	13.9	15.0
CO	Percent	0.0	0.0	0.0
N 2	Percent	79.4	79.5	78.9
STACK AREA	Square Inches	12968.0	12968.0	12968.0
STATIC PRESSURE	Inches WG.	-0.005	-0.005	-0.005
PITOT COEFFICIENT	******	0.84	0.84	0.84
SAMPLE VOLUME DRY	DSCF	203.29	204.53	202.52
WATER AT STD.	SCF	17.5	16.8	17.4
MOISTURE	Percent	7.9	7.6	7.9
MOLE FRACTION DRY GAS	******	0.92	0.92	0.92
MOLECULAR WT.DRY	lb/lb Mole	29.68	29.61	29.58
EXCESS AIR	Percent	181	196	257
MOLECULAR WT. WET	lb/lb Mole	28.75	28.73	28.66
STACK GAS PRESSURE	Inches HG	29.22	29.13	29.09
STACK VELOCITY	AFPM	838	823	837
VOLUMETRIC FLOWRATE, DRY STD	DSCFM	16925	17295	16996
VOLUMETRIC FLOWRATE, ACT.	ACFM	75451	74160	75384
ISOKINETIC RATIO	Percent	99	98	98

CALCULATIONS FOR GRAIN LOADING AND EMISSION RATES

CARB Method 429 PAH Emissions

	RUN	RUN	RUN
RUN NUMBER	1	2	3
DATE OF RUN	10/19/05	10/20/05	10/21/05
CLOCK TIME: INITIAL	835	730	700
CLOCK TIME: FINAL	1150	1045	1110

PAH EMISSION RATES		WEIGHT (ug)		CONC. @ 12 % CO2 (ug/dscm)		EMISSION RATE (lb/hr)		WEIGHT (ug)		CONC. @ 12 % CO2 (ug/dscm)		EMISSION RATE (lb/hr)		WEIGHT (ug)		CONC. @ 12 % CO2 (ug/dscm)		EMISSION RATE (lb/hr)
NAPHTHALENE		0.37200		0.1092		4.10E-06		0.29100		0.0913		3.25E-06		0.49800		0.1708		5.53E-06
2-METHYLNAPHTHALENE		0.09430		0.0277		1.04E-06		0.09800		0.0308		1.10E-06		0.22000		0.0755		2.44E-06
ACENAPHTHYLENE	<	0.02000	<	0.0059	<	2.20E-07	<	0.02000	<	0.0063	<	2.24E-07		0.02950		0.0101		3.27E-07
ACENAPHTHENE	<	0.02000	<	0.0059	<	2.20E-07	<	0.02000	<	0.0063	<	2.24E-07		0.03450		0.0118		3.83E-07
FLUORENE		0.02530		0.0074		2.79E-07		0.02620		0.0082		2.93E-07		0.13400		0.0460		1.49E-06
PHENANTHRENE		0.12000		0.0352		1.32E-06		0.10100		0.0317		1.13E-06		0.69500		0.2384		7.72E-06
ANTHRACENE	<	0.02000	<	0.0059	<	2.20E-07	<	0.02000	<	0.0063	<	2.24E-07		0.04920		0.0169		5.46E-07
FLUORANTHENE		0.06100		0.0179		6.72E-07		0.02650		0.0083		2.96E-07		0.16200		0.0556		1.80E-06
PYRENE		0.05520		0.0162		6.08E-07		0.02400		0.0075		2.68E-07		0.06410		0.0220		7.12E-07
BENZ(A)ANTHRACENE	<	0.02000	<	0.0059	<	2.20E-07	<	0.02000	<	0.0063	<	2.24E-07	<	0.02000	<	0.0069	<	2.22E-07
CHRYSENE		0.02330		0.0068		2.57E-07	<	0.02000	<	0.0063	<	2.24E-07	<	0.02000	<	0.0069	<	2.22E-07
BENZO(B)FLUORANTHENE	<	0.02000	<	0.0059	<	2.20E-07	<	0.02000	<	0.0063	<	2.24E-07		0.02240		0.0077		2.49E-07
BENZO(K)FLUORANTHENE	<	0.02000	<	0.0059	<	2.20E-07	<	0.02000	<	0.0063	<	2.24E-07	<	0.02000	<	0.0069	<	2.22E-07
BENZO(E)PYRENE	<	0.02000	<	0.0059	<	2.20E-07	<	0.02000	<	0.0063	<	2.24E-07	<	0.02000	<	0.0069	<	2.22E-07
BENZO(A)PYRENE	<	0.02000	<	0.0059	<	2.20E-07	<	0.02000	<	0.0063	<	2.24E-07	<	0.02000	<	0.0069	<	2.22E-07
PYRYLENE	<	0.02000	<	0.0059	<	2.20E-07	<	0.02000	<	0.0063	<	2.24E-07	<	0.02000	<	0.0069	<	2.22E-07
BENZO(G,H,I)PERYLENE	<	0.02000	<	0.0059	<	2.20E-07	<	0.02000	<	0.0063	<	2.24E-07	<	0.02000	<	0.0069	<	2.22E-07
DIBENZ(A,H)ANTHRACENE	<	0.02000	<	0.0059	<	2.20E-07	<	0.02000	<	0.0063	<	2.24E-07	<	0.02000	<	0.0069	<	2.22E-07
INDENO[1,2,3-cd]PYRENE	<	0.02000	<	0.0059	<	2.20E-07	<	0.02000	<	0.0063	<	2.24E-07	<	0.02000	<	0.0069	<	2.22E-07
HEXACHLOROBENZENE		0.00045		0.0001		4.96E-09		0.00046		0.0001		5.17E-09		0.00154		0.0005		1.71E-08
Total PAH				**0.2911**		**1.09E-05**				**0.2596**		**9.25E-06**				**0.7169**		**2.32E-05**
Total PAH w/o Napthalene				**0.1819**		**6.82E-06**				**0.1683**		**6.00E-06**				**0.5461**		**1.77E-05**
Total Carcinogenic PAH				**0.0598**		**2.24E-06**				**0.0629**		**2.24E-06**				**0.0700**		**2.26E-06**

CALCULATIONS FOR GRAIN LOADING AND EMISSION RATES

	FIELD BLANK	FIELD BLANK	FIELD BLANK
RUN NUMBER	1	2	3
DATE OF RUN	10/19/05	10/20/05	10/21/05
CLOCK TIME: INITIAL	835	730	700
CLOCK TIME: FINAL	1150	1045	1110

PAH EMISSION RATES		WEIGHT (ug)	CONC. @ 12 % CO2 (ug/dscm)	EMISSION RATE (lb/hr)		WEIGHT (ug)	CONC. @ 12 % CO2 (ug/dscm)	EMISSION RATE (lb/hr)		WEIGHT (ug)	CONC. @ 12 % CO2 (ug/dscm)	EMISSION RATE (lb/hr)
NAPHTHALENE	<	0.390	0.1145	4.30E-06	<	0.390	0.1224	4.36E-06	<	0.390	0.1338	4.33E-06
2-METHYLNAPHTHALENE	<	0.130	0.0382	1.43E-06	<	0.130	0.0408	1.45E-06	<	0.130	0.0446	1.44E-06
ACENAPHTHYLENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
ACENAPHTHENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
FLUORENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
PHENANTHRENE	<	0.050	0.0147	5.51E-07	<	0.050	0.0157	5.59E-07	<	0.050	0.0171	5.55E-07
ANTHRACENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
FLUORANTHENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
PYRENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
BENZ(A)ANTHRACENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
CHRYSENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
BENZO(B)FLUORANTHENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
BENZO(K)FLUORANTHENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
BENZO(E)PYRENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
BENZO(A)PYRENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
PYRYLENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
BENZO(G,H,I)PERYLENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
DIBENZ(A,H)ANTHRACENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
INDENO[1,2,3-cd]PYRENE	<	0.020	0.0059	2.20E-07	<	0.020	0.0063	2.24E-07	<	0.020	0.0069	2.22E-07
Total PAH			**0.2613**	**9.801E-06**			**0.2794**	**9.955E-06**			**0.3053**	**9.880E-06**
Total PAH w/o Napthalene			**0.1468**	**5.51E-06**			**0.1569**	**5.59E-06**			**0.1715**	**5.55E-06**
Total Carcinogenic PAH			**0.0587**	**2.20E-06**			**0.0628**	**2.24E-06**			**0.0686**	**2.22E-06**

Facility: Simi Valley Landfill
Source: Flare #2 (John Zink)
Job No.: W07-043
Test Date: 10/19-21/05

CARB Method 430

ALDEHYDES

		RUN		RUN		RUN	
Run Number	******	1		2		3	
Date of Run	******	10/19/05		10/20/05		10/21/05	
Clock Time: Start	******	830		700		640	
Clock Time: End	******	1630		1500		1440	
Standard Temperature	F	68		68		68	
Standard Pressure	mm Hg	760		760		760	
Sample Flow Rate							
Ambient Pressure	mm Hg	742		740		739	
Ambient Temperature	F	66		69		64	
Sample Rate (Start)	l/min	0.482		0.481		0.481	
Sample Rate (end)	l/min	0.480		0.482		0.482	
Standard Sample Rate	standard l/min	0.471		0.468		0.472	
Run Duration	min	480		480		480	
Standard Sample Volume	standard liters	226.3		224.6		226.4	
Stack Flow Rate							
Volumetric Flow Rate	dscfm	16925		17295		16996	
Volumetric Flow Rate	acfm	75451		74160		75384	
Emission Rate Calculations							
Formaldehyde							
Average Blank Conc.	ug/ml	0.0133	*	0.0133	*	0.0133	*
Sample Conc.	ug/ml	0.0440	*	0.0130	*	0.0280	*
Blank-Corrected Sample Conc.	ug/ml	0.0307	*	-0.0003	*	0.0147	*
Sample Volume	ml	20	*	20	*	20	*
Total Weight	ug/sample	1.33	*	1.33	*	1.33	*
Concentration	ug/l	0.00588	*	0.00592	*	0.00587	*
Concentration	ppm	0.0047	*	0.0047	*	0.0047	*
Emission Rate	mg/hr	169.0441	*	174.0134	*	169.6180	*
Emission Rate	lb/hr	0.0004	*	0.0004	*	0.0004	*
Acetaldehyde							
Average Blank Conc.	ug/ml	0.0097	*	0.0097	*	0.0097	*
Sample Conc.	ug/ml	0.0575	*	0.0275	*	0.0380	*
Blank-Corrected Sample Conc.	ug/ml	0.0478	*	0.0178	*	0.0283	*
Sample Volume	ml	20	*	20	*	20	*
Total Weight	ug/sample	0.97	*	0.97	*	0.97	*
Concentration	ug/dscf	0.00429	*	0.00432	*	0.00428	*
Concentration	ppm	0.0023	*	0.0024	*	0.0023	*
Emission Rate	mg/hr	123.2878	*	126.9121	*	123.7063	*
Emission Rate	lb/hr	0.0003	*	0.0003	*	0.0003	*

* Note : Since the sample concentration is less than five times the average blank concentration, the reported emissions (concentration and emission rate) are based upon five times the average blank mass per CARB Method 430 requirements.

Facility: Simi Valley Landfill
Source: Flare #2 (John Zink)
Job No.: W07-043
Test Date: 10/12-13/05

CARB Method 436 Metals

		STD. TEMP	68		
RUN NUMBER	******		1	2	3
DATE OF RUN	******		10/12/05	10/12/05	10/13/05
CLOCK TIME: INITIAL	******		822	1204	942
CLOCK TIME: FINAL	******		1125	1402	1142
AVG. STACK TEMPERATURE	Degrees F		1614	1636	1691
AVG. SQUARE DELTA P	Inches H20		0.1346	0.1312	0.1323
NOZZLE DIAMETER	Inches		1.010	1.010	1.010
BAROMETRIC PRESSURE	Inches HG		28.60	28.60	28.70
SAMPLING TIME	Minutes		90	90	90
SAMPLE VOLUME	Cubic Feet		103.630	105.435	111.801
AVG. METER TEMP.	Degrees F		79	92	97
AVG. DELTA H	Inches H20		3.76	3.80	4.40
DGM CALIB. FACTOR [Y]	******		0.9856	0.9856	0.9856
WATER COLLECTED	Milliliters		184	202	237
CO 2	Percent		8.10	8.33	8.63
O 2	Percent		11.92	11.64	11.23
CO	Percent		0.00	0.00	0.00
CH4	Percent		0.00	0.00	0.00
N 2	Percent		79.98	80.03	80.14
STACK AREA	Square Inches		12868.0	12868.0	12868.0
STATIC PRESSURE	Inches WG.		-0.005	-0.005	-0.005
PITOT COEFFICIENT	******		0.84	0.84	0.84
SAMPLE VOLUME DRY	DSCF		96.62	95.99	101.34
WATER AT STD.	SCF		8.7	9.5	11.2
MOISTURE	Percent		8.2	9.0	9.9
MOLE FRACTION DRY GAS	******		0.92	0.91	0.90
MOLECULAR WT.DRY	lb/lb Mole		29.77	29.80	29.83
MOLECULAR WT. WET	lb/lb Mole		28.80	28.73	28.66
STACK GAS PRESSURE	Inches HG		28.60	28.60	28.70
STACK VELOCITY	AFPM		920.3	903	922
VOLUMETRIC FLOWRATE, DRY STD.	DSCFM		18364	17674	17474
VOLUMETRIC FLOWRATE, ACTUAL	ACFM		82243	80692	82388
ISOKINETIC RATIO	Percent		94	97	104

Facility: Simi Valley Landfill
Source: Flare #2 (John Zink)
Job No.: W07-043
Test Date: 10/12-13/05

CARB Method 436 Metals

CALCULATIONS FOR EMISSION RATES

		RUN	RUN	RUN
RUN NUMBER	******	1	2	3
DATE OF RUN	******	10/12/05	10/12/05	10/13/05
CLOCK TIME: INITIAL	******	822	1204	942
CLOCK TIME: FINAL	******	1125	1402	1142

METALS EMISSION RATES		WEIGHT (ug)	CONC. (mg/dscf)	EMISSION RATE (lb/hr)		WEIGHT (ug)	CONC. (mg/dscf)	EMISSION RATE (lb/hr)	WEIGHT (ug)	CONC. (mg/dscf)	EMISSION RATE (lb/hr)
ARSENIC		0.77	7.97E-06	1.94E-05		1.0	1.04E-05	2.44E-05	1.1	1.09E-05	2.51E-05
CADMIUM		0.63	6.52E-06	1.58E-05		0.57	5.94E-06	1.39E-05	0.51	5.03E-06	1.16E-05
COPPER		32.0	3.31E-04	8.05E-04		2.2	2.29E-05	5.36E-05	1.8	1.78E-05	4.11E-05
MANGANESE		1.3	1.35E-05	3.27E-05		3.0	3.13E-05	7.31E-05	6.7	6.61E-05	1.53E-04
MERCURY		1.3	1.35E-05	3.27E-05		1.2	1.25E-05	2.92E-05	0.86	8.49E-06	1.96E-05
NICKEL	<	1.1	1.14E-05	2.77E-05	<	1.1	1.15E-05	2.68E-05	3.1	3.06E-05	7.07E-05
ZINC		5.5	5.69E-05	1.38E-04		13.0	1.35E-04	3.17E-04	11	1.09E-04	2.51E-04
TOTAL				1.07E-03				5.37E-04			5.72E-04

APPENDIX C - Laboratory Results

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Speciated Hydrocarbons Analysis in Tedlar Bag Samples

Report Date: October 24, 2005
Client: Horizon Air Measurement Sevices, Inc.
Site: Simi Valley LF
Project No.: W07-043

Date Received: October 19, 2005
Date Analyzed: October 19, 2005

ANALYSIS DESCRIPTION

1,3-Butadiene analysis was performed by flame ionization detection/gas chromatography (FID/GC), CARB method 422.

AtmAA Lab No.:	02925-1	(repeat)	02925-2	02925-3
Sample ID:	W07043-422 F2-R1-TB1	W07043-422 F2-R1-TB1	W07043-422 F2-R2-TB2	W07043-422 F2-R3-TB3
Components	(Concentration in ppbv)			
1,3-Butadiene	<1.0	<1.0	<1.0	<1.0

Michael L. Porter
Laboratory Director

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CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Simi Valley L.F.	Simi Valley, CA
Project No.	**Field Logbook No.**
WD7-043	
Sampler: (*Signature*)	**Chain of Custody Tape No.**

ANALYSES: 1,3 Butadiene

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	1,3 Butadiene	REMARKS
0703 422-F2 R1 TB1	10/19/05		02905-1	5 L bag	X	Flare 2 R1
0704 B 422 F2 R2 TB2	10/19/05		-2		X	R2
0705 B 422 F2 R3 TB3	10/19/05		-3		X	R3

Relinquished by: (*Signature*)	**Date**	**Time**	**Received by: (*Signature*)**	**Date**	**Time**
	10/19/05	10:15		10/19/05	1618
Relinquished by: (*Signature*)	**Date**	**Time**	**Received by: (*Signature*)**	**Date**	**Time**
Relinquished by: (*Signature*)	**Date**	**Time**	**Received for Laboratory: (*Signature*)**	**Date**	**Time**
Sample Disposal Method:	**Disposed of by: (*Signature*)**			**Date**	**Time**

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Atmaa

Nº 8465

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Methane and Total Gaseous Non-Methane Organics Analysis in Tank and Canister Samples

Report Date: October 27, 2005
Client: Horizon Air Measurement Services
Site: WM - Simi Valley
Client Project No.: W07-043

Date Received: October 13, 2005
Date Analyzed: October 14 - 20, 2005

ANALYSIS DESCRIPTION

Percent level methane was measured by thermal conductivity detection/gas chromatography (TCD/GC). Low level methane and TGNMO were measured by Method 25 analysis, (FID/TCA).

AtmAA Lab No.:	02865-1	02865-2	02865-3	02865-4	02865-5	02865-6
Sample ID:	SUMMA 18	SUMMA 14	SUMMA 21	Tank H	Tank B	Tank N
	(Concentration, ppmv)					
Methane	<1	<1	<1	464000	478000	473000
Ethane	<1	<1	<1	18.9	17.9	11.6
TGNMO	1.65	1.38	2.00	6110	5780	5720

TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppmv methane.
Ethane is reported as ppmv methane.

Michael L. Porter
Laboratory Director

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QUALITY ASSURANCE SUMMARY

(Repeat Analyses)

Site: WM - Simi Valley
Date Received: October 13, 2005
Date Analyzed: October 14 - 20, 2005

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration, ppmv)			
Methane	S4	<1	<1	---	---
	S11	<1	<1	---	---
	S3	<1	<1	---	---
	Tank H	461000	467000	464000	0.65
	Tank N	472000	474000	473000	0.21
Ethane	S18	<1	<1	---	---
	S14	<1	<1	---	---
	S21	<1	<1	---	---
	Tank H	19.4	18.3	18.9	2.9
	Tank B	19.6	16.2	17.9	9.5
	Tank N	10.3	12.9	11.6	11
TGNMO	S18	1.54	1.76	1.65	6.7
	S14	1.41	1.35	1.38	2.2
	S21	2.10	1.89	2.00	5.3
	Tank H	6160	6060	6110	0.82
	Tank B	5760	5790	5780	0.26
	Tank N	5750	5690	5720	0.52

Six tank and canister samples, laboratory numbers 02865-(1-6), were analyzed for methane and TGNMO. Agreement between repeat analyses is a measure of precision and is shown in the column "% Difference from Mean". The average % Difference from Mean for 11 repeat measurements from six samples is 3.6%.

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Oxygen and Carbon Dioxide Analysis in Tank Samples

Report Date: October 27, 2005
Client: Horizon Air Measurement Services
Site: WM - Simi Valley
Client Project No.: W07-043

Date Received: October 13, 2005
Date Analyzed: October 14, 2005

ANALYSIS DESCRIPTION

Oxygen and carbon dioxide were measured by thermal conductivity detection/gas chromatography (TCD/GC).

AtmAA Lab No.:	02865-4	02865-5	02865-6			
Sample ID:	Tank H	Tank B	Tank N			
	(Concentration, %v)					
Oxygen	0.97	0.57	0.65			
Carbon Dioxide	37.6	38.3	38.2			

Michael L. Porter
Laboratory Director

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QUALITY ASSURANCE SUMMARY

(Repeat Analyses)

Site: WM - Simi Valley
Date Received: October 13, 2005
Date Analyzed: October 14, 2005

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration, %v)			
Oxygen	Tank H	0.97	0.97	0.97	0.0
	Tank N	0.63	0.66	0.65	2.3
Carbon Dioxide	Tank H	37.4	37.8	37.6	0.53
	Tank N	38.2	38.2	38.2	0.0

Three tank samples, laboratory numbers 02865-(4-6), were analyzed for oxygen and carbon dioxide. Agreement between repeat analyses is a measure of precision and is shown in the column "% Difference from Mean". The average % Difference from Mean for 4 repeat measurements from three samples is 0.71%.

Calculated values for Specific Volume, BTU and F (factor)

Report Date: October 27, 2005
Client: Hotrizon
Project Location: WM / Simi Valley
Date Received: October 13, 2005
Date Analyzed: October 14 - 20, 2005
AtmAA Lab No.: 02865-4, Tank H

Specific volume, BTU, and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S,	Wt.%
Methane	46.40	26.38	Carbon	36.08
Carbon dioxide	37.60	58.78	Hydrogen	6.64
Nitrogen	13.49	13.42	Oxygen	43.81
Oxygen	0.93	1.06	Nitrogen	13.42
Argon	0.041	0.059	Argon	0.06
$(CH_2)_n$	0.611	0.304	Sulfur	0.00

Specific Volume	13.223
BTU/ft^3	474
BTU/ lb.	6262
F (factor)	9755

dry gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *	
Methane	23.35	(ft^3/lb)
Carbon dioxide	8.59	
Nitrogen	13.54	
Oxygen	11.87	
Argon	9.52	
(CH2)n	21	

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

Calculated values for Specific Volume, BTU and F (factor)

Report Date: October 27, 2005
Client: Hotrizon
Project Location: WM / Simi Valley
Date Received: October 13, 2005
Date Analyzed: October 14 - 20, 2005
AtmAA Lab No.: 02865-5, Tank B

Specific volume, BTU, and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S,	Wt.%
Methane	47.70	27.18	Carbon	37.00
Carbon dioxide	38.30	60.02	Hydrogen	6.84
Nitrogen	11.89	11.86	Oxygen	44.27
Oxygen	0.55	0.62	Nitrogen	11.86
Argon	0.024	0.034	Argon	0.03
$(CH_2)_n$	0.578	0.288	Sulfur	0.00

Specific Volume	13.248
BTU/ft^3	486
BTU/ lb.	6444
F (factor)	9744

dry gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *	
Methane	23.35	(ft^3/lb)
Carbon dioxide	8.59	
Nitrogen	13.54	
Oxygen	11.87	
Argon	9.52	
(CH2)n	21	

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

Calculated values for Specific Volume, BTU and F (factor)

Report Date: October 27, 2005
Client: Hotrizon
Project Location: WM / Simi Valley
Date Received: October 13, 2005
Date Analyzed: October 14 - 20, 2005
AtmAA Lab No.: 02865-6, Tank N

Specific volume, BTU, and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S,	Wt.%
Methane	47.30	26.90	Carbon	36.71
Carbon dioxide	38.20	59.73	Hydrogen	6.76
Nitrogen	12.40	12.34	Oxygen	44.15
Oxygen	0.62	0.71	Nitrogen	12.34
Argon	0.028	0.039	Argon	0.04
$(CH_2)_n$	0.572	0.285	Sulfur	0.00

Specific Volume	13.232
BTU/ft^3	482
BTU/ lb.	6382
F (factor)	9746

dry gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *	
Methane	23.35	(ft^3/lb)
Carbon dioxide	8.59	
Nitrogen	13.54	
Oxygen	11.87	
Argon	9.52	
(CH2)n	21	

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250

LABORATORY ANALYSIS REPORT

environmental consultants
laboratory services

Selected Components Analysis in Outlet Tedlar Bag Samples

Report Date: October 19, 2005
Client: Horizon
Project Location: Wast Management / Simi Valley LF
Client Project No.: W07-043
Date Received: October 13, 2005
Date Analyzed: October 13, 2005

AtmAA Lab No.:	02865-7	02865-8	02865-9
Sample I.D.:	W07043	W07043	W07043
	TB-F2-Out-R1	TB-F2-Out-R2	TB-F2-Out-R3
Components	*(Concentration in ppbv)*		
Hydrogen sulfide	<50	<50	<50
Benzene	1.06	0.92	1.45
Benzylchloride	<0.8	<0.8	<0.8
Chlorobenzene	<0.3	<0.3	<0.3
Dichlorobenzenes*	<1.1	<1.1	<1.1
1,1-dichloroethane	<0.3	<0.3	<0.3
1,2-dichloroethane	<0.3	<0.3	<0.3
1,1-dichloroethylene	<0.3	<0.3	<0.3
Dichloromethane	4.24	5.11	3.83
1,2-dibromoethane	<0.3	<0.3	<0.3
Perchloroethylene	<0.2	<0.2	<0.2
Carbon tetrachloride	<0.2	<0.2	<0.2
Toluene	1.46	0.87	1.69
1,1,1-trichloroethane	<0.2	<0.2	<0.2
Trichloroethene	<0.2	<0.2	<0.2
Chloroform	<0.2	<0.2	<0.2
Vinyl chloride	<0.3	<0.3	<0.3
m+p-xylenes	1.06	0.52	1.12
o-xylene	0.43	<0.2	0.42
Acrylonitrile	<2	<2	<2
1,1,2,2-tetrachloroethane	<0.3	<0.3	<0.3

** total amount containing meta, para, and ortho isomers*

Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY

(Repeat Analyses)

Client Project No.: W07-043
Date Received: October 13, 2005
Date Analyzed: October 13, 2005

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in ppbv)			
Hydrogen sulfide	TB-F2-Out-R1	<50	<50	---	---
Benzene	TB-F2-Out-R1	1.04	1.07	1.06	1.4
Benzylchloride	TB-F2-Out-R1	<0.8	<0.8	---	---
Chlorobenzene	TB-F2-Out-R1	<0.3	<0.3	---	---
Dichlorobenzenes	TB-F2-Out-R1	<1.1	<1.1	---	---
1,1-dichloroethane	TB-F2-Out-R1	<0.3	<0.3	---	---
1,2-dichloroethane	TB-F2-Out-R1	<0.3	<0.3	---	---
1,1-dichloroethylene	TB-F2-Out-R1	<0.3	<0.3	---	---
Dichloromethane	TB-F2-Out-R1	4.21	4.27	4.24	0.71
1,2-dibromoethane	TB-F2-Out-R1	<0.3	<0.3	---	---
Perchloroethylene	TB-F2-Out-R1	<0.2	<0.2	---	---
Carbon tetrachloride	TB-F2-Out-R1	<0.2	<0.2	---	---
Toluene	TB-F2-Out-R1	1.45	1.46	1.46	0.34
1,1,1-trichloroethane	TB-F2-Out-R1	<0.2	<0.2	---	---
Trichloroethene	TB-F2-Out-R1	<0.2	<0.2	---	---
Chloroform	TB-F2-Out-R1	<0.2	<0.2	---	---
Vinyl chloride	TB-F2-Out-R1	<0.3	<0.3	---	---
m+p-xylenes	TB-F2-Out-R1	1.09	1.03	1.06	2.8
o-xylene	TB-F2-Out-R1	0.47	0.39	0.43	9.3
Acrylonitrile	TB-F2-Out-R1	<2	<2	---	---
1,1,2,2-tetrachloroethane	TB-F2-Out-R1	<0.3	<0.3	---	---

Three Tedlar bag samples, laboratory numbers 02865-(7-9), were analyzed for selected components. Agreement between repeat analyses is a measure of precision and is shown above in the column "% Difference from Mean". Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 5 repeat measurements from the three Tedlar bag samples is 2.9%.

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250

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LABORATORY ANALYSIS REPORT

Selected Components Analysis in Inlet Gas Tedlar Bag Samples

Report Date: October 19, 2005
Client: Horizon
Project Location: Wast Management / Simi Valley LF
Client Project No.: W07-043
Date Received: October 13, 2005
Date Analyzed: October 13 & 14, 2005

AtmAA Lab No.:	02865-10	02865-11	02865-12	
Sample I.D.:	W07043 F2-IN-R1	W07043 F2-IN-R2	W07043 F2-IN-R3	
Components	*(Concentration in ppmv)*			
Hydrogen sulfide	35.4	39.3	41.1	
	(Concentration in ppbv)			Avg ppbv
Benzene	1940	2010	1940	1963
Benzylchloride	<40	<40	<40	<40 *
Chlorobenzene	110	114	116	113
Dichlorobenzenes*	816	898	897	870
1,1-dichloroethane	393	408	401	400.7
1,2-dichloroethane	179	184	177	180
1,1-dichloroethylene	74.8	76.6	71.2	74.2 *
Dichloromethane	1550	1600	1660	1603
1,2-dibromoethane	<30	<30	<30	<30
Perchloroethylene	1780	1860	1810	1816.7
Carbon tetrachloride	<30	<30	<30	<30
Toluene	37800	38800	38900	38500
1,1,1-trichloroethane	35.7	36.7	34.3	35.6
Trichloroethene	761	801	775	779
Chloroform	<20	<20	<20	<20
Vinyl chloride	494	498	473	488
m+p-xylenes	15800	16600	16400	16266.7
o-xylene	5280	5610	5450	5446.7
Acrylonitrile	<200	<200	<200	<200
1,1,2,2-tetrachloroethane	<30	<30	<30	<30

(* / 1000 = ppmv)

* = used in AP-42 equation

** total amount containing meta, para, and ortho isomers*

Michael L. Potter
Laboratory Director

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23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
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LABORATORY ANALYSIS REPORT

Hydrogen Sulfide and Reduced Sulfur Compounds
Analysis in Inlet Tedlar Bag Sample

Report Date: October 19, 2005
Client: Horizon
Project Location: Wast Management / Simi Valley LF
Client Project No.: W07-043
Date Received: October 13, 2005
Date Analyzed: October 13, 2005

ANALYSIS DESCRIPTION

Hydrogen sulfide was analyzed by gas chromatography with a Hall electrolytic conductivity detector operated in the oxidative sulfur mode. All other components were measured by GC/ Mass Spec.

AtmAA Lab No.:	02865-10	02865-11	02865-12	
Sample I.D.:	W07043 F2-IN-R1	W07043 F2-IN-R2	W07043 F2-IN-R3	
Components	(Concentration in ppmv)			AVG
Hydrogen sulfide	35.4	39.3	41.1	38.6
Carbonyl sulfide	0.32	0.31	0.32	0.32
Methyl mercaptan	3.72	4.04	4.17	3.98
Ethyl mercaptan	<0.1	<0.1	<0.1	<0.1
Dimethyl sulfide	6.35	6.72	6.86	6.64
Carbon disulfide	0.19	0.20	0.20	.19
isopropyl mercaptan	0.56	0.62	0.62	0.6
n-propyl mercaptan	<0.06	<0.06	<0.06	<0.06
Dimethyl disulfide	0.22	0.23	0.19	.21
TRS	47.2	51.9	53.9	51

* = not in AP-42 list

TRS - total reduced sulfur

Michael L. Porter
Laboratory Director

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QUALITY ASSURANCE SUMMARY
(Repeat Analyses)

Client Project No.: W07-043
Date Received: October 13, 2005
Date Analyzed: October 13 & 14, 2005

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in ppbv)			
Benzene	F2-IN-R1	1900	1970	1940	1.8
Benzylchloride	F2-IN-R1	<40	<40	---	---
Chlorobenzene	F2-IN-R1	109	111	110	0.91
Dichlorobenzenes	F2-IN-R1	790	841	816	3.1
1,1-dichloroethane	F2-IN-R1	387	399	393	1.5
1,2-dichloroethane	F2-IN-R1	176	182	179	1.7
1,1-dichloroethylene	F2-IN-R1	74.5	75.2	74.8	0.47
Dichloromethane	F2-IN-R1	1540	1560	1550	0.64
1,2-dibromoethane	F2-IN-R1	<30	<30	---	---
Perchloroethylene	F2-IN-R1	1740	1820	1780	2.2
Carbon tetrachloride	F2-IN-R1	<30	<30	---	---
Toluene	F2-IN-R1	36900	38700	37800	2.4
1,1,1-trichloroethane	F2-IN-R1	35.2	36.2	35.7	1.4
Trichloroethene	F2-IN-R1	744	778	761	2.2
Chloroform	F2-IN-R1	<20	<20	---	---
Vinyl chloride	F2-IN-R1	495	492	494	0.30
m+p-xylenes	F2-IN-R1	15600	16100	15800	1.6
o-xylene	F2-IN-R1	5140	5430	5280	2.7
Acrylonitrile	F2-IN-R1	<200	<200	---	---
1,1,2,2-tetrachloroethane	F2-IN-R1	<30	<30	---	---

QUALITY ASSURANCE SUMMARY
(Repeat Analyses)
(continued)

Sulfur Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in ppmv)			
Hydrogen sulfide	F2-IN-R1	35.9	35.0	35.4	1.3
	F2-IN-R2	39.8	38.8	39.3	1.3
	F2-IN-R3	41.4	40.8	41.1	0.73
Carbonyl sulfide	F2-IN-R1	0.33	0.30	0.32	4.8
Methyl mercaptan	F2-IN-R1	3.68	3.76	3.72	1.1
Ethyl mercaptan	F2-IN-R1	<0.1	<0.1	---	---
Dimethyl sulfide	F2-IN-R1	6.26	6.44	6.35	1.4
Carbon disulfide	F2-IN-R1	0.19	0.19	0.19	0.0
iso-propyl mercaptan	F2-IN-R1	0.56	0.57	0.56	0.88
n-propyl mercaptan	F2-IN-R1	<0.06	<0.06	---	---
Dimethyl disulfide	F2-IN-R1	0.19	0.25	0.22	14

Three Tedlar bag samples, laboratory numbers 02865-(10-12), were analyzed for selected components, hydrogen sulfide, and total reduced sulfur compounds. Agreement between repeat analyses is a measure of precision and is shown above in the column "% Difference from Mean". Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 23 repeat measurements from the three Tedla bag samples is 2.1%.

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Waste Management / Simi Valley LF	Simi Valley, CA
Project No.	**Field Logbook No.**
W07-043	
Sampler: (Signature)	**Chain of Custody Tape No.**

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	ANALYSES: EPA Method 25C (CH4, TGNMO)	ASTM 3588-91 (N.H.V.)	O2/CO2				REMARKS
Summa S18	10/12/05		02865-1	6L Summa	X						Flare #2 Outlet Run1
" S14	↓		2	↓	X						" " Run2
" S21	10/13/05		3		X						" " Run3
Tank H	10/12/05		4	12L Tank	X	X	X				Flare #2 Inlet Run1
" B	↓		5	↓	X	X	X				" " Run2
" N	10/13/05		6		X	X	X				" " Run3

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	10/13/05	1400			
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
				10-13-05	2:00
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Atm AA
Calabasas, CA

№ 8396

000

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Waste Management/Simi Valley LF	Simi Valley, CA
Project No.	**Field Logbook No.**
W07-043	
Sampler: (Signature)	**Chain of Custody Tape No.**
[signature]	

Sample No./ Identification	~~Date~~	Date ~~Time~~	Lab Sample Number	Type of Sample	SCAQMD Rule 1150.1 List	ethylene dibromide	acrylonitrile	1,1,2,2 tetrachloroethane	C1-C3 sulfur compounds	(w/H2S)	REMARKS
W07013-TB-F2-INT-R1		10/12/05	02865-7	5L Tedlar Bag	X	X	X	X			Flare #2 Outlet Run1
W07013-TB-F2-OUT-R2		↓	8	↓	X	X	X	X			" " Run2
W07013-TB-F2-OUT-R3		10/13/05	9		X	X	X	X			" " Run3
W07013-TB-F2-IN-R1		10/12/05	10		X	X	X	X	X		Flare #2 Inlet Run1
W07013-TB-F2-IN-R2		↓	11		X	X	X	X	X		" " Run2
W07013-TB-F2-IN-R3		10/13/05	12	↓	X	X	X	X	X		" " Run3

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[signature]	10/13/05	1400			
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
			[signature]	10/13/05	2100
Sample Disposal Method:			Disposed of by: (Signature)	Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Atm AA
Calabasas, CA

№ 8397

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Atmospheric Analysis & Consulting, Inc.

CLIENT	: Horizon Air Measurement Services, Inc.
PROJECT NAME	: W07-043
AAC PROJECT NO.	: 050528
REPORT DATE	: 10/26/2005

On October 24, 2005, Atmospheric Analysis & Consulting, Inc. received ten (10) DNPH impinger contents for Formaldehyde and Acetaldehyde by Method CARB 430. The samples were assigned unique Laboratory ID numbers as follows:

Client ID	Lab No.
W07043-M430-F2-R1-IMP1	050528-13083
W07043-M430-F2-R1-IMP2	050528-13084
W07043-M430-F2-Spike	050528-13085
W07043-M430-F2-FB1	050528-13086
W07043-M430-F2-FB2	050528-13087
W07043-M430-F2-FB3	050528-13088
W07043-M430-F2-R2-IMP1	050528-13089
W07043-M430-F2-R2-IMP2	050528-13090
W07043-M430-F2-R3-IMP1	050528-13091
W07043-M430-F2-R3-IMP2	050528-13092

CARB 430 – Ten (10) ml of Methylene Chloride: Hexane (30:70) was added to each impinger prior to sampling. Five (5) milliliters of the organic layer was removed from all samples. The organic extracts were then concentrated to dryness under a stream of UHP Nitrogen. When the samples reached dryness the vials were removed from the nitrogen stream and five (5) ml of Carbonyl-free Acetonitrile was added to the vial. A 20ul aliquot of the extract was analyzed by HPLC/UV following CARB Method 430 as specified in the chain of custody. Holding times for preparation and analysis were complied with.

No problems were encountered during receiving, preparation and/ or analysis of these samples. The test results included in this report meet all requirements of the NELAC Standards and/or AAC SOPs# AACI-TO-5/CARB430. Estimated Uncertainty of the test results will be provided upon request.

I certify that this data is technically accurate, complete and in compliance with the terms and conditions of the contract. Release of the data contained in this hardcopy data package and its electronic data deliverable submitted on diskette has been authorized by the Laboratory Director or his designee, as verified by the following signature.

If you have any questions or if you require further explanation of data results, please contact the undersigned.

Sucha S. Parmar, PhD
Technical Director

This report consists of 5 pages.

ACCREDITED IN ACCORDANCE WITH nelac Certificate#E87837

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Atmospheric Analysis & Consulting, Inc.

LABORATORY ANALYSIS REPORT

CLIENT : Horizon Air Measurment Services, Inc.
PROJECT NO.: 050528
UNITS : ug/sample

SAMPLING DATE : 10/19-21/2005
RECEIVING DATE : 10/24/2005
ANALYSIS DATE : 10/25/2005
REPORTING DATE : 10/26/2005

Formaldehyde and Acetaldehyde by Method CARB 430

Analyte		*Formaldehyde*	*Acetaldehyde*
Limit of Detection		*0.002ug/ml*	*0.002ug/ml*
Client ID#	**Lab No.**	**ug/sample**	**ug/sample**
W07043-M430-F2-R1-IMP1	050528-13083	0.58	0.39
W07043-M430-F2-R1-IMP2	050528-13084	0.30	0.76
W07043-M430-F2-Spike	050528-13085	120	0.77
W07043-M430-F2-FB1	050528-13086	0.07	0.07
W07043-M430-F2-FB2	050528-13087	0.19	0.12
W07043-M430-F2-FB3	050528-13088	0.14	0.10
W07043-M430-F2-R2-IMP1	050528-13089	0.23	0.50
W07043-M430-F2-R2-IMP2	050528-13090	0.03	0.05
W07043-M430-F2-R3-IMP1	050528-13091	0.40	0.38
W07043-M430-F2-R3-IMP2	050528-13092	0.16	0.38

Dr. Sucha Parmar
Technical Director

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Atmospheric Analysis & Consulting, Inc.

QUALITY CONTROL/QUALITY ASSURANCE REPORT

CLIENT ID : Horizon Air Measurement Services, Inc.
LAB NO. : 050528
MEDIA : DNPH

ANALYSIS DATE: : 10/25/2005
REPORT DATE: : 10/26/2005

I-Method Blank - ug/ml

Analyte	Sample Analysis
Formaldehyde	ND

II-Duplicate Analysis - 050528-13083 ug/ml

Analyte	Sample Analysis	Duplicate Analysis	Mean	% RPD
Formaldehyde	0.06	0.06	0.06	**0.0**
Acetaldehyde	0.04	0.04	0.04	**0.0**
Acrolein	0.00	0.00	0.00	**0.0**

III-Spiked Sample - 050528-13083 ug/ml

Analyte	Sample Conc.	Spike Added	Spike Res	Dup Spike Res	Spike % Rec *	Spike Dup % Rec *	RPD** %
Formaldehyde	0.03	0.75	0.84	0.82	107	105	**1.9**
Acetaldehyde	0.02	0.75	0.79	0.78	103	101	**2.0**
Acrolein	0.00	0.75	0.82	0.81	109	107	**2.0**

IV-Laboratory Control Spike -ug/ml

Analyte	Spike Added	Spike Res	Dup Spike Res	Spike % Rec *	Spike Dup % Rec *	RPD** %
Formaldehyde	1.5	1.67	1.70	111	113	**1.8**
Acetaldehyde	1.5	1.63	1.66	109	111	**1.9**
Acrolein	1.5	1.71	1.72	114	114	**0.6**

* Must be 70-130%

** Must be < 25%

Dr. Sucha Parmar
President

084

Atmospheric Analysis & Consulting, Inc.

Spike Recovery

CARB 430 DNPH SOLUTION

CLIENT : **Horizon Air Management**

AAC Project No : 050528

Client Project No : W07-043

CARB 430

Sample	*Formaldehyde Conc. (ug/mL)*
DNPH sol. Spike #1	117
W07043-M430-F2-Spike	120

Percent Recovery	102

Sucha Parmar

Technical Director

085

Atmospheric Analysis & Consulting, Inc.

DEMONSTRATION OF ACCEPTABLE PERFORMANCE

CARB 430 DNPH SOLUTION

PREP DATE : 10/18/2005
AAC Project No : 050528
ANALYSIS DATE : 10/18/2005
Client Project No : W07-043

CARB 430

MDL	*0.002ug/ml*		
Analyte	*Formaldehyde*		
DNPH sol	**Theoretical Conc.**	**Practical Conc.**	**% Recovery**
DNPH sol. Spike #1	100	117	117
DNPH sol. Spike #2	100	117	117
Average			**117**
Std. Dev.			**0.0**

Dr. Sucha Parmar
Technical Director

086

1534 Eastman Avenue • Suite A • Ventura, California 93003 (805) 650-1642 • FAX (805) 650-1644

Atmospheric Analysis & Consulting, Inc.

CARB 430 DNPH SOLUTION CERTIFICATION

CLIENT : **Horizon Air Management**
PREP DATE : 10/18/05
AAC Project No : 050528

ANALYSIS DATE : 10/18/05
SHIPPING DATE : 10/18/05
Client Project No : W07-043

CARB 430

MDL	*0.002 ug/ml*	*0.002 ug/ml*	*0.001 ug/ml*
	Formaldehyde	*Acetaldehyde*	*Acrolein*
DNPH sol	**ug/ml**	**ug/ml**	**ug/ml**
DNPH sol. Run #1	ND	0.008	ND
DNPH sol. Run #2	ND	0.008	ND
DNPH sol. Run #3	ND	ND	ND
DNPH sol. Run #4	ND	ND	ND
Average	ND	0.004	ND

I certify that the above DNPH solution lot complies with the requirements as stated in the SOW.

Dr. Sucha Parmar
Technical Director

087

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Simi Valley L.F	Simi Valley L.F.
Project No.	**Field Logbook No.**
W07-043	
Sampler: (Signature)	**Chain of Custody Tape No.**
Ti Williams	

ANALYSES: OPUB m430 Acetaldehyde/formaldehyde; Weight (g); LAB weight

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	REMARKS
7043 M430 F2 R1 IMP1	10/19/05		130863		Flare 2 Run 1 Inlet
7043 M430 F2 R1 IMP 2	10/19/05		130864		Flare 2 Run 2 Inlet 2
7043 M430 F2 SPIKE	10/19/05		130865		Spike
7043 M430 F2 FB1	10/19/05		130866		Blank 1
7043 M430 F2 FB 2	10/19/05		130867		Blank 2
7043 M430 F2 FB 3	10/19/05		130868		Blank 3

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Ti Williams	10/24/05	0800			
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	10/24/05	08:50			
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

AAC

No 3466

CHAIN OF CUSTODY RECORD

04089

Client/Project Name	Project Location
Simi Valley L.F	Simi Valley, CA
Project No.	**Field Logbook No.**
107043	
Sampler: (*Signature*)	**Chain of Custody Tape No.**

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	ANALYSES: CARB 430 Methaldehyde / Formaldehyde	Acetaldehyde (5)	Acrolein (5)				REMARKS
WJ0643-430-F2 R2 IMP1	10/20/05		13089		X	35					Imp #1 / Valve #1
0704 3-430 F2 R2 IMP2	10/20/05		13090		X	32					Imp #2 / Valve #2
											Flow #2
0704 3-430 F2 R3 IMP1	10/21/05		13091		X	36					Imp #1 / Valve #1
0704 3-430 F2 R3 IMP2	10/21/05		13092		X	31					Imp #2 / Valve #2

Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
	10/24/05	08:00			
Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
	10/24/05	08:50		10/25/05	
Relinquished by: (*Signature*)	Date	Time	Received for Laboratory: (*Signature*)	Date	Time
Sample Disposal Method:	Disposed of by: (*Signature*)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

680

ANALYTICAL LABORATORY

AAC

Nº 8471

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

Horizon Air Measurement Services
996 Lawrence Drive
Suite 108
Newbury Park, CA 91320

Date: 11-NOV-05
Lab Job Number: 182803
Project ID: STANDARD
Location: Simi Valley L.F.

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis.

Reviewed by: _____
Project Manager

Reviewed by: _____
Operations Manager

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**182803**
Client:	**Horizon Air Measurement Services**
Location:	**Simi Valley L.F.**
Request Date:	**10/27/05**
Samples Received:	**10/24/05**

This hardcopy data package contains sample and QC results for fifteen water samples, requested for the above referenced project on 10/27/05. The samples were received intact.

Ion Chromatography (EPA 300.0):
No analytical problems were encountered.

Volume Measurement (MEASURE):
No analytical problems were encountered.

Curtis & Tompkins, Ltd.

Volume Measurement

Lab #:	182803	Location:	Simi Valley L.F.
Client:	Horizon Air Measurement Services	Analysis:	MEASURE
Project#:	STANDARD		
Analyte:	Sample Volume	Diln Fac:	1.000
Matrix:	Water	Received:	10/24/05
Units:	mL	Analyzed:	11/01/05

Field ID	Lab ID	Result	RL	Sampled
W07043421-F1-R1-C1	182803-001	210	1.0	10/14/05
W07043421-F1-R1-C2	182803-002	390	1.0	10/14/05
W07043421-F1-R2-C1	182803-003	220	1.0	10/18/05
W07043421-F1-R2-C2	182803-004	470	1.0	10/18/05
W07043421-F1-R3-C1	182803-005	170	1.0	10/18/05
W07043421-F1-R3-C2	182803-006	450	1.0	10/18/05
W07043421-F2-R1-C1	182803-007	110	1.0	10/19/05
W07043421-F2-R1-C2	182803-008	490	1.0	10/19/05
W07043421-F2-R2-C1	182803-009	100	1.0	10/19/05
W07043421-F2-R2-C2	182803-010	400	1.0	10/19/05
W07043421-F2-R3-C1	182803-011	200	1.0	10/20/05
W07043421-F2-R3-C2	182803-012	520	1.0	10/20/05
W07043421 S.B.	182803-013	250	1.0	10/18/05
W07043421-FB-C1	182803-014	110	1.0	10/18/05
W07043421-FB-C2	182803-015	310	1.0	10/18/05

RL= Reporting Limit

Curtis & Tompkins, Ltd.

Fluoride

Lab #:	182803	Location:	Simi Valley L.F.
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 300.0
Analyte:	Fluoride	Diln Fac:	1.000
Matrix:	Water	Received:	10/24/05
Units:	mg/L		

Field ID	Type	Lab ID		Result	RL	Batch#	Sampled	Analyzed
W07043421-F1-R1-C1	SAMPLE	182803-001		0.43	0.10	107343	10/14/05	11/01/05 16:22
W07043421-F1-R1-C2	SAMPLE	182803-002		1.2	0.10	107343	10/14/05	11/01/05 16:39
W07043421-F1-R2-C1	SAMPLE	182803-003		5.1	0.10	107343	10/18/05	11/01/05 16:57
W07043421-F1-R2-C2	SAMPLE	182803-004		6.9	0.10	107343	10/18/05	11/01/05 17:14
W07043421-F1-R3-C1	SAMPLE	182803-005		1.9	0.10	107343	10/18/05	11/01/05 17:32
W07043421-F1-R3-C2	SAMPLE	182803-006		6.5	0.10	107394	10/18/05	11/02/05 16:44
W07043421-F2-R1-C1	SAMPLE	182803-007		4.8	0.10	107343	10/19/05	11/01/05 18:07
W07043421-F2-R1-C2	SAMPLE	182803-008		5.0	0.10	107343	10/19/05	11/01/05 19:35
W07043421-F2-R2-C1	SAMPLE	182803-009		2.8	0.10	107343	10/19/05	11/01/05 19:52
W07043421-F2-R2-C2	SAMPLE	182803-010		6.2	0.10	107394	10/19/05	11/02/05 17:02
W07043421-F2-R3-C1	SAMPLE	182803-011		1.8	0.10	107343	10/20/05	11/01/05 20:27
W07043421-F2-R3-C2	SAMPLE	182803-012		5.2	0.10	107394	10/20/05	11/02/05 19:22
W07043421 S.B.	SAMPLE	182803-013	ND		0.10	107343	10/18/05	11/01/05 16:04
W07043421-FB-C1	SAMPLE	182803-014	ND		0.10	107343	10/18/05	11/01/05 15:47
W07043421-FB-C2	SAMPLE	182803-015	ND		0.10	107343	10/18/05	11/01/05 15:29
	BLANK	QC315431	ND		0.10	107343		11/01/05 11:54
	BLANK	QC315655	ND		0.10	107394		11/02/05 15:52

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Chloride

Lab #:	182803	Location:	Simi Valley L.F.
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 300.0
Analyte:	Chloride	Diln Fac:	1.000
Matrix:	Water	Received:	10/24/05
Units:	mg/L		

Field ID	Type	Lab ID		Result	RL	Batch#	Sampled	Analyzed
W07043421-F1-R1-C1	SAMPLE	182803-001		1.9	0.20	107343	10/14/05	11/01/05 16:22
W07043421-F1-R1-C2	SAMPLE	182803-002		2.5	0.20	107343	10/14/05	11/01/05 16:39
W07043421-F1-R2-C1	SAMPLE	182803-003		8.9	0.20	107343	10/18/05	11/01/05 16:57
W07043421-F1-R2-C2	SAMPLE	182803-004		12	0.20	107343	10/18/05	11/01/05 17:14
W07043421-F1-R3-C1	SAMPLE	182803-005		2.1	0.20	107343	10/18/05	11/01/05 17:32
W07043421-F1-R3-C2	SAMPLE	182803-006		15	0.20	107394	10/18/05	11/02/05 16:44
W07043421-F2-R1-C1	SAMPLE	182803-007		5.8	0.20	107343	10/19/05	11/01/05 18:07
W07043421-F2-R1-C2	SAMPLE	182803-008		11	0.20	107343	10/19/05	11/01/05 19:35
W07043421-F2-R2-C1	SAMPLE	182803-009		6.3	0.20	107343	10/19/05	11/01/05 19:52
W07043421-F2-R2-C2	SAMPLE	182803-010		13	0.20	107394	10/19/05	11/02/05 17:02
W07043421-F2-R3-C1	SAMPLE	182803-011		5.8	0.20	107343	10/20/05	11/01/05 20:27
W07043421-F2-R3-C2	SAMPLE	182803-012		10	0.20	107394	10/20/05	11/02/05 19:22
W07043421 S.B.	SAMPLE	182803-013	ND		0.20	107343	10/18/05	11/01/05 16:04
W07043421-FB-C1	SAMPLE	182803-014	ND		0.20	107343	10/18/05	11/01/05 15:47
W07043421-FB-C2	SAMPLE	182803-015	ND		0.20	107343	10/18/05	11/01/05 15:29
	BLANK	QC315431	ND		0.20	107343		11/01/05 11:54
	BLANK	QC315655	ND		0.20	107394		11/02/05 15:52

ND= Not Detected
RL= Reporting Limit

2.0

Batch QC Report

Fluoride

Lab #:	182803	Location:	Simi Valley L.F.
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 300.0
Analyte:	Fluoride	Units:	mg/L
Matrix:	Water		

Field ID	Type	MSS Lab ID	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Dil'n Fac	Batch#	Sampled	Received	Analyzed
	BS		QC315432		2.000	1.974	99	80-120			1.000	107343			11/01/05 12:11
	BSD		QC315433		2.000	1.798	90	80-120	9	20	1.000	107343			11/01/05 12:29
ZZZZZZZZZZ	MS	182845-008	QC315434	4.757	20.00	22.34	88	80-120			20.00	107343	10/26/05	10/28/05	11/01/05 13:09
ZZZZZZZZZZ	MSD	182845-008	QC315435		20.00	22.00	86	80-120	2	20	20.00	107343	10/26/05	10/28/05	11/01/05 13:26
	BS		QC315656		2.000	1.852	93	80-120			1.000	107394			11/02/05 16:09
	BSD		QC315657		2.000	1.821	91	80-120	2	20	1.000	107394			11/02/05 16:27
W07043421 F2 R3 C2	MS	182803-012	QC315658	5.168	2.000	6.896	86	80-120			2.000	107394	10/20/05	10/24/05	11/02/05 20:50
W07043421-F2-R3-C2	MSD	182803-012	QC315659		2.000	6.976	90	80-120	1	20	2.000	107394	10/20/05	10/24/05	11/02/05 22:00

RPD= Relative Percent Difference

Batch QC Report

Chloride

Lab #:	182803	Location:	Simi Valley L.F.
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 300.0
Analyte:	Chloride	Units:	mg/L
Matrix:	Water		

Field ID	Type	MSS Lab ID	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Diln Fac	Batch#	Sampled	Received	Analyzed
	BS		QC315432		4.000	4.210	105	80 120			1.000	107343			11/01/05 12:11
	BSD		QC315433		4.000	3.758	94	80-120	11	20	1.000	107343			11/01/05 12:29
ZZZZZZZZZZ	MS	182845 008	QC315434	92.25	40.00	130.5	96	80-120			20.00	107343	10/26/05	10/28/05	11/01/05 13:09
ZZZZZZZZZZ	MSD	182845 008	QC315435		40.00	129.6	93	80-120	1	20	20.00	107343	10/26/05	10/28/05	11/01/05 13:26
	BS		QC315656		4.000	4.010	100	80-120			1.000	107394			11/02/05 16:09
	BSD		QC315657		4.000	3.902	98	80-120	3	20	1.000	107394			11/02/05 16:27
W07043421 F2-R3-C2	MS	182803-012	QC315658	9.961	4.000	13.66	93	80-120			2.000	107394	10/20/05	10/24/05	11/02/05 20:50
W07043421 F2-R3-C2	MSD	182803-012	QC315659		4.000	13.89	98	80-120	2	20	2.000	107394	10/20/05	10/24/05	11/02/05 22:00

RPD= Relative Percent Difference

16001-

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Simi Valley L.F.	Simi Valley CA
Project No.	**Field Logbook No.**
W07-043	
Sampler: (Signature)	**Chain of Custody Tape No.**

ANALYSES: M421 CH4 | HCl | HF | 421

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	REMARKS
1 W07043 421-F1-R1 C1	10/14/05			DI RINSE	Flare #1 Run #1
2 W07043 421-F1-R1 C2	10/14/05			DI RINSE	
3 W07043 421 F1-R2 C1	10/18/05			DI Rinse	Flare #1 Run #2
4 W07043 421 F1 R2 C2	10/18/05				
5 W07043 421 F1 R3 C1	10/18/05			DI Rinse	Flare #1 R-3
6 W07043 421 F1 R3 C2	10/18/05				

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	10/22/05	1000		10/22/05	1000
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	10/24/05	1840	Lawanna Crupi	10/25/05	6:45
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

ambient ; intact IL

Nº 8402

097

1628D3

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Simi Valley L.F.	Simi Valley CA
Project No.	**Field Logbook No.**
W07-043	
Sampler: (Signature)	**Chain of Custody Tape No.**
T. Wilson	

ANALYSES: M421 HCl/HF CARB METHOD 421

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	REMARKS
W07043-421-F2 R1 C1	10/19/05				Flare 2 R-1
W07043-421-F2-R1 C2	10/19/05				↓
W07-043-421-F2-R2 C1	10/19/05				Flare 2 R2
W07043 421 F2 R2 C2	10/19/05				↓
W07043-421-F2-R3 C1	10/20/05				Flare 2 R3
W07-043 421-F2-R3 C2	10/20/05				↓

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
T. Wilson	10/22/05	1000		10/22/05	1000
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	10/24/05	1840		10/24/05	6:45 PM
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Ambient Et intech
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Nº 8469

860

182803

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANALYSES
Simi Valley L.F	Simi Valley, CA	

Project No.	Field Logbook No.
W07-043	

Sampler: (Signature)	Chain of Custody Tape No.
[signature]	

	Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	CARB METHOD 421 (M421) HCL/HF AZ						REMARKS
.13 07043	421 S.B.	10/18/05				X						250mL Solution Blank
-14 07043	421-FB-C1	10/18/05				X						Probe/Nozzle Rinse
.15 07043	421 FB C2	10/18/05				X						Train (Rinse)

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[signature]	10/22/05	1000	[signature] NC	10/22/05	1000
Relinquished by: (Signature) [signature] NC	Date 10/24/05	Time 1840	Received by: (Signature) Lavanna Curtis	Date 10/24/05	Time 6:45
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time

Sample Disposal Method:	Disposed of by: (Signature)	Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

ambient; intact; JL

№ 8461

099

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

Horizon Air Measurement Services
996 Lawrence Drive
Suite 108
Newbury Park, CA 91320

Date: 23-NOV-05
Lab Job Number: 182975
Project ID: STANDARD
Location: Simi Valley, L.F.

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis.

Reviewed by: _____
Project Manager

Reviewed by: _____
Operations Manager

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**182975**
Client:	**Horizon Air Measurement Services**
Location:	**Simi Valley, L.F.**
Request Date:	**11/04/05**
Samples Received:	**10/24/05**

This hardcopy data package contains sample and QC results for eight air samples, requested for the above referenced project on 11/04/05. The samples were received cold and intact.

Metals (EPA 6010B and EPA 7470A):

Zinc was detected above the RL in the method blank for batch 107767. No other analytical problems were encountered.

182975

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Simi Valley, L.F.	Simi Valley, CA
Project No.	**Field Logbook No.**
W07-043	
Sampler: (Signature)	**Chain of Custody Tape No.**
Jim Williams	

ANALYSES: Carbonyls, As, Cd, Mn, Zn, Hg, Ni, Cr

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	REMARKS
W07043-436-F1-R1 C1	10/11/05			Front 1/2 Rinse	Flare #1, R-1
W07043-436-F1 R1 C2				Filter	
W07043-436-F1 R1 C3				Impinger 1,2&3	
W07043-436-F1 R1 C4				Impinger #4	
W07043-436-F1 R1 C5				Impingers #5&6	

	Date	Time		Date	Time
Relinquished by: (Signature) Jim Williams	10/22/05	1000	Received by: (Signature)	10/22/05	1000
Relinquished by: (Signature)	10/24/05	1840	Received by: (Signature) Lawanna Lish	10/24/05	0:45
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

ambient; intact JL

Nº 8292

2 of 2

182975

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Simi Valley L.F.	Simi Valley, CA
Project No.	**Field Logbook No.**
W07-043	
Sampler: (Signature)	**Chain of Custody Tape No.**
T. Williams	

ANALYSES: CARB 436 As, Cd, Mn, Zn, Hg, Ni, Cu

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample							REMARKS
W07 043-436-F1-R2 C1	10/11/05			Front ½ rinse	✓						Flare #1, R-2
W07 043-436-F1 R2 C2				Filter	✓						
W07 043-436-F1-R2 C3				Impingers 1, 2 & 3	✓						
W07 043-436-F1 R2 C4				Impinger 4	✓						
W07 043-436-F1 R2 C5				Impinger 5 & 6	✓						

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
T. Williams	10/22/05	1000		10/22/05	1000
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	10/24/05	1840		10/24	0045
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

ambient Client

Nº 8192

103

182975

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Simi Valley, L.F.	Simi Valley, CA
Project No.	**Field Logbook No.**
W07-043	
Sampler: (Signature)	**Chain of Custody Tape No.**

ANALYSES: CAMS #436 As, Cd, Mn, Zn, Hg, Ni, Cu

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample							REMARKS
W07-043-436-F1-R3 C1	10/21/05			Front 1/2 rinse	✓						Flare #1, R-3
W07-043-436-F1-R3 C2				Filter	✓						
W07-043-436-F1-R3 C3				Impingers 1, 2 & 3	✓						
W07-043-436-F1-R3 C4				Impingers 4	✓						
W07-043-436-F1-R3 C5				Impingers 5 & 6	✓						

	Date	Time		Date	Time
Relinquished by: (Signature)	10/22/05	1000	Received by: (Signature)	10/22/05	1000
Relinquished by: (Signature)	10/22/05	1040	Received by: (Signature) Savanna Curtis	10/24/05	6:40
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

ambient; intact

Nº 8193

104

162915

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Simi Valley, CA	Simi Valley, CA
Project No.	**Field Logbook No.**
WO7-043	
Sampler: (Signature)	**Chain of Custody Tape No.**

ANALYSES: Cr, Cd, Mn, Zn, Hg, Ni, Cu

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample							REMARKS
WO7043-436-F2-R1C1	10/12/05			Front 1/2 rinse	✓						Flare #2, R-1
WO7043-436-F2-R1C2				Filter	✓						
WO7043-436-F2-R1-C3				Impingers 1, 2 & 3	✓						
WO7043-436-F2-R1-C4				Impinger 4	✓						
WO7043-436-F2-R1-C5				Impingers 5 & 6	✓						

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	10/22/05	1000		10/22/05	1600
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	10/24/05	1640	Savanna Curtis	10/24/05	6:45
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

ambient, intact IL

Nº 8194

105

CHAIN OF CUSTODY RECORD

182475

Client/Project Name	Project Location
Simi Valley L.F.	Simi Valley, CA
Project No.	**Field Logbook No.**
W07-043	
Sampler: (Signature)	**Chain of Custody Tape No.**

ANALYSES: CARB 436 As, Cd, Cu, Mn, Ni, Zn, Hg

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample							REMARKS
W07043-436-F2-R2-C1	10/12/05			front ½ rinse	✓						Flare #2, R-2
W07043-436-F2-R2 C2				Filter	✓						
W07043-436-F2 R2 C3				Impingers 1, 2 & 3	✓						
W07043-436-F2 R2 CH				Impinger 4	✓						
W07043-436-F2-R2 C5				Impingers 5 & 6	✓						

5

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	10/22/05	1000		10/22/05	1000
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	10/24/05	1000		10/24/05	10:45 AM
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

AMS, Gat & Mad

Nº 8191

106

182975

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Simi Valley L.F.	Simi Valley, CA
Project No.	**Field Logbook No.**
WO7-043	
Sampler: (Signature)	**Chain of Custody Tape No.**
J. Wilson	

ANALYSES: CARB 436 As, Cu, Cd, Mn, Ni, Ni #6

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	REMARKS
WO7043-436-F2-R3 C1	10/13/05			front ½ rinse	Flare #2, R-3
WO7043-436-F2-R3 C2				Filter	
WO7043-436-F2-R3 C3				Impingers 1, 2 & 3	
WO7043-436-F2-R3 C4				Impinger #4	
WO7043-436-F2-R3 C5				Impingers 5 & 6	

	Date	Time		Date	Time
Relinquished by: (Signature) J. Wilson	10/22/05	1000	Received by: (Signature)	10/22/05	1000
Relinquished by: (Signature)	10/24/05	1640	Received by: (Signature) Laverna Curtis	10/24/05	6:45
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

ambient; intact JL

Nº 8400

107

182975

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Simi Valley L.F	Simi Valley, CA
Project No.	**Field Logbook No.**
W07-043	
Sampler: (Signature)	**Chain of Custody Tape No.**
T. Williams	

ANALYSES: CARB M436 As, Cd, Cu, Mn, Ni, Zn, Hg

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample		REMARKS
W07043-436-BIK-C1	10/13/05			5% HNO_3 / 10% H_2O_2	✓	Blank
W07043-436-BIK-C2				Filter	✓	
W07043-436-BIK-C3				0.1N RINSE HNO_3	✓	
W07043-436-BIK-C4				4% $KMNO_4$ / 10% H_2SO_4	✓	
W07043-436-BIK-C5				↓ ↓	✓	

	Date	Time		Date	Time
Relinquished by: (Signature) T. Williams	10/24/05	1800	Received by: (Signature)	10/24/05	1000
Relinquished by: (Signature)	10/24/05	1810	Received by: (Signature)	10/24/05	7:45
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

ambient

Nº 8290

108

182975

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Simi Valley L.F.	Simi Valley, CA
Project No.	**Field Logbook No.**
W07-043	
Sampler: (Signature)	**Chain of Custody Tape No.**
T. Wilson	

ANALYSES: CARB M436 As, Cd, Cu, Mn, Ni, Zn, Hg

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample		REMARKS
W07043-436-SB C1	10/13/05			QUARTZ P.F. 47mm Q5015	✓	Solution Blank (100 mL)
W07-043-436-SB C2				0.1N HNO_3	✓	
W07-043-436-SB C3				4% $KMnO_4$ / 10% H_2SO_4	✓	
W07-043-436 SB C4				5% HNO_3 / 10% H_2O_2	✓	
W07-043-436 SB C5				8N HCL	✓	

2 SB

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
T. Wilson	10/22/05	1000	MC	10/22/05	1000
MC	10/24/05	1810	Lavanna Curtis	10/24/05	6:45
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

ambient; 4L intact 4L

Nº 8291

109

Curtis & Tompkins, Ltd.

Lab #:	182975	Project#:	STANDARD
Client:	Horizon Air Measurement Services	Location:	Simi Valley, L.F.
Field ID:	W07043-436-F1-R1	Diln Fac:	1.000
Lab ID:	182975-001	Sampled:	10/11/05
Matrix:	Air	Received:	10/24/05
Units:	ug/s		

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Arsenic	1.9	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Cadmium	0.88	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Copper	7.1	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Manganese	4.0	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Mercury (Combined)	ND	0.67	108032	11/22/05	11/22/05	METHOD	EPA 7470A
Mercury (KMnO4)	4.8	0.26	108030	11/22/05	11/22/05	METHOD	EPA 7470A
Nickel	ND	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Zinc	30 b	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B

b= See narrative
ND= Not Detected
RL= Reporting Limit
KMnO4= KMnO4
Combined= Combined

Curtis & Tompkins, Ltd.

Lab #: 182975		Project#:	STANDARD
Client: Horizon Air Measurement Services		Location:	Simi Valley, L.F.
Field ID:	W07043-436-F1-R2	Diln Fac:	1.000
Lab ID:	182975-002	Sampled:	10/11/05
Matrix:	Air	Received:	10/24/05
Units:	ug/s		

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Arsenic	2.4	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Cadmium	0.62	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Copper	3.5	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Manganese	1.4	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Mercury (Combined)	ND	0.58	108032	11/22/05	11/22/05	METHOD	EPA 7470A
Mercury (KMnO4)	5.8	0.27	108030	11/22/05	11/22/05	METHOD	EPA 7470A
Nickel	ND	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Zinc	14 b	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B

b= See narrative
ND= Not Detected
RL= Reporting Limit
KMnO4= KMnO4
Combined= Combined

Curtis & Tompkins, Ltd.

Lab #:	182975	Project#:	STANDARD
Client:	Horizon Air Measurement Services	Location:	Simi Valley, L.F.
Field ID:	W07043-436-F1-R3	Diln Fac:	1.000
Lab ID:	182975-003	Sampled:	10/11/05
Matrix:	Air	Received:	10/24/05
Units:	ug/s		

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Arsenic	2.5	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Cadmium	0.61	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Copper	2.5	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Manganese	2.1	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Mercury (Combined)	ND	0.68	108032	11/22/05	11/22/05	METHOD	EPA 7470A
Mercury (KMnO4)	2.2	0.088	108030	11/22/05	11/22/05	METHOD	EPA 7470A
Nickel	ND	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Zinc	10 b	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B

b= See narrative
ND= Not Detected
RL= Reporting Limit
KMnO4= KMnO4
Combined= Combined

Curtis & Tompkins, Ltd.

Lab #:	182975	Project#:	STANDARD
Client:	Horizon Air Measurement Services	Location:	Simi Valley, L.F.
Field ID:	W07043-436-F2-R1	Diln Fac:	1.000
Lab ID:	182975-004	Sampled:	10/12/05
Matrix:	Air	Received:	10/24/05
Units:	ug/s		

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Arsenic	0.77	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Cadmium	0.63	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Copper	32	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Manganese	1.3	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Mercury (Combined)	ND	0.64	108032	11/22/05	11/22/05	METHOD	EPA 7470A
Mercury (KMnO4)	1.3	0.088	108030	11/22/05	11/22/05	METHOD	EPA 7470A
Nickel	ND	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Zinc	5.5 b	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B

b= See narrative
ND= Not Detected
RL= Reporting Limit
KMnO4= KMnO4
Combined= Combined

Curtis & Tompkins, Ltd.

Lab #:	182975	Project#:	STANDARD
Client:	Horizon Air Measurement Services	Location:	Simi Valley, L.F.
Field ID:	W07043-436-F2-R2	Diln Fac:	1.000
Lab ID:	182975-005	Sampled:	10/12/05
Matrix:	Air	Received:	10/24/05
Units:	ug/s		

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Arsenic	1.0	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Cadmium	0.57	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Copper	2.2	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Manganese	3.0	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Mercury (Combined)	ND	0.67	108032	11/22/05	11/22/05	METHOD	EPA 7470A
Mercury (KMnO4)	1.2	0.088	108030	11/22/05	11/22/05	METHOD	EPA 7470A
Nickel	ND	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Zinc	13 b	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B

b= See narrative
ND= Not Detected
RL= Reporting Limit
KMnO4= KMnO4
Combined= Combined

Curtis & Tompkins, Ltd.

Lab #: 182975		Project#:	STANDARD
Client: Horizon Air Measurement Services		Location:	Simi Valley, L.F.
Field ID:	W07043-436-F2-R3	Diln Fac:	1.000
Lab ID:	182975-006	Sampled:	10/13/05
Matrix:	Air	Received:	10/24/05
Units:	ug/s		

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Arsenic	1.1	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Cadmium	0.51	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Copper	1.8	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Manganese	6.7	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Mercury (Combined)	ND	0.66	108032	11/22/05	11/22/05	METHOD	EPA 7470A
Mercury (KMnO4)	0.86	0.096	108030	11/22/05	11/22/05	METHOD	EPA 7470A
Nickel	3.1	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Zinc	11 b	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B

b= See narrative
ND= Not Detected
RL= Reporting Limit
KMnO4= KMnO4
Combined= Combined

Curtis & Tompkins, Ltd.

Lab #:	182975	Project#:	STANDARD
Client:	Horizon Air Measurement Services	Location:	Simi Valley, L.F.
Field ID:	W07043-436-BLK	Diln Fac:	1.000
Lab ID:	182975-007	Sampled:	10/13/05
Matrix:	Air	Received:	10/24/05
Units:	ug/s		

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Arsenic	ND	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Cadmium	0.59	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Copper	1.2	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Manganese	0.70	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Mercury (Combined)	ND	0.10	108032	11/22/05	11/22/05	METHOD	EPA 7470A
Mercury (KMnO4)	ND	0.060	108030	11/22/05	11/22/05	METHOD	EPA 7470A
Nickel	ND	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Zinc	ND	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B

ND= Not Detected
RL= Reporting Limit
KMnO4= KMnO4
Combined= Combined

Curtis & Tompkins, Ltd.

Lab #:	182975	Project#:	STANDARD
Client:	Horizon Air Measurement Services	Location:	Simi Valley, L.F.
Field ID:	W07043-436-SB	Diln Fac:	1.000
Lab ID:	182975-008	Sampled:	10/13/05
Matrix:	Air	Received:	10/24/05
Units:	ug/s		

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Arsenic	ND	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Cadmium	0.50	0.28	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Copper	3.5	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Manganese	0.95	0.56	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Mercury (Combined)	ND	0.12	108032	11/22/05	11/22/05	METHOD	EPA 7470A
Mercury (KMnO4)	ND	0.096	108030	11/22/05	11/22/05	METHOD	EPA 7470A
Nickel	ND	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B
Zinc	23 b	1.1	107767	11/15/05	11/15/05	CARB 436	EPA 6010B

b= See narrative
ND= Not Detected
RL= Reporting Limit
KMnO4= KMnO4
Combined= Combined

Curtis & Tompkins, Ltd.

Batch QC Report

Lab #:	182975	Location:	Simi Valley, L.F.
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 7470A
Analyte:	Mercury (KMnO4)	Diln Fac:	1.000
Type:	BLANK	Batch#:	108030
Lab ID:	QC318263	Prepared:	11/22/05
Matrix:	Air	Analyzed:	11/22/05
Units:	ug/s		

Result	RL
ND	0.010

ND= Not Detected
RL= Reporting Limit
KMnO4= KMnO4

13.0

Curtis & Tompkins, Ltd.

Batch QC Report

Lab #:	182975	Location:	Simi Valley, L.F.
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 7470A
Analyte:	Mercury (KMnO4)	Batch#:	108030
Matrix:	Air	Prepared:	11/22/05
Units:	ug/s	Analyzed:	11/22/05
Diln Fac:	1.000		

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC318264	0.2500	0.2465	99	80-120		
BSD	QC318265	0.2500	0.2400	96	80-120	3	20

RPD= Relative Percent Difference
KMnO4= KMnO4

Curtis & Tompkins, Ltd.

Batch QC Report

Lab #:	182975	Location:	Simi Valley, L.F.
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 7470A
Analyte:	Mercury (KMnO4)	Diln Fac:	1.000
Field ID:	W07043-436-F2-R1	Batch#:	108030
Type:	SDUP	Sampled:	10/12/05
MSS Lab ID:	182975-004	Received:	10/24/05
Lab ID:	QC318266	Prepared:	11/22/05
Matrix:	Air	Analyzed:	11/22/05
Units:	ug/s		

MSS Result	Result	RL	RPD	Lim
1.294	1.241	0.08803	4	20

RL= Reporting Limit
RPD= Relative Percent Difference
KMnO4= KMnO4

Curtis & Tompkins, Ltd.

Batch QC Report

Lab #:	182975	Location:	Simi Valley, L.F.
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 7470A
Analyte:	Mercury (KMnO4)	Diln Fac:	1.000
Field ID:	W07043-436-F2-R1	Batch#:	108030
Type:	SSPIKE	Sampled:	10/12/05
MSS Lab ID:	182975-004	Received:	10/24/05
Lab ID:	QC318267	Prepared:	11/22/05
Matrix:	Air	Analyzed:	11/22/05
Units:	ug/s		

MSS Result	Spiked	Result	%REC	Limits
1.294	2.201	3.297	91	77-121

MnO4= KMnO4

Curtis & Tompkins, Ltd.

Batch QC Report

Lab #:	182975	Location:	Simi Valley, L.F.
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 7470A
Analyte:	Mercury (Combined)	Diln Fac:	1.000
Type:	BLANK	Batch#:	108032
Lab ID:	QC318274	Prepared:	11/22/05
Matrix:	Air	Analyzed:	11/22/05
Units:	ug/s		

Result	RL
ND	0.010

ND= Not Detected
RL= Reporting Limit
Combined= Combined

Curtis & Tompkins, Ltd.

Batch QC Report

Lab #:	182975	Location:	Simi Valley, L.F.
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 7470A
Analyte:	Mercury (Combined)	Diln Fac:	1.000
Type:	BLANK	Batch#:	108032
Lab ID:	QC318275	Prepared:	11/22/05
Matrix:	Air	Analyzed:	11/22/05
Units:	ug/s		

Result	RL
ND	0.10

ND= Not Detected
RL= Reporting Limit
ombined= Combined

Curtis & Tompkins, Ltd.

Batch QC Report

Lab #:	182975	Location:	Simi Valley, L.F.
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 7470A
Analyte:	Mercury (Combined)	Batch#:	108032
Matrix:	Air	Prepared:	11/22/05
Units:	ug/s	Analyzed:	11/22/05
Diln Fac:	1.000		

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC318276	0.2500	0.2460	98	80-120		
BSD	QC318277	0.2500	0.2480	99	80-120	1	20

RPD= Relative Percent Difference
Combined= Combined

Curtis & Tompkins, Ltd.

Batch QC Report

Lab #:	182975	Location:	Simi Valley, L.F.
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 7470A
Analyte:	Mercury (Combined)	Diln Fac:	1.000
Field ID:	W07043-436-F1-R3	Batch#:	108032
Type:	SDUP	Sampled:	10/11/05
MSS Lab ID:	182975-003	Received:	10/24/05
Lab ID:	QC318278	Prepared:	11/22/05
Matrix:	Air	Analyzed:	11/22/05
Units:	ug/s		

MSS Result	Result	RL	RPD	Lim
<0.6803	ND	0.6803	NC	20

NC= Not Calculated
ND= Not Detected
RL= Reporting Limit
RPD= Relative Percent Difference
ombined= Combined

Curtis & Tompkins, Ltd.

Batch QC Report

Lab #:	182975	Location:	Simi Valley, L.F.
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 7470A
Analyte:	Mercury (Combined)	Diln Fac:	1.000
Field ID:	W07043-436-F1-R3	Batch#:	108032
Type:	SSPIKE	Sampled:	10/11/05
MSS Lab ID:	182975-003	Received:	10/24/05
Lab ID:	QC318279	Prepared:	11/22/05
Matrix:	Air	Analyzed:	11/22/05
Units:	ug/s		

MSS Result	Spiked	Result	%REC	Limits
ND	17.01	15.34	90	77-121

ND= Not Detected
Combined= Combined

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710. Phone (510) 486-0900

ANALYTICAL REPORT

Prepared for:

Horizon Air Measurement Services
996 Lawrence Drive
Suite 108
Newbury Park, CA 91320

Date: 14-DEC-05
Lab Job Number: 183452
Project ID: W07.043
Location: Waste Management

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis.

Reviewed by: _____
Project Manager

Reviewed by: _____
Operations Manager

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**183452**
Client:	**Horizon Air Measurement Services**
Project:	**W07.043**
Location:	**Waste Management**
Request Date:	**11/29/05**
Samples Received:	**11/29/05**

This hardcopy data package contains sample and QC results for eight air samples, requested for the above referenced project on 11/29/05. The samples were received cold and intact.

Metals (EPA 6010B):
No analytical problems were encountered.

Ion Chromatography (EPA 7199):
Low recoveries were observed for hexavalent chromium in the MS/MSD for batch 108212; the parent sample was not a project sample, and the BS/BSD were within limits. No other analytical problems were encountered.

Curtis & Tompkins, Ltd.

Chromium

Lab #:	183452	Location:	Waste Management
Client:	Horizon Air Measurement Services	Prep:	CARB 425
Project#:	W07.043	Analysis:	EPA 6010B
Analyte:	Chromium	Sampled:	11/28/05
Matrix:	Air	Received:	11/29/05
Units:	ug/s	Prepared:	12/01/05
Diln Fac:	1.000	Analyzed:	12/01/05
Batch#:	108263		

Field ID	Type	Lab ID		Result	RL
W743-425-F1-R1	SAMPLE	183452-001		1.5	1.0
W743-425-F1-R2	SAMPLE	183452-002		1.1	1.0
W743-425-F1-R3	SAMPLE	183452-003	ND		1.0
W743-425-F2-R1	SAMPLE	183452-004		1.4	1.0
W743-425-F2-R2	SAMPLE	183452-005		1.1	1.0
W743-425-F2-R3	SAMPLE	183452-006		1.1	1.0
W743-425-FB	SAMPLE	183452-007	ND		1.0
W743-425-SB	SAMPLE	183452-008	ND		1.0
	BLANK	QC319235	ND		1.0

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Chromium

Lab #:	183452	Location:	Waste Management
Client:	Horizon Air Measurement Services	Prep:	CARB 425
Project#:	W07.043	Analysis:	EPA 6010B
Analyte:	Chromium	Batch#:	108263
Field ID:	W743-425-F1-R1	Sampled:	11/28/05
MSS Lab ID:	183452-001	Received:	11/29/05
Matrix:	Air	Prepared:	12/01/05
Units:	ug/s	Analyzed:	12/01/05
Diln Fac:	1.000		

Type	Lab ID	MSS Result	Spiked	Result	RL	%REC	Limits	RPD	Lim
SDUP	QC319236	1.540		1.550	1.000			1	20
SSPIKE	QC319237	1.540	200.0	199.0		99	80-120		

RL= Reporting Limit
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

LAB #: 183452
CLIENT: Horizon Air Measurement Services

HEXAVALENT CHROMIUM ANALYSIS SUMMARY

Lab ID	Field ID	Result ug/sample	Result ug/L	Volume mL
183452-001	W743-425-F1-R1	< 0.32	< 0.50	640
183452-002	W743-425-F1-R2	< 0.34	< 0.50	670
183452-003	W743-425-F1-R3	< 0.33	< 0.50	650
183452-004	W743-425-F2-R1	< 0.33	< 0.50	660
183452-005	W743-425-F2-R2	< 0.33	< 0.50	650
183452-006	W743-425-F2-R3	0.32	0.51	620
183452-007	W743-425-FB	< 0.16	< 0.50	320
183452-008	W743-425-SB	< 0.11	< 0.50	220
QC319026	METHOD BLANK	< 0.15	< 0.50	300

Curtis & Tompkins, Ltd.

Hexavalent Chromium

Lab #:	183452	Location:	Waste Management
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	W07.043	Analysis:	EPA 7199
Analyte:	Hexavalent Chromium	Batch#:	108212
Matrix:	Water	Sampled:	11/28/05
Units:	ug/L	Received:	11/29/05
Diln Fac:	1.000		

Field ID	Type	Lab ID	Result	RL	Analyzed
W743-425-F1-R1	SAMPLE	183452-001	ND	0.50	11/29/05 14:22
W743-425-F1-R2	SAMPLE	183452-002	ND	0.50	11/29/05 14:33
W743-425-F1-R3	SAMPLE	183452-003	ND	0.50	11/29/05 14:45
W743-425-F2-R1	SAMPLE	183452-004	ND	0.50	11/29/05 14:57
W743-425-F2-R2	SAMPLE	183452-005	ND	0.50	11/29/05 15:08
W743-425-F2-R3	SAMPLE	183452-006	0.51	0.50	11/29/05 15:55
W743-425-FB	SAMPLE	183452-007	ND	0.50	11/29/05 14:10
W743-425-SB	SAMPLE	183452-008	ND	0.50	11/29/05 13:59
	BLANK	QC319026	ND	0.50	11/29/05 12:26

ND= Not Detected
RL= Reporting Limit

Batch QC Report

Hexavalent Chromium

Lab #:	183452	Location:	Waste Management
Client:	Horizon Air Measurement Services	Prep:	METHOD
Project#:	W07.043	Analysis:	EPA 7199
Analyte:	Hexavalent Chromium	Batch#:	108212
Matrix:	Water	Received:	11/29/05
Units:	ug/L		

Field ID	Type	MSS Lab ID	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Diln Fac	Sampled	Analyzed
	BS		QC319027		20.00	20.14	101	90-110			1.000		11/29/05 12:38
	BSD		QC319028		20.00	20.49	102	90-110	2	20	1.000		11/29/05 12:50
W743-425-F1-R1	MS	183452-001	QC319029	0.4032	10.00	11.04	106	85-115			1.010	11/28/05	11/29/05 16:26
W743-425-F1-R1	MSD	183452-001	QC319030		10.00	11.09	107	85-115	0	20	1.010	11/28/05	11/29/05 16:37
ZZZZZZZZZZ	MS	183481-002	QC319031	<0.09281	10.10	0	0 *	85-115			1.020	11/29/05 13:21	11/29/05 17:42
ZZZZZZZZZZ	MSD	183481-002	QC319032		10.10	0	0 *	85-115	NC	20	1.020	11/29/05 13:21	11/29/05 17:54

*= Value outside of QC limits; see narrative
NC= Not Calculated
RPD= Relative Percent Difference

183452

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
WASTE MANAGEMENT	SIMI VALLEY, CA
Project No.	**Field Logbook No.**
W07.043	1
Sampler: (Signature)	**Chain of Custody Tape No.**

ANALYSES: CARB METHOD 425 HEXAVALENT CHROMIUM and TOTAL CHROMIUM

	Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample							REMARKS
-1	W743 425-F1-PR.1				PROBE RINSE	✓						
-2	-IMP1.1				IMPINGER 1 & FILTER	✓						
-3	-IMP2.1				IMPINGER 2	✓						
-4	-PR.2					✓						
-5	-IMP1.2					✓						
-6	-IMP2.2					✓						
-7	-PR.3					✓						
-8	-IMP1.3					✓						

	Date	Time		Date	Time
Relinquished by: (Signature)	11-28-05		Received by: (Signature) UPS# 1Z835E82 0193876313	11-28-05	
Relinquished by: (Signature) UPS			Received by: (Signature)	11-29-05	10⁰⁰
Relinquished by: (Signature)			Received for Laboratory: (Signature)		
Sample Disposal Method:			Disposed of by: (Signature)		

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

CURTIS AND TOMPKINS

Nº 09005

183452

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Waste Management	SIMI VALLEY, CA
Project No.	**Field Logbook No.**
W07.043	1
Sampler: (Signature)	**Chain of Custody Tape No.**

ANALYSES: CARB METHOD 425 HEXAVALENT CHROMIUM AND TOTAL CHROMIUM

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample		REMARKS
-9 W743.425.F1.IMP2.R3					✓	
W743.425.F2.PR.1 -10					✓	
-11 .IMP1.1					✓	
★ .IMP2.2					✓	
-12 .PR.2					✓	
-13 .IMP1.2					✓	
-14 .MP2.2					✓	
#15 .PR.3					✓	

	Date	Time		Date	Time
Relinquished by: (Signature)	11-29-05		Received by: (Signature) UPS# 1Z835E920193578313	11-29-05	
Relinquished by: (Signature) UPS			Received by: (Signature)	11-29-05	1000
Relinquished by: (Signature)			Received for Laboratory: (Signature)		
Sample Disposal Method:			Disposed of by: (Signature)		

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

CURTIS AND TOMPKINS LTD

№ 09003

135

F2-PR-1 Labeled F1-PR-1 Id'd by Bottle lid #'s
F2-IMP-1 Labelled F1-IMP-1 " "

★ No Sample received Labeled W743.425.F2.IMP2.2

183452

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
WASTE MANAGEMENT	SIMI VALLEY, CA
Project No.	**Field Logbook No.**
W07.043	1
Sampler: (Signature)	**Chain of Custody Tape No.**

ANALYSES: CARB METHOD 425 HEXAVALENT CHROMIUM and TOTAL CHROMIUM

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	REMARKS
-16 W743-425-F2-IMP1-3				✓	
-17 " -IMP2-3				✓	
W743-425-FB-PR- -18				✓	
-19 -FB-IMP1				✓	FIELD BLANK
-20 -FB-IMP2				✓	
-21 -SB				✓	SOLUTION BLANK 200 ml
-22 W743-425 F1 IMP2-1 (Lid says F2)	(F2)				

	Date	Time		Date	Time
Relinquished by: (Signature)	11-28-05		Received by: (Signature) UPS # 1Z835E820193578313	11-28-05	
Relinquished by: (Signature) UPS			Received by: (Signature)	11-29-05	10 00
Relinquished by: (Signature)			Received for Laboratory: (Signature)		
Sample Disposal Method:			Disposed of by: (Signature)		

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

CURTIS and TOMPKINS

Nº 09004

C# Sample received not on coc W743-425-F1-IMP2-1 (Lid says F2) F2 written on container Lid. (PP) Logged in for similar analysis (PP)

Rich Vacherot

From: "John Goyette" <goyette@ctberk.com>
To: <rich@horizonairmeasurement.com>
Sent: Friday, November 11, 2005 3:55 PM
Attach: 183047_COC.pdf; 183047_RPTS.pdf
Subject: Simi Valley, L.F. - C&T Reports (183047)

Rich, I have some very bad news for you. Due do a laboratory miscommunication error, we acidified these samples before an aliquot was removed for hexavalent chromium analysis, thus nullifying the samples for hex chrom. I am very sorry that this happened. You can call me at 510-204-2233 to disucss further. -John Goyette

Attached is a PDF version of the hardcopy reports for C&T job 183047.

Email compiled and sent 11/11/05 03:55 PM.

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Chromium

Lab #:	183047	Location:	Simi Valley, L.F.
Client:	Horizon Air Measurement Services	Prep:	CARB 425
Project#:	STANDARD	Analysis:	EPA 6010B
Analyte:	Chromium	Batch#:	107662
Matrix:	Air	Received:	10/24/05
Units:	ug/s	Prepared:	11/11/05
Diln Fac:	1.000	Analyzed:	11/11/05

Field ID	Type	Lab ID	Result	RL	Sampled
07-043-425-F1-R1	SAMPLE	183047-001	0.83	0.50	10/17/05
07-043-425-F1-R2	SAMPLE	183047-002	1.1	0.50	10/18/05
07-043-425-F1-R3	SAMPLE	183047-003	1.1	0.50	10/18/05
07-043-425-F2-R1	SAMPLE	183047-004	1.6	0.50	10/19/05
07-043-425-F2-R2	SAMPLE	183047-005	1.4	0.50	10/20/05
07-043-425-F2-R3	SAMPLE	183047-006	1.3	0.50	10/21/05
07-043-425-FB-C1	SAMPLE	183047-007	0.60	0.50	10/18/05
07-043-425-FB-C2	SAMPLE	183047-008	0.72	0.50	10/18/05
07-043-425-SB	SAMPLE	183047-009	0.66	0.50	10/18/05
	BLANK	QC316737	ND	0.50	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Batch QC Report

Chromium

Lab #:	183047	Location:	Simi Valley, L.F.
Client:	Horizon Air Measurement Services	Prep:	CARB 425
Project#:	STANDARD	Analysis:	EPA 6010B
Analyte:	Chromium	Batch#:	107662
Field ID:	07-043-425-F1-R1	Sampled:	10/17/05
MSS Lab ID:	183047-001	Received:	10/24/05
Matrix:	Air	Prepared:	11/11/05
Units:	ug/s	Analyzed:	11/11/05
Diln Fac:	1.000		

Type	Lab ID	MSS Result	Spiked	Result	RL	%REC	Limits	RPD	Lim
SDUP	QC316738	0.8250		0.7950	0.5000			4	20
SSPIKE	QC316739	0.8250	100.0	96.50		96	80-120		

RL= Reporting Limit
RPD= Relative Percent Difference

CHAIN OF CUSTODY RECORD

183041

Client/Project Name	Project Location
Simi Valley L.F.	Simi Valley, CA

Project No.	Field Logbook No.
W07-043	

Sampler: (Signature)	Chain of Custody Tape No.

ANALYSES

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	Cl⁻						REMARKS
7-043-425-F1-R1 C1	10/14/05			Nozzle/probe rinse	X						Flare #1 Run #1
7-043-425-F1-R1 C2	15			filter + impinger rinse	X						↓
7-043-425-F1-R2 C1	10min los			nozzle/probe rinse	X						Run #2
7-043-425-F1-R2 C2	12			filter + impinger rinse	X						
7-043-425-F1-R3 C1				nozzle/probe rinse	X						Run #3
7-043-425-F1-R3 C2	13			filter + impinger rinse	X						

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR	ANALYTICAL LABORATORY
HORIZON AIR MEASUREMENT SERVICES, INC 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781 Fax (805) 498-3173	Nº 8395

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CHAIN OF CUSTODY RECORD

183047

Client/Project Name	Project Location
Simi Valley L.F	Simi Valley, CA

Project No.	Field Logbook No.
W07-043	

Sampler: (Signature)	Chain of Custody Tape No.

ANALYSES: EPA METHOD 25 — CO2 / TOC

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample							REMARKS
3425 F2 R1 C2	10/19/05				✓						Impl + Rinse
3425 F2 R1 C3	10/19/05				✓						Imp2 + Rinse
3425 F2 R1 C1	10/19/05				✓						Probe Rinse
3425 F2 R2 C2	10/20/05				✓						Imp 1 + Rinse
3425 F2 R2 C3	10/20/05				✓						Imp 2 + Rinse
3425 F2 R2 C1	10/20/05				✓						Probe Rinse

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

No 8472

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CHAIN OF CUSTODY RECORD

183047

Client/Project Name	Project Location
Simi Valley L.F	Simi Valley CA
Project No.	**Field Logbook No.**
1007-01.2	
Sampler: (Signature)	**Chain of Custody Tape No.**

ANALYSES

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	Method CH4 / TO-14 CO	REMARKS
VOR043425F2R3	C2	10/21/05			✓	Imp 1 + Rinse + F. Pump
VL90 43425 F2R3	C3	10/21/05			✓	2nd Imp + Rinse
VOR043425F2R3	C1	10/21/05			✓	Probe / Impactor + Rinse

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	**Date**	**Time**	**Received by: (Signature)**	**Date**	**Time**
Relinquished by: (Signature)	**Date**	**Time**	**Received for Laboratory: (Signature)**	**Date**	**Time**
Sample Disposal Method:	**Disposed of by: (Signature)**			**Date**	**Time**

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Nº 8478

CHAIN OF CUSTODY RECORD

183047

Client/Project Name	Project Location
Simi Valley L.F.	Simi Valley, CA
Project No.	**Field Logbook No.**
IW7-043	
Sampler: (Signature)	**Chain of Custody Tape No.**
Jim Wilkin	

ANALYSES: Hexavalent Chromium (EPA 7196A) | Total Chromium (EPA 6010B)

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	Hexavalent Chromium (EPA 7196A)	Total Chromium (EPA 6010B)	REMARKS
IW7-043425 FB C1	10/18/05		-7		X		Field Blank Probe Rinse
IW7-043425 FB C2	10/18/05		-8		X		Field Blank Imp. Rinse + Filter
IW7-045425-S13	10/18/05		-9	Solution 250ml + Filter	X		Filter plus Solution Blank (250 ml)

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Jim Wilkin					
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Nº 8462

ALTA

November 12, 2005

Alta Project I.D.: 26831

Mr. Richard Vacherot
Horizon Air Measurements
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Dear Mr. Vacherot,

Enclosed are the results for seven of the eight MM5 samples received at Alta Analytical Laboratory on October 24, 2005 under your Project Name "Simi Valley L.F.". These samples were extracted and analyzed using CARB Method 429 for PAHs and Modified EPA Method 1625 for hexachlorobenzene. A standard turnaround time was provided for this work.

The following report consists of a Sample Inventory (Section I), Analytical Results (Section II) and the Appendix, which contains the chain-of-custody, a list of data qualifiers and abbreviations, Alta's current certifications, and copies of the raw data (if requested).

Alta Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-933-1640 or by email at mmaier@altalab.com. Thank you for choosing Alta as part of your analytical support team.

Sincerely,

Martha M. Maier
Director of HRMS Services

ACCREDITED IN ACCORDANCE WITH nelac

nelac

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Alta Analytical Laboratory Inc.
1104 Windfield Way
El Dorado Hills, CA 95762
FAX (916) 673-0106
(916) 933-1640

Section I: Sample Inventory Report

Date Received: 10/24/2005
Project No.: 26831
Project Name: Simi Valley L.F.

Lab. Sample ID	Client Sample ID	Component ID
001	W07043-429-F1-R1	FILTER
		IMP CONTENT
		IMP RINSE
		RINSE(BACK HALF)
		RINSE(PROBE)
		XAD
002	W07043-429-F1-R2	FILTER
		IMP CONTENT
		IMP RINSE
		RINSE(BACK HALF)
		RINSE(PROBE)
		XAD
003	W07043-429-F1-R3	FILTER
		IMP CONTENT
		IMP RINSE
		RINSE(BACK HALF)
		RINSE(PROBE)
		XAD
004	W07043-429-F2-R1	FILTER
		IMP CONTENT
		IMP RINSE
		RINSE(BACK HALF)
		RINSE(PROBE)
		XAD
005	W07043-429-F2-R2	FILTER
		IMP CONTENT
		IMP RINSE
		RINSE(BACK HALF)
		RINSE(PROBE)
		XAD
006	W07043-429-F2-R3	FILTER
		IMP CONTENT
		IMP RINSE
		RINSE(BACK HALF)

Smpinvgnmm5.rpt

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Section I: Sample Inventory Report

Date Received: 10/24/2005
Project No.: 26831
Project Name: Simi Valley L.F.

Lab. Sample ID	Client Sample ID	Component ID
006	W07043-429-F2-R3	RINSE(PROBE)
		XAD
007	W07043-429-FB	FILTER
		IMP CONTENT
		IMP RINSE
		RINSE(BACK HALF)
		RINSE(PROBE)
		XAD
008	W07043-429-SB	ACETONE
		HEXANE
		MeCL2
		PAH SOLUTION

Smpinvgnmm5.rpt

SECTION II

ALTA

Method Blank				Modified EPA Method 1625			
Matrix:	MM5	QC Batch No.:	7379	Lab Sample:	0-MB001		
Sample Size:	Sample	Date Extracted:	3-Nov-05	Date Analyzed DB-5:	7-Nov-05		

Analyte	Conc. (ng/Sample)	RL[a]	Qualifiers	Labeled Standard[c]	%R	LCL-UCL[d]	Qualifiers
Hexachlorobenzene	ND	0.256		IS 13C-Hexachlorobenzene	73.2	13 - 595	
				AS d10-Anthracene	78.9	13 - 595	

a. Sample specific estimated detection limit.
b. Estimated maximum possible concentration.
c. Method detection limit.
d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 12-Nov-2005 13:06

LCS Results — Modified EPA Method 1625

Matrix:	MM5	QC Batch No.:	7379	Lab Sample:	0-001LCS1/LCS2
Sample Size:	Sample	Date Extracted:	3-Nov-05	Date Analyzed DB-5:	7-Nov-05

Analyte	LCS1-%R	LCS2-%R	%-RPD
Hexachlorobenzene	102	103	0.976

IS Type	Internal Standard	LCS1-%R	LCS2-%R
IS	13C-Hexachlorobenzene	68.8	65.6
CRS	d10-Anthracene	77.2	74.6

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ALTA

Sample ID:	W07043-429-F1-R1			Modified EPA Method 1625	
Client Data		**Sample Data**		**Laboratory Data**	
Name:	Horizon Air Measurements	Matrix:	MM5	Lab Sample:	26831-001
Project:	Simi Valley L.F.	Sample Size:	Sample	QC Batch No.:	7379
Date Collected:	13-Oct-05			Date Analyzed DB-5:	7-Nov-05
Time Collected:	NA			Date Received:	24-Oct-05
				Date Extracted:	3-Nov-05

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers		Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
Hexachlorobenzene	1.61		J	IS	13C-Hexachlorobenzene	63.6	13 - 595	
				AS	d10-Anthracene	87.7	13 - 595	

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 12-Nov-2005 13:06

Sample ID:	W07043-429-F1-R2			Modified EPA Method 1625	
Client Data		**Sample Data**		**Laboratory Data**	
Name:	Horizon Air Measurements	Matrix:	MM5	Lab Sample:	26831-002
Project:	Simi Valley L.F.	Sample Size:	Sample	QC Batch No.:	7379
Date Collected:	14-Oct-05			Date Analyzed DB-5:	7-Nov-05
Time Collected:	NA				

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers
Hexachlorobenzene	0.815		J

	Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
IS	13C-Hexachlorobenzene	61.2	13 - 595	
AS	d10-Anthracene	86.5	13 - 595	

a. Sample specific estimated detection limit.
b. Estimated maximum possible concentration.
c. Method detection limit.
d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 12-Nov-2005 13:06

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ALTA

Sample ID:	W07043-429-F1-R3			Modified EPA Method 1625	
Client Data		**Sample Data**		**Laboratory Data**	
Name:	Horizon Air Measurements	Matrix:	MM5	Lab Sample:	26831-003
Project:	Simi Valley L.F.	Sample Size:	Sample	QC Batch No.:	7379
Date Collected:	17-Oct-05			Date Analyzed DB-5:	7-Nov-05
Time Collected:	NA				

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers		Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
Hexachlorobenzene	1.11		J	IS	13C-Hexachlorobenzene	57.8	13 - 595	
				AS	d10-Anthracene	82.2	13 - 595	

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 12-Nov-2005 13:06

ALTA

Sample ID:	W07043-429-F2-R1			Modified EPA Method 1625	
Client Data		**Sample Data**		**Laboratory Data**	
Name:	Horizon Air Measurements	Matrix:	MM5	Lab Sample:	26831-004
Project:	Simi Valley L.F.	Sample Size:	Sample	QC Batch No.:	7379
Date Collected:	19-Oct-05			Date Analyzed DB-5:	7-Nov-05
Time Collected:	NA				

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers		Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
Hexachlorobenzene	0.450		J	IS	13C-Hexachlorobenzene	68.9	13 - 595	
				AS	d10-Anthracene	84.7	13 - 595	

a. Sample specific estimated detection limit.
b. Estimated maximum possible concentration.
c. Method detection limit.
d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 12-Nov-2005 13:06

ALTA

Sample ID:	W07043-429-F2-R2			Modified EPA Method 1625	
Client Data		**Sample Data**		**Laboratory Data**	
Name:	Horizon Air Measurements	Matrix:	MM5	Lab Sample:	26831-005
Project:	Simi Valley L.F.	Sample Size:	Sample	QC Batch No.:	7379
Date Collected:	20-Oct-05			Date Analyzed DB-5:	7-Nov-05
Time Collected:	NA				

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers
Hexachlorobenzene	0.462		J

	Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
IS	13C-Hexachlorobenzene	78.9	13 - 595	
AS	d10-Anthracene	76.7	13 - 595	

a. Sample specific estimated detection limit.
b. Estimated maximum possible concentration.
c. Method detection limit.
d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 12-Nov-2005 13:06

ALTA

Sample ID:	W07043-429-F2-R3				Modified EPA Method 1625
Client Data		**Sample Data**		**Laboratory Data**	
Name:	Horizon Air Measurements	Matrix:	MM5	Lab Sample:	26831-006
Project:	Simi Valley L.F.	Sample Size:	Sample	QC Batch No.:	7379
Date Collected:	21-Oct-05			Date Analyzed DB-5:	7-Nov-05
Time Collected:	NA				

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers	Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
Hexachlorobenzene	1.54		J	IS 13C-Hexachlorobenzene	58.6	13 - 595	
				AS d10-Anthracene	91.8	13 - 595	

a. Sample specific estimated detection limit.
b. Estimated maximum possible concentration.
c. Method detection limit.
d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 12-Nov-2005 13:06

ALTA

Sample ID:	W07043-429-FB			Modified EPA Method 1625	
Client Data		**Sample Data**		**Laboratory Data**	
Name:	Horizon Air Measurements	Matrix:	MM5	Lab Sample:	26831-007
Project:	Simi Valley L.F.	Sample Size:	Sample	QC Batch No.:	7379
Date Collected:	13-Oct-05			Date Analyzed DB-5:	9-Nov-05
Time Collected:	NA			Date Received:	24-Oct-05
				Date Extracted:	3-Nov-05

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers		Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
Hexachlorobenzene	0.343		J	IS	13C-Hexachlorobenzene	103	13 - 595	
				AS	d10-Anthracene	74.1	13 - 595	

a. Sample specific estimated detection limit.
b. Estimated maximum possible concentration.
c. Method detection limit.
d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 12-Nov-2005 13:06

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ALTA

Method Blank — **CARB Method 429**

Matrix:	MM5	QC Batch No.:	7379	Lab Sample:	0-MB001
Sample Size:	Sample	Date Extracted:	3-Nov-05	Date Analyzed DB-5:	8-Nov-05

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers
Naphthalene	77.9	50.0	
2-Methylnaphthalene	25.9	20.0	
Acenaphthylene	0.588	20.0	
Acenaphthene	2.07	20.0	
Fluorene	5.55	20.0	
Phenanthrene	14.0	50.0	
Anthracene	1.99	20.0	
Fluoranthene	2.89	20.0	
Pyrene	1.69	20.0	
Benz(a)anthracene	0.456	20.0	
Chrysene	0.894	20.0	
Benzo(b)fluoranthene	1.09	20.0	
Benzo(k)fluoranthene	0.693	20.0	
Benzo(e)pyrene	0.548	20.0	
Benzo(a)pyrene	0.794	20.0	
Perylene	0.654	20.0	
Indeno(1,2,3-c,d)pyrene	0.798	20.0	
Dibenz(a,h)anthracene	0.520	20.0	
Benzo(g,h,i)perylene	0.649	20.0	

	Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
IS	d8-Naphthalene	70.3	50 - 150	
	d8-Acenaphthylene	70.5	50 - 150	
	d10-Acenaphthene	70.9	50 - 150	
	d10-Fluorene	75.1	50 - 150	
	d10-Phenanthrene	66.2	50 - 150	
	d10-Fluoranthene	79.9	50 - 150	
	d12-Benz(a)anthracene	75.7	50 - 150	
	d12-Chrysene	81.5	50 - 150	
	d12-Benzo(b)fluoranthene	86.0	50 - 150	
	d12-Benzo(k)fluoranthene	82.9	50 - 150	
	d12-Benzo(a)pyrene	75.9	50 - 150	
	d12-Indeno(1,2,3-c,d)pyrene	86.5	50 - 150	
	d14-Dibenz(a,h)anthracene	88.2	50 - 150	
	d12-Benzo(g,h,i)perylene	84.1	50 - 150	
PS	d14-Terphenyl	99.6	50 - 150	
	d12-Benzo(e)pyrene	101	50 - 150	
AS	d10-Anthracene	67.4	50 - 150	

a. Reporting limit.
b. Method detection limit.
c. IS; Internal Standards
d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 11-Nov-2005 15:21

LCS Results — CARB Method 429

Matrix:	MM5	QC Batch No.:	7379	Lab Sample:	0-001LCS1/LCS2
Sample Size:	Sample	Date Extracted:	3-Nov-05	Date Analyzed DB-5:	8-Nov-05

Analyte	LCS1-%R	LCS2-%R	%-RPD
Naphthalene	108	107	0.930
2-Methylnaphthalene	95.8	103	7.24
Acenaphthylene	97.5	104	6.45
Acenaphthene	98.8	106	7.03
Fluorene	98.5	95.5	3.09
Phenanthrene	96.9	108	10.8
Anthracene	89.0	97.8	9.42
Fluoranthene	96.5	96.8	0.310
Pyrene	96.5	96.5	0
Benz(a)anthracene	96.8	97.8	1.03
Chrysene	99.8	102	2.18
Benzo(b)fluoranthene	97.0	105	7.92
Benzo(k)fluoranthene	97.2	94.0	3.35
Benzo(e)pyrene	93.5	91.2	2.49
Benzo(a)pyrene	106	106	0
Perylene	106	106	0
Indeno(1,2,3-c,d)pyrene	97.8	97.2	0.615
Dibenz(a,h)anthracene	94.5	95.5	1.05
Benzo(g,h,i)perylene	99.5	99.0	0.504

IS Type	Internal Standard	LCS1-%R	LCS2-%R
IS	d8-Naphthalene	64.0	68.0
	d8-Acenaphthylene	72.2	71.8
	d10-Acenaphthene	72.2	69.9
	d10-Fluorene	75.6	77.0
	d10-Phenanthrene	80.4	73.2
	d10-Fluoranthene	80.1	84.7
	d12-Benz(a)anthracene	85.1	84.2
	d12-Chrysene	82.5	83.5
	d12-Benzo(b)fluoranthene	89.7	90.5
	d12-Benzo(k)fluoranthene	88.7	95.4
	d12-Benzo(a)pyrene	79.4	81.8
	d12-Indeno(1,2,3-c,d)pyrene	92.2	96.3
	d14-Dibenz(a,h)anthracene	94.6	96.6
	d12-Benzo(g,h,i)perylene	89.1	92.5
PS	d14-Terphenyl	NA	NA
	d12-Benzo(e)pyrene	NA	NA
AS	d10-Anthracene	72.5	75.4

ALTA

Sample ID:	W07043-429-F1-R1			CARB Method 429
Client Data		**Sample Data**		**Laboratory Data**
Name:	Horizon Air Measurements	Matrix:	MM5	Lab Sample: 26831-001
Project:	Simi Valley L.F.	Sample Size:	Sample	QC Batch No.: 7379
Date Collected:	13-Oct-05			Date Analyzed DB-5: 8-Nov-05
Time Collected:	NA			Date Received: 24-Oct-05
				Date Extracted: 3-Nov-05

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers
Naphthalene	400	390	B
2-Methylnaphthalene	226	130	B
Acenaphthylene	ND	20.0	
Acenaphthene	34.6	20.0	
Fluorene	133	20.0	
Phenanthrene	670	50.0	
Anthracene	ND	20.0	
Fluoranthene	104	20.0	
Pyrene	69.3	20.0	
Benz(a)anthracene	ND	20.0	
Chrysene	25.9	20.0	
Benzo(b)fluoranthene	23.5	20.0	
Benzo(k)fluoranthene	ND	20.0	
Benzo(e)pyrene	ND	20.0	
Benzo(a)pyrene	ND	20.0	
Perylene	ND	20.0	
Indeno(1,2,3-c,d)pyrene	ND	20.0	
Dibenz(a,h)anthracene	ND	20.0	
Benzo(g,h,i)perylene	ND	20.0	

	Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
IS	d8-Naphthalene	62.3	50 - 150	
	d8-Acenaphthylene	75.9	50 - 150	
	d10-Acenaphthene	71.2	50 - 150	
	d10-Fluorene	87.9	50 - 150	
	d10-Phenanthrene	102	50 - 150	
	d10-Fluoranthene	85.5	50 - 150	
	d12-Benz(a)anthracene	73.9	50 - 150	
	d12-Chrysene	71.5	50 - 150	
	d12-Benzo(b)fluoranthene	99.0	50 - 150	
	d12-Benzo(k)fluoranthene	100	50 - 150	
	d12-Benzo(a)pyrene	82.3	50 - 150	
	d12-Indeno(1,2,3-c,d)pyrene	91.4	50 - 150	
	d14-Dibenz(a,h)anthracene	96.4	50 - 150	
	d12-Benzo(g,h,i)perylene	89.6	50 - 150	
PS	d14-Terphenyl	96.6	50 - 150	
	d12-Benzo(e)pyrene	92.8	50 - 150	
AS	d10-Anthracene	83.9	50 - 150	

a. Reporting limit.

b. Method detection limit.

c. IS; Internal Standards, PS; Pre-Spike Surrogates.

d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 11-Nov-2005 15:21

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ALTA

Sample ID:	W07043-429-F1-R2			CARB Method 429	
Client Data		**Sample Data**		**Laboratory Data**	
Name:	Horizon Air Measurements	Matrix:	MM5	Lab Sample:	26831-002
Project:	Simi Valley L.F.	Sample Size:	Sample	QC Batch No.:	7379
Date Collected:	14-Oct-05			Date Analyzed DB-5:	8-Nov-05
Time Collected:	NA				
				Date Received:	24-Oct-05
				Date Extracted:	3-Nov-05

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers
Naphthalene	401	390	B
2-Methylnaphthalene	176	130	B
Acenaphthylene	ND	20.0	
Acenaphthene	ND	20.0	
Fluorene	44.4	20.0	
Phenanthrene	243	50.0	
Anthracene	34.3	20.0	
Fluoranthene	86.6	20.0	
Pyrene	61.3	20.0	
Benz(a)anthracene	ND	20.0	
Chrysene	51.3	20.0	
Benzo(b)fluoranthene	29.8	20.0	
Benzo(k)fluoranthene	ND	20.0	
Benzo(e)pyrene	25.8	20.0	
Benzo(a)pyrene	ND	20.0	
Perylene	ND	20.0	
Indeno(1,2,3-c,d)pyrene	ND	20.0	
Dibenz(a,h)anthracene	ND	20.0	
Benzo(g,h,i)perylene	ND	20.0	

	Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
IS	d8-Naphthalene	71.2	50 - 150	
	d8-Acenaphthylene	69.0	50 - 150	
	d10-Acenaphthene	65.7	50 - 150	
	d10-Fluorene	79.2	50 - 150	
	d10-Phenanthrene	81.0	50 - 150	
	d10-Fluoranthene	84.1	50 - 150	
	d12-Benz(a)anthracene	80.1	50 - 150	
	d12-Chrysene	77.9	50 - 150	
	d12-Benzo(b)fluoranthene	93.4	50 - 150	
	d12-Benzo(k)fluoranthene	93.1	50 - 150	
	d12-Benzo(a)pyrene	82.1	50 - 150	
	d12-Indeno(1,2,3-c,d)pyrene	88.6	50 - 150	
	d14-Dibenz(a,h)anthracene	90.1	50 - 150	
	d12-Benzo(g,h,i)perylene	85.0	50 - 150	
PS	d14-Terphenyl	102	50 - 150	
	d12-Benzo(e)pyrene	98.4	50 - 150	
AS	d10-Anthracene	69.5	50 - 150	

a. Reporting limit.
b. Method detection limit.
c. IS; Internal Standards, PS; Pre-Spike Surrogates.
d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 11-Nov-2005 15:21

ALTA

Sample ID:	W07043-429-F1-R3			CARB Method 429
Client Data		**Sample Data**	**Laboratory Data**	
Name:	Horizon Air Measurements	Matrix: MM5	Lab Sample: 26831-003	Date Received: 24-Oct-05
Project:	Simi Valley L.F.	Sample Size: Sample	QC Batch No.: 7379	Date Extracted: 3-Nov-05
Date Collected:	17-Oct-05		Date Analyzed DB-5: 8-Nov-05	
Time Collected:	NA			

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers
Naphthalene	207	390	B
2-Methylnaphthalene	72.7	130	B
Acenaphthylene	ND	20.0	
Acenaphthene	ND	20.0	
Fluorene	21.6	20.0	
Phenanthrene	96.6	50.0	
Anthracene	ND	20.0	
Fluoranthene	25.0	20.0	
Pyrene	ND	20.0	
Benz(a)anthracene	ND	20.0	
Chrysene	ND	20.0	
Benzo(b)fluoranthene	ND	20.0	
Benzo(k)fluoranthene	ND	20.0	
Benzo(e)pyrene	ND	20.0	
Benzo(a)pyrene	ND	20.0	
Perylene	ND	20.0	
Indeno(1,2,3-c,d)pyrene	ND	20.0	
Dibenz(a,h)anthracene	ND	20.0	
Benzo(g,h,i)perylene	ND	20.0	

	Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
IS	d8-Naphthalene	69.1	50 - 150	
	d8-Acenaphthylene	70.5	50 - 150	
	d10-Acenaphthene	73.7	50 - 150	
	d10-Fluorene	76.5	50 - 150	
	d10-Phenanthrene	76.0	50 - 150	
	d10-Fluoranthene	83.9	50 - 150	
	d12-Benz(a)anthracene	78.5	50 - 150	
	d12-Chrysene	82.1	50 - 150	
	d12-Benzo(b)fluoranthene	91.7	50 - 150	
	d12-Benzo(k)fluoranthene	93.6	50 - 150	
	d12-Benzo(a)pyrene	82.3	50 - 150	
	d12-Indeno(1,2,3-c,d)pyrene	92.7	50 - 150	
	d14-Dibenz(a,h)anthracene	96.1	50 - 150	
	d12-Benzo(g,h,i)perylene	89.7	50 - 150	
PS	d14-Terphenyl	104	50 - 150	
	d12-Benzo(e)pyrene	97.5	50 - 150	
AS	d10-Anthracene	70.5	50 - 150	

a. Reporting limit.

b. Method detection limit.

c. IS; Internal Standards, PS; Pre-Spike Surrogates.

d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 11-Nov-2005 15:21

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ALTA

Sample ID: W07043-429-F2-R1 **CARB Method 429**

Client Data		Sample Data		Laboratory Data			
Name:	Horizon Air Measurements	Matrix:	MM5	Lab Sample:	26831-004	Date Received:	24-Oct-05
Project:	Simi Valley L.F.	Sample Size:	Sample	QC Batch No.:	7379	Date Extracted:	3-Nov-05
Date Collected:	19-Oct-05			Date Analyzed DB-5:	8-Nov-05		
Time Collected:	NA						

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers
Naphthalene	372	390	B
2-Methylnaphthalene	94.3	130	B
Acenaphthylene	ND	20.0	
Acenaphthene	ND	20.0	
Fluorene	25.3	20.0	
Phenanthrene	120	50.0	
Anthracene	ND	20.0	
Fluoranthene	61.0	20.0	
Pyrene	55.2	20.0	
Benz(a)anthracene	ND	20.0	
Chrysene	23.3	20.0	
Benzo(b)fluoranthene	ND	20.0	
Benzo(k)fluoranthene	ND	20.0	
Benzo(e)pyrene	ND	20.0	
Benzo(a)pyrene	ND	20.0	
Perylene	ND	20.0	
Indeno(1,2,3-c,d)pyrene	ND	20.0	
Dibenz(a,h)anthracene	ND	20.0	
Benzo(g,h,i)perylene	ND	20.0	

	Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
IS	d8-Naphthalene	69.7	50 - 150	
	d8-Acenaphthylene	76.4	50 - 150	
	d10-Acenaphthene	68.5	50 - 150	
	d10-Fluorene	75.1	50 - 150	
	d10-Phenanthrene	81.2	50 - 150	
	d10-Fluoranthene	84.7	50 - 150	
	d12-Benz(a)anthracene	82.8	50 - 150	
	d12-Chrysene	82.7	50 - 150	
	d12-Benzo(b)fluoranthene	94.8	50 - 150	
	d12-Benzo(k)fluoranthene	96.0	50 - 150	
	d12-Benzo(a)pyrene	83.2	50 - 150	
	d12-Indeno(1,2,3-c,d)pyrene	90.9	50 - 150	
	d14-Dibenz(a,h)anthracene	93.6	50 - 150	
	d12-Benzo(g,h,i)perylene	88.6	50 - 150	
PS	d14-Terphenyl	107	50 - 150	
	d12-Benzo(e)pyrene	96.2	50 - 150	
AS	d10-Anthracene	75.7	50 - 150	

a. Reporting limit.

b. Method detection limit.

c. IS; Internal Standards, PS; Pre-Spike Surrogates.

d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 11-Nov-2005 15:21

ALTA

Sample ID:	W07043-429-F2-R2		CARB Method 429
Client Data		**Sample Data**	**Laboratory Data**
Name:	Horizon Air Measurements	Matrix: MM5	Lab Sample: 26831-005 Date Received: 24-Oct-05
Project:	Simi Valley L.F.	Sample Size: Sample	QC Batch No.: 7379 Date Extracted: 3-Nov-05
Date Collected:	20-Oct-05		Date Analyzed DB-5: 8-Nov-05
Time Collected:	NA		

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers
Naphthalene	291	390	B
2-Methylnaphthalene	98.0	130	B
Acenaphthylene	ND	20.0	
Acenaphthene	ND	20.0	
Fluorene	26.2	20.0	
Phenanthrene	101	50.0	
Anthracene	ND	20.0	
Fluoranthene	26.5	20.0	
Pyrene	24.0	20.0	
Benz(a)anthracene	ND	20.0	
Chrysene	ND	20.0	
Benzo(b)fluoranthene	ND	20.0	
Benzo(k)fluoranthene	ND	20.0	
Benzo(e)pyrene	ND	20.0	
Benzo(a)pyrene	ND	20.0	
Perylene	ND	20.0	
Indeno(1,2,3-c,d)pyrene	ND	20.0	
Dibenz(a,h)anthracene	ND	20.0	
Benzo(g,h,i)perylene	ND	20.0	

	Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
IS	d8-Naphthalene	65.2	50 - 150	
	d8-Acenaphthylene	75.4	50 - 150	
	d10-Acenaphthene	81.4	50 - 150	
	d10-Fluorene	98.9	50 - 150	
	d10-Phenanthrene	104	50 - 150	
	d10-Fluoranthene	96.3	50 - 150	
	d12-Benz(a)anthracene	80.7	50 - 150	
	d12-Chrysene	87.5	50 - 150	
	d12-Benzo(b)fluoranthene	99.3	50 - 150	
	d12-Benzo(k)fluoranthene	100	50 - 150	
	d12-Benzo(a)pyrene	81.1	50 - 150	
	d12-Indeno(1,2,3-c,d)pyrene	95.8	50 - 150	
	d14-Dibenz(a,h)anthracene	99.0	50 - 150	
	d12-Benzo(g,h,i)perylene	92.9	50 - 150	
PS	d14-Terphenyl	96.6	50 - 150	
	d12-Benzo(e)pyrene	95.7	50 - 150	
AS	d10-Anthracene	85.2	50 - 150	

a. Reporting limit.

b. Method detection limit.

c. IS; Internal Standards, PS; Pre-Spike Surrogates.

d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 11-Nov-2005 15:21

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ALTA

Sample ID: W07043-429-F2-R3 **CARB Method 429**

Client Data		Sample Data		Laboratory Data			
Name:	Horizon Air Measurements	Matrix:	MM5	Lab Sample:	26831-006	Date Received:	24-Oct-05
Project:	Simi Valley L.F.	Sample Size:	Sample	QC Batch No.:	7379	Date Extracted:	3-Nov-05
Date Collected:	21-Oct-05			Date Analyzed DB-5:	8-Nov-05		
Time Collected:	NA						

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers
Naphthalene	498	390	B
2-Methylnaphthalene	220	130	B
Acenaphthylene	29.5	20.0	
Acenaphthene	34.5	20.0	
Fluorene	134	20.0	
Phenanthrene	695	50.0	
Anthracene	49.2	20.0	
Fluoranthene	162	20.0	
Pyrene	64.1	20.0	
Benz(a)anthracene	ND	20.0	
Chrysene	ND	20.0	
Benzo(b)fluoranthene	22.4	20.0	
Benzo(k)fluoranthene	ND	20.0	
Benzo(e)pyrene	ND	20.0	
Benzo(a)pyrene	ND	20.0	
Perylene	ND	20.0	
Indeno(1,2,3-c,d)pyrene	ND	20.0	
Dibenz(a,h)anthracene	ND	20.0	
Benzo(g,h,i)perylene	ND	20.0	

	Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
IS	d8-Naphthalene	76.8	50 - 150	
	d8-Acenaphthylene	75.1	50 - 150	
	d10-Acenaphthene	76.1	50 - 150	
	d10-Fluorene	92.0	50 - 150	
	d10-Phenanthrene	108	50 - 150	
	d10-Fluoranthene	85.8	50 - 150	
	d12-Benz(a)anthracene	75.7	50 - 150	
	d12-Chrysene	76.6	50 - 150	
	d12-Benzo(b)fluoranthene	96.5	50 - 150	
	d12-Benzo(k)fluoranthene	103	50 - 150	
	d12-Benzo(a)pyrene	84.1	50 - 150	
	d12-Indeno(1,2,3-c,d)pyrene	91.5	50 - 150	
	d14-Dibenz(a,h)anthracene	93.4	50 - 150	
	d12-Benzo(g,h,i)perylene	88.9	50 - 150	
PS	d14-Terphenyl	95.6	50 - 150	
	d12-Benzo(e)pyrene	91.2	50 - 150	
AS	d10-Anthracene	82.0	50 - 150	

a. Reporting limit.
b. Method detection limit.
c. IS; Internal Standards, PS; Pre-Spike Surrogates.
d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 11-Nov-2005 15:21

ALTA

Sample ID:	W07043-429-FB		CARB Method 429
Client Data		**Sample Data**	
Name:	Horizon Air Measurements	Matrix:	MM5
Project:	Simi Valley L.F.	Sample Size:	Sample
Date Collected:	13-Oct-05		
Time Collected:	NA		

Laboratory Data			
Lab Sample:	26831-007	Date Received:	24-Oct-05
QC Batch No.:	7379	Date Extracted:	3-Nov-05
Date Analyzed DB-5:	8-Nov-05		

Analyte	Conc. (ng/Sample)	RL [a]	Qualifiers
Naphthalene	ND	390	B
2-Methylnaphthalene	ND	130	B
Acenaphthylene	ND	20.0	
Acenaphthene	ND	20.0	
Fluorene	ND	20.0	
Phenanthrene	ND	50.0	
Anthracene	ND	20.0	
Fluoranthene	ND	20.0	
Pyrene	ND	20.0	
Benz(a)anthracene	ND	20.0	
Chrysene	ND	20.0	
Benzo(b)fluoranthene	ND	20.0	
Benzo(k)fluoranthene	ND	20.0	
Benzo(e)pyrene	ND	20.0	
Benzo(a)pyrene	ND	20.0	
Perylene	ND	20.0	
Indeno(1,2,3-c,d)pyrene	ND	20.0	
Dibenz(a,h)anthracene	ND	20.0	
Benzo(g,h,i)perylene	ND	20.0	

	Labeled Standard [c]	%R	LCL-UCL [d]	Qualifiers
IS	d8-Naphthalene	76.1	50 - 150	
	d8-Acenaphthylene	72.7	50 - 150	
	d10-Acenaphthene	72.6	50 - 150	
	d10-Fluorene	75.9	50 - 150	
	d10-Phenanthrene	69.5	50 - 150	
	d10-Fluoranthene	84.4	50 - 150	
	d12-Benz(a)anthracene	80.1	50 - 150	
	d12-Chrysene	87.1	50 - 150	
	d12-Benzo(b)fluoranthene	92.6	50 - 150	
	d12-Benzo(k)fluoranthene	92.4	50 - 150	
	d12-Benzo(a)pyrene	83.8	50 - 150	
	d12-Indeno(1,2,3-c,d)pyrene	95.8	50 - 150	
	d14-Dibenz(a,h)anthracene	96.6	50 - 150	
	d12-Benzo(g,h,i)perylene	92.6	50 - 150	
PS	d14-Terphenyl	103	50 - 150	
	d12-Benzo(e)pyrene	99.7	50 - 150	
AS	d10-Anthracene	73.1	50 - 150	

a. Reporting limit.

b. Method detection limit.

c. IS; Internal Standards, PS; Pre-Spike Surrogates.

d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Martha M. Maier 11-Nov-2005 15:21

APPENDIX

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank.
D	The amount reported is the maximum possible concentration due to possible chlorinated diphenylether interference.
E	The reported value exceeds the calibration range of the instrument.
H	The signal-to-noise ratio is greater than 10:1.
I	Chemical interference
J	The amount detected is below the Lower Calibration Limit of the instrument.
*	See Cover Letter
Conc.	Concentration
DL	Sample-specific estimated Detection Limit
MDL	The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero in the matrix tested.
EMPC	Estimated Maximum Possible Concentration
NA	Not applicable
RL	Reporting Limit – concentrations that corresponds to low calibration point
ND	Not Detected
TEQ	Toxic Equivalency

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

CERTIFICATIONS

Accrediting Authority	Certificate Number
State of Alaska, DEC	CA413-02
State of Arizona	AZ0639
State of Arkansas, DEQ	05-013-0
State of Arkansas, DOH	Reciprocity through CA
State of California – NELAP Primary AA	02102CA
State of Colorado	
State of Connecticut	PH-0182
State of Florida, DEP	E87777
Commonwealth of Kentucky	90063
State of Louisiana, Health and Hospitals	LA050001
State of Louisiana, DEQ	01977
State of Maine	CA0413
State of Michigan	81178087
State of Mississippi	Reciprocity through CA
Naval Facilities Engineering Service Center	
State of Nevada	CA413
State of New Jersey	CA003
State of New Mexico	Reciprocity through CA
State of New York, DOH	11411
State of North Carolina	06700
State of North Dakota, DOH	R-078
State of Oklahoma	D9919
State of Oregon	CA200001-002
State of Pennsylvania	68-00490
State of South Carolina	87002001
State of Tennessee	02996
State of Texas	TX247-2005A
U.S. Army Corps of Engineers	
State of Utah	9169330940
Commonwealth of Virginia	00013
State of Washington	C1285
State of Wisconsin	998036160
State of Wyoming	8TMS-Q

26831 5.6°C 9.2°C 12.5°C

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANALYSES
Simi Valley L.F.	Simi Valley, CA.	CARB Method 429 (PAHs); hexachlorobenzene
Project No. W07-043	Field Logbook No.	
Sampler: (*Signature*) [signature]	Chain of Custody Tape No.	

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	CARB Method 429 (PAHs)	hexachlorobenzene					REMARKS
W07-043-429-F1-R1 C1	10/13/05			Rinse (Probe)	✓	✓					Flare #1 R1
W07-043-429-F1 R1 C2	↓			Filter	✓	✓					↓
W07-043-429 F1 R1 C3				XAD	✓	✓					
W07-043-429-F1 R1 C4				Rinse (back half) ~~Impinger Contents~~	✓	✓					
W07-043-429-F1 R1 C5				Impinger Content	✓	✓					
W07-043-429-F1 R1 C6				Rinse (imp)	✓	✓					

Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
[signature]	10/22/05	1000	[signature]	10/22/05	1000
Relinquished by: (*Signature*) [signature]	10/24/05	1300	Received by: (*Signature*) Bettina J. Benedict	10/24/05	1300
Relinquished by: (*Signature*)	Date	Time	Received for Laboratory: (*Signature*)	Date	Time
Sample Disposal Method:			Disposed of by: (*Signature*)	Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Nº 8451

169

CHAIN OF CUSTODY RECORD

26831 5.6°C 9.2°C 12.5°C

Client/Project Name	Project Location
Simi Valley L.F.	Simi Valley, CA.

Project No.	Field Logbook No.
107-043	

Sampler: (Signature)	Chain of Custody Tape No.
T. Williams	

ANALYSES: PM429 CARB METHOD 429 (PAH'S) HEXACHLOROBENZENE

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample							REMARKS
N07043-429-F1-R2-C1	10/14/05			Rinse (PROBE)	✓	✓					Plant #1 Run #2
N07043-429-F1-R2-C2				Filter	✓	✓					
N07043-429-F1-R2-C3				XAD	✓	✓					
N07043-429-F1-R2-C4				Rinse (Back half)	✓	✓					
N07043-429-F1-R2-C5				Impinger Contents	✓	✓					
N07043-429-F1-R2-C6				Rinse (impingers)	✓	✓					

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
T. Williams	10/22/05	1000		10/22/05	1000
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	10/24/05	1300	Bettina A. Benedict	10/24/05	1300
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Nº 8449

CHAIN OF CUSTODY RECORD

2683 | 5.6°C 9.2°C 12.5°C

Client/Project Name	Project Location
Simi Valley L.F.	Simi Valley, CA
Project No.	**Field Logbook No.**
W07-043	
Sampler: (Signature)	**Chain of Custody Tape No.**
T. Williams	

ANALYSES: ARB METHOD 429 (CARB 429 (DATS)); HEXACHLOROBENZENE

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample			REMARKS
W07043-429-F1-R3-C1	10/17/05			Rinse (Probe)	✓	✓	Flare #1 Run #3
07-043-429-F1-R3-C2	↓			Filter	✓	✓	
07043-429-F1-R3-C3				XAD	✓	✓	
W07043-429-F1-R3-C4				Rinse (back half)	✓	✓	
W07-043-429-F1-R3-C5				Impinger Contents	✓	✓	
W07043 429-F1 R3 C6				Rinse (impingers)	✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
T. Williams	10/21/05	1000	[signature]	10/21/05	1000
[signature] LC	10/24/05	1300	Bettina A. Benedict	10/24/05	1300
Relinquished by: (Signature)	**Date**	**Time**	**Received for Laboratory: (Signature)**	**Date**	**Time**

Sample Disposal Method:	Disposed of by: (Signature)	Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Nº 8399

CHAIN OF CUSTODY RECORD

26831

5.6°C
9.2°C
12.5°C

Client/Project Name	Project Location
Simi Valley L.F.	Simi Valley, CA
Project No.	**Field Logbook No.**
407-043	
Sampler: (Signature)	**Chain of Custody Tape No.**
T. Williams	

ANALYSES: Method 429 CARB (Phase 3) HEXACHLOROBENZENE

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample			REMARKS
407043-429-F2 R1C1	10/19/05			Rinse (Probe)	✓	✓	Flare 2 R-1
407043-429-F2 R1C2				Filter	✓	✓	Flare 2 R1
407043-429-F2-R1C3				XAD	✓	✓	
407043-429-F2-R1C4				Rinse (Back half)	✓	✓	
407043-429-F2-R1C5				Impinger Content	✓	✓	
407043-429-F2-R1C6				Rinse (Imp)	✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
T. Williams	10/22/05	1000	[signature]	10/22/05	1000
[signature]	10/24/05	1300	Bettina A. Benedict	10/24/05	1300
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Nº 8467

CHAIN OF CUSTODY RECORD

26831

5.6°C
9.2°C
12.5°C

Client/Project Name	Project Location
Simi Valley LF	Simi Valley, CA

Project No.	Field Logbook No.
W07-0413	

Sampler: (*Signature*)	Chain of Custody Tape No.

ANALYSES: 429 CARB METHOD (PAH's) + HEXACHLOROBENZENE

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample							REMARKS
W0704 13-429 F2 R2 C1	10/20/05			Rinse (Probe)	✓	✓					Flare 2 R2
W07-0413 429 F2 R2C2				Filter	✓	✓					
W07-0413 429 F2 R2C3				XAD	✓	✓					
W07-0413 429-F2-R2C4				Rinse (Back half)	✓	✓					
W0704 13 429-F2-R2C5				Impinger Content	✓	✓					
W07-0413 429-F2-R2C6				Rinse (Imp)	✓	✓					

Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
	10/22/05	1000		10/22/05	1000
Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
	10/24/05	1300	Bettina P. Benedict	10/24/05	1300
Relinquished by: (*Signature*)	Date	Time	Received for Laboratory: (*Signature*)	Date	Time
Sample Disposal Method:	Disposed of by: (*Signature*)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

No 8473

1-13

CHAIN OF CUSTODY RECORD

26831 5.6°C 9.2°C 12.5°C

Client/Project Name	Project Location
Simi Valley L.F	Simi Valley Ca

Project No.	Field Logbook No.
WO7-043	

Sampler: (*Signature*)	Chain of Custody Tape No.

ANALYSES: Method 429 (CARB) (DAIS) HEXACHLOROBENZENE

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample			REMARKS
043-429-F2-R3-C1	10/21/05			Rinse (Probe)	✓	✓	Flare 2 R-3
-R3-C2				Filter	✓	✓	
-R3-C3				XAD	✓	✓	
-R3-C4				Rinse (Back-half)	✓	✓	
-R3-C5				Impinger Content	✓	✓	
-R3-C6				Rinse (Impinger)	✓	✓	

Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
	10/24/05	1000		10/24/05	1000
Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
	10/24/05	1300	Bettina L. Benedict	10/24/05	1300
Relinquished by: (*Signature*)	Date	Time	Received for Laboratory: (*Signature*)	Date	Time
Sample Disposal Method:	Disposed of by: (*Signature*)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Nº 8477

CHAIN OF CUSTODY RECORD

26831

5.6°C
9.2°C
12.5°C

Client/Project Name	Project Location
Simi Valley, CA	S.V., CA.
Project No.	**Field Logbook No.**
WO7-043	
Sampler: (Signature)	**Chain of Custody Tape No.**
T. Winn	

ANALYSES: Impact Cars Method 429 (PAH's) Hexachlorobenzene

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample			REMARKS
WO7043-429-FB-C1	10/13/05			Rinse (Probe)	✓	✓	Field Blank
WO7-043-429-FBC2				Filter	✓	✓	
WO7-043-429-FB-C3				XAD	✓	✓	
WO7-043-429-FBC4				Rinse (Back half)	✓	✓	
WO7-043-429-FBC5				Impinger Content	✓	✓	
WO7-043-429-FBC6				Rinse (Imp)	✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
T. Winn	10/20/05	1000		10/20/05	1000
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	10/21/05	1300	Bettina C. Benedict	10/24/05	1300
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Nº 8450

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CHAIN OF CUSTODY RECORD

26831 5.6°C 9.2°C 12.5°C

Client/Project Name	Project Location
Simi Valley L.F.	S.V., CA.
Project No.	**Field Logbook No.**
W07-043	
Sampler: (*Signature*)	**Chain of Custody Tape No.**

ANALYSES: MWAA CARB 429 METHOD (BTEX) / HEXACHLOROBENZENE

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample			REMARKS
W07043429 SB-1	10/13/05			Acetone 250mL	X	X	Solution Blanks
W07043-429 SB-2				MeCl2 250mL	X	X	
W07043 429 SB-3				Hexane 250mL	X	X	
W07043-429 SB-4				DNH Solution 250mL	X	X	

Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
	10/22/05	1000		10/22/05	1000
Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
	10/24/05	1300	Bettina J. Benedict	10/24/05	1300
Relinquished by: (*Signature*)	Date	Time	Received for Laboratory: (*Signature*)	Date	Time
Sample Disposal Method:	Disposed of by: (*Signature*)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Nº 8307

ORSAT DATA SHEET
METHOD 3

Client: Waste Management **Project #:** W07.043

Facility: Simi Valley **Date:** 10.27.05

Source: Flare #2 **Analyzed by:**

Run #: W07.043.F2.M3.429.R1
(10.19.05)

Gas \ Run	1		2		3		Average Net Volume
	Actual Reading	Net	Actual Reading	Net	Actual Reading	Net	
CO_2	7.1		7.1		7.1		7.1
O_2 (Net is Actual O_2 minus Actual CO_2 Reading)	20.6	13.5	20.6	13.5	20.6	13.5	13.5
CO (Net is Actual CO minus Actual O_2 reading)							
N_2 (Net is 100 minus Acutal CO reading)							

ORSAT DATA SHEET
METHOD 3

Client: Waste Management
Facility: Simi Valley
Source: Flare #2
Run #: W07.043.F2.M3.429.R2 (10.20.05)

Project #: W07.043.1
Date: 10.27.05
Analyzed by: [signature]

Gas \ Run	1		2		3		Average Net Volume
	Actual Reading	Net	Actual Reading	Net	Actual Reading	Net	
CO_2	6.6		6.6		6.6		6.6
O_2 (Net is Actual O_2 minus Actual CO_2 Reading)	20.5	13.9	20.5	13.9	20.5	13.9	13.9
CO (Net is Actual CO minus Actual O_2 reading)							
N_2 (Net is 100 minus Acutal CO reading)							

ORSAT DATA SHEET
METHOD 3

Client: Waste Management **Project #:** W07043

Facility: Simi Valley **Date:** 10.27.05

Source: Flare #2 **Analyzed by:**

Run #: W07043-F2-M3-425-R3 (10-21-05)

Gas \ Run	1		2		3		Average Net Volume
	Actual Reading	Net	Actual Reading	Net	Actual Reading	Net	
CO_2	6.3		6.3		6.3		6.3
O_2 (Net is Actual O_2 minus Actual CO_2 Reading)	21.0	14.7	21.0	14.7	21.0	14.7	14.7
CO (Net is Actual CO minus Actual O_2 reading)							
N_2 (Net is 100 minus Acutal CO reading)							

ORSAT DATA SHEET
METHOD 3

Client: Waste Management **Project #:** W07.043

Facility: Simi Valley **Date:** 10.27.05

Source: Flare 2 **Analyzed by:**

Run #: W07.043.F2.M3.425.R1
10.19.05

Gas \ Run	1		2		3		Average Net Volume
	Actual Reading	Net	Actual Reading	Net	Actual Reading	Net	
CO_2	7.3		7.3		7.3		7.3
O_2 (Net is Actual O_2 minus Actual CO_2 Reading)	20.7	13.4	20.7	13.4	20.7	13.4	13.4
CO (Net is Actual CO minus Actual O_2 reading)							
N_2 (Net is 100 minus Acutal CO reading)							

ORSAT DATA SHEET
METHOD 3

Client: Waste Management **Project #:** W07.043

Facility: Simi Valley **Date:** 10.27.05

Source: Flare #2 **Analyzed by:**

Run #: W07.043.F2.M3.425.R2 (10.20.05)

Gas \ Run	1		2		3		Average Net Volume
	Actual Reading	Net	Actual Reading	Net	Actual Reading	Net	
CO_2	7.1		7.1		7.1		7.1
O_2 (Net is Actual O_2 minus Actual CO_2 Reading)	20.5	13.4	20.5	13.4	20.5	13.4	13.4
CO (Net is Actual CO minus Actual O_2 reading)							
N_2 (Net is 100 minus Acutal CO reading)							

ORSAT DATA SHEET
METHOD 3

Client: Waste Management **Project #:** W07.043

Facility: Simi Valley **Date:** 10.27.05

Source: Flare #2 **Analyzed by:**

Run #: W07043 F2-M3-430 R3

10.21.05

Run / Gas	1		2		3		Average Net Volume
	Actual Reading	Net	Actual Reading	Net	Actual Reading	Net	
CO_2	6.1		6.1		6.1		6.1
O_2 (Net is Actual O_2 minus Actual CO_2 Reading)	21.1	15.0	21.1	15.0	21.1	15.0	15.0
CO (Net is Actual CO minus Actual O_2 reading)							
N_2 (Net is 100 minus Acutal CO reading)							

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
SVLF	Simi Valley, CA
Project No.	**Field Logbook No.**
W07-043	
Sampler: (*Signature*)	**Chain of Custody Tape No.**

ANALYSES: CO2 N2O

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample							REMARKS
0704 F2M3 425 R3	10/21/05				X						
0704 43 F2M3 430 R3	10/21/05				X						

Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
	10/25/05	0700		10.25.05	0700
Relinquished by: (*Signature*)	**Date**	**Time**	**Received by: (*Signature*)**	**Date**	**Time**
Relinquished by: (*Signature*)	**Date**	**Time**	**Received for Laboratory: (*Signature*)**	**Date**	**Time**
Sample Disposal Method:	**Disposed of by: (*Signature*)**			**Date**	**Time**

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

HAMS

Nº 8440

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
SVLF	Simi Valley CA
Project No.	**Field Logbook No.**
W07-043	
Sampler: (Signature)	**Chain of Custody Tape No.**

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	ANALYSES: M3 CO2	REMARKS
W07043 F2M3 429 R1	10/19/05			BAG	X	
W07043 F2M3 425 R1	10/19/05				X	
W07043 F2M3 429 R2	10/20/05				X	
W07-043 F2M3 425 R2	10/20/05				X	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	10/25/05	0700		10.25.05	0700
Relinquished by: (Signature)	**Date**	**Time**	**Received by: (Signature)**	**Date**	**Time**
Relinquished by: (Signature)	**Date**	**Time**	**Received for Laboratory: (Signature)**	**Date**	**Time**
Sample Disposal Method:	**Disposed of by: (Signature)**			**Date**	**Time**

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

HAMS

Nº 8437

ORSAT DATA SHEET
METHOD 3

Client: CURTIS TOMPKINS LAB **Project #:** C58.001

Facility: SIMI VALLEY L.F. **Date:** 11.22.05

Source: FLARE #2 **Analyzed by:**

Run #: C58001.F2.M3.R1

Gas \ Run	1		2		3		Average Net Volume
	Actual Reading	Net	Actual Reading	Net	Actual Reading	Net	
CO_2	6.0		6.0		6.0		6.0
O_2 (Net is Actual O_2 minus Actual CO_2 Reading)	20.5	14.5	20.5	14.5	20.5	14.5	14.5
CO (Net is Actual CO minus Actual O_2 reading)							
N_2 (Net is 100 minus Acutal CO reading)							

ORSAT DATA SHEET
METHOD 3

Client: CURTIS TOMPKINS **Project #:** C58.001

Facility: SIMI VALLEY L.F. **Date:** 11.22.05

Source: FLARE #2 **Analyzed by:** [signature]

Run #: C58001.F2.M3.R2

Gas \ Run	1		2		3		Average Net Volume
	Actual Reading	Net	Actual Reading	Net	Actual Reading	Net	
CO_2	8.9		8.9		8.9		8.9
O_2 (Net is Actual O_2 minus Actual CO_2 Reading)	20.3	11.4	20.3	11.4	20.3	11.4	11.4
CO (Net is Actual CO minus Actual O_2 reading)							
N_2 (Net is 100 minus Acutal CO reading)							

ORSAT DATA SHEET
METHOD 3

Client: WASTE MANAGEMENT **Project #:** W07.043/C58.001

Facility: SIMI VALLEY L.F. **Date:** 11.22.05

Source: FLARE #2 **Analyzed by:**

Run #: Flare2.R3.TB1

Gas \ Run	1		2		3		Average Net Volume
	Actual Reading	Net	Actual Reading	Net	Actual Reading	Net	
CO_2	6.0		6.0		6.0		6.0
O_2 (Net is Actual O_2 minus Actual CO_2 Reading)	20.8	14.8	20.8	14.8	20.8	14.8	14.8
CO (Net is Actual CO minus Actual O_2 reading)							
N_2 (Net is 100 minus Acutal CO reading)							

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANALYSES
Curtis Tompkins LAB	Simi Valley LF, CA	
Project No. C58-001	**Field Logbook No.**	
Sampler: (*Signature*)	**Chain of Custody Tape No.**	

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	Method #3 CO2	REMARKS
5800 1F2M3R1	11/21/05			5 L bag	X	Run #1 F-2
5800 1F2M3R2	11/21/05					Run #2 F-2

Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
	11/22/05	0700			
Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
Relinquished by: (*Signature*)	Date	Time	Received for Laboratory: (*Signature*)	Date	Time
				11/22/05	0700
Sample Disposal Method:	Disposed of by: (*Signature*)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

HAMS

Nº 8798

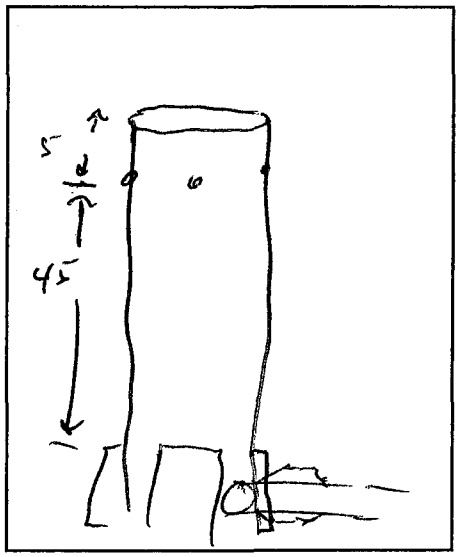
APPENDIX D - Field Data Sheets

VELOCITY DATA SHEET - METHOD 2

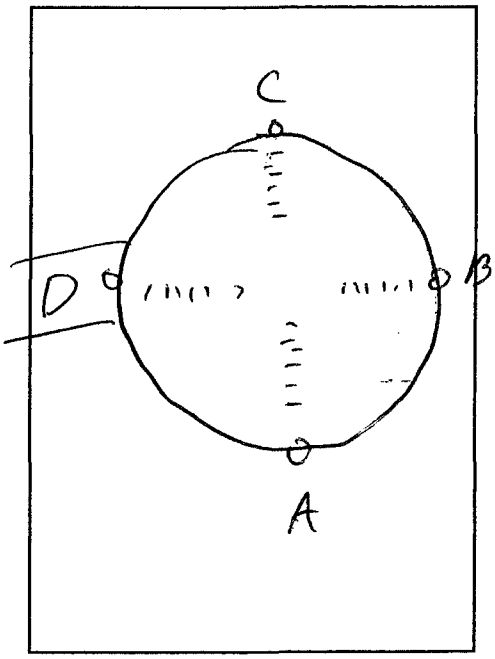
Facility:	Sim. Valley LF	**Baro. Press:**	28.82	**D_1 upstream:**	0.76
Source:	Flare 2 J. Zinc	**Static Press:**	-0.005	**D_1 downstream:**	4.1
Job #:	w07-043	**Pitot Tube #:**	10-Inc	**Stack Diameter:**	128
Date:	10/18/05	**Pitot Tube Type:**	S	**Leak Check**	
Operator:	EA/TW	**Magnahelic:**	Man	**Initial:**	**Final:**
Run #:	Pre			✓/✓	✓/✓

Point #	Position in.	Velocity Head in. H_2O	Stack Temp °F	Cyclonic Flow Angle
A-6	46.8	0.015	1578	0
5	33.6	0.015	1562	0
4	22.8	0.015	1555	0
3	15.6	0.015	1581	0
2	8.4	0.015	1588	0
1	2.4	0.015	1575	0
6		0.015	1541	0
5		0.015	1564	0
4		0.015	1564	0
3		0.015	1577	0
2		0.015	1521	0
1		0.015	1528	0
6		0.015	1577	0
5		0.015	1581	0
4		0.015	1572	0
3		0.015	1569	0
2		0.015	1543	0
1		0.015	1540	0
6		0.015	1562	0
5		0.015	1569	0
4		0.015	1572	0
3		0.015	1545	0
2		0.015	1541	0
1		0.015	1537	0
Average		**√ΔP=**	**T_s=**	**∠=**

Side View



Top View

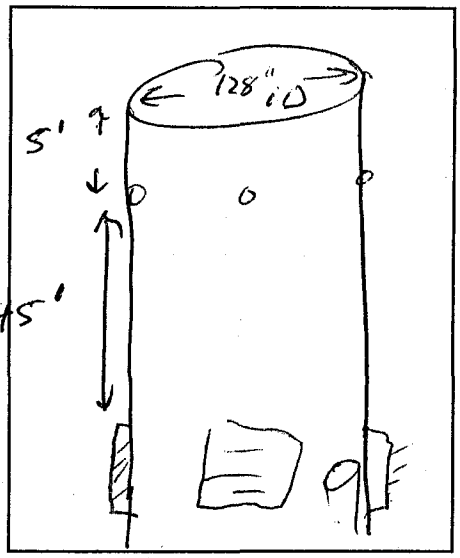


VELOCITY DATA SHEET - METHOD 2

Facility:	Sim. Valley	**Baro. Press:**	28.60	**D_1 upstream:**	4.6
Source:	John Zinc Flare	**Static Press:**	-0.005	**D_1 downstream:**	4.1
Job #:	W07-043	**Pitot Tube #:**	- 10" inc	**Stack Diameter:**	128
Date:	10/12/05	**Pitot Tube Type:**	S	**Leak Check**	
Operator:	CL	**Magnahelic:**	man	**Initial:**	**Final:**
Run #:	pre			v/c	-/c

Point #	Position in.	Velocity Head in. H_2O	Stack Temp °F	Cyclonic Flow Angle
A - 6	46.8	0.020	1677	~~0~~
5	33.6	0.020	1692	~~0~~
4	22.8	0.020	1647	~~0~~
3	15.6	0.015	1665	~~0~~
2	8.4	0.015	1644	~~0~~
1	2.4	0.015	1615	~~0~~
B - 6		0.020	1636	~~0~~
5		0.020	1655	~~0~~
4		0.015	1678	~~0~~
3		0.015	1652	~~0~~
2		0.015	1657	~~0~~
1		0.015	1644	~~0~~
C - 6		0.020	1638	~~0~~
5		0.020	1667	~~0~~
4		0.020	1676	~~0~~
3		0.021	1677	~~0~~
2		0.015	1636	~~0~~
1		0.015	1644	~~0~~
D - 6		0.020	1666	~~0~~
5		0.020	1654	~~0~~
4		0.020	1649	~~0~~
3		0.015	1663	~~0~~
2		0.015	1645	~~0~~
1		0.015	1642	~~0~~
Average		**$\sqrt{\Delta P}$=**	**T_s=**	**∠=**

Side View



Top View

PARTICULATE FIELD DATA

PLANT Simi Valley
DATE ~~10/11~~ 10/12/02
LOCATION Simi Valley
OPERATOR EL
SOURCE Flare 2 John Zinc
RUN NO. M436 MM R1
SAMPLE BOX NO. C-11

TIME START 0822

METER BOX NO. 7
METER ΔH @ 1.5672
Y= 0.9856
PROBE I.D. NO. CQ5
NOZZLE DIAMETER, in. 1.010
STACK DIAMETER, in. 128"
PROBE HEATER SETTING ~~250~~ EL
HEATER BOX SETTING 250
Δ Cp FACTOR 0.84
FILTER NO. Q5011

ASSUMED MOISTURE, % 10%
AMBIENT TEMPERATURE 68
BARO. PRESS. 28.60
STATIC PRESS. -0.0205
NOMAGRAPH INDEX ~~220~~ 220 EL

PRE TEST LEAK CHECKS
METER 0.013 @ 15 in. Hg
PITOTS ~~0~~ @ 3 /3 in. Hg
ORSAT

P#	TIME	T_s °F	ΔP in H_2O	√ΔP	ΔH in H_2O	Vm ft^3	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
~~A12~~	0	1610	0.015		3.3	620.330	60	58	256	50	4
5	3.75	1635	0.015		3.3	624.3	65	58	255	48	4
4	7.5	1644	0.015		3.3	628.8	69	58	258	48	4
3	11.25	1632	0.015		3.3	633.1	74	61	257	48	4
2	15.0	1646	0.020		4.4	636.9	76	63	253	48	4
1	18.75	1639	0.020		4.4	642.2	79	65	254	48	4
~~6~~	22.5	1671	0.020		4.4	646.200	77	66	255	50	4
5	26.25	1659	0.020		4.4	651.0	83	69	254	50	4
4	30	1644	0.020		4.4	655.9	84	70	265	50	4
3	33.75	1672	0.015		3.3	660.1	85	71	262	48	4
2	37.5	1654	0.015		3.3	664.1	85	72	263	48	4
1	41.25	1682	0.015		3.3	668.2	85	73	265	48	4
~~612~~	45	1642	0.015		3.3	672.377	81	80	262	48	4
5	48.75	1572	0.015		3.3	675.8	83	80	262	48	4
4	52.5	1532	0.020		4.4	679.9	88	80	258	49	4
3	56.25	1528	0.015		3.3	684.7	88	80	252	48	4
2	60	1501	0.020		4.4	689.1	91	81	259	48	4
1	63.75	1579	0.020		4.4	693.4	92	82	260	47	4
~~6~~	67.5	1678	0.020		4.4	698.254	90	83	258	47	4
5	71.25	1592	0.020		4.4	703.0	90	84	260	49	4
4	75	1624	0.015		3.3	707.8	91	85	258	48	4
3	78.75	~~1547~~ 1547	0.015		3.3	711.8	94	85	255	48	4
2	82.5	1571	0.015		3.3	716.0	86	95	256	48	4
1	86.25	1592	0.015		3.3	719.8	96	88	255	48	4
	90					723.960					
Avg.		1614		0.1346	3.76	103.630		78.7			

TIME END = 1125

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
~~Initial~~ ~~Final~~	100 / 100	0 / 100	100 /		276
Final ~~Initial~~	~~222~~ / 128	~~212~~ / 106	~~102~~ 102 /		250
Liquid Collected	222 / 128	6 / 106	96 /		26
Total Vol. Collected	~~122~~ / 28	6 / 6	-4 /		
					184

POST TEST LEAK CHECKS
Meter 0.010 @ 15 in. Hg
Pitots ~~0~~ @ 3 /3 in. Hg
Orsat

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average
				192

PARTICULATE FIELD DATA

PLANT Simi LandFill
DATE 10/12/05
LOCATION Simi Valley
OPERATOR CI
SOURCE Flare 2 John Zink
RUN NO. M436 R-2
SAMPLE BOX NO. C-5
TIME START 1204

METER BOX NO. 7
METER ΔH @ 1.5672
Y= 0.9856
PROBE I.D. NO. CQS
NOZZLE DIAMETER, in. 1.010
STACK DIAMETER, in. 128 "
PROBE HEATER SETTING
HEATER BOX SETTING 250
Δ Cp FACTOR .84
FILTER NO. Q5010

ASSUMED MOISTURE, % 10 %
AMBIENT TEMPERATURE 82
BARO. PRESS. 28.60
STATIC PRESS. -0.005
NOMAGRAPH INDEX 220

PRE TEST LEAK CHECKS
METER 0.009 @ 15 in. Hg
PITOTS Ø Ø @ 3/3 in. Hg
ORSAT

P#	TIME	T_s °F	ΔP in H_2O	√ΔP	ΔH in H_2O	Vm ft^3	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
D-6	0	1623	0.020		4.4	727.210	88	88	251	54	4
5	3.75	1601	0.020		4.4	732.[illegible]	90	88	255	50	4
4	7.5	1634	0.020		4.4	736.8	92	88	256	50	4
3	11.25	1591	0.015		3.3	741.3	95	89	254	48	4
2	15.0	1602	0.015		3.3	746.0	97	90	252	48	4
1	18.75	1575	0.015		3.3	750.0	98	91	256	48	4
C 6	22.5	1522	0.020		4.4	753.748	90	90	248	48	4
5	26.25	1630	0.020		4.4	759.0	91	90	258	47	4
4	30	1656	0.015	3.3	4.4	763.3	91	90	258	47	4
3	33.75	1597	0.015		3.3	767.2	92	90	256	47	4
2	37.5	1642	0.015		3.3	772.0	92	90	255	47	4
1	41.25	1584	0.015		3.3	776.7	93	90	255	47	4
B 6	45	1641	0.020		4.4	780.872	90	89	251	47	4
5	48.75	1652	0.020		4.4	785.4	93	90	255	48	4
4	52.5	1678	0.015		3.3	789.7	95	90	256	48	4
3	56.25	1700	0.020		4.4	794.3	96	90	259	48	4
2	60	1654	0.015		3.3	798.3	97	90	257	48	4
1	63.75	1698	0.015		3.3	802.2	97	91	256	48	4
A 6	67.5	1643	0.020		4.4	806.511	93	90	255	49	4
5	71.25	1679	0.020		4.4	810.4	94	90	258	49	4
4	75	1648	0.020		4.4	815.0	95	91	260	48	4
3	78.75	1682	0.015		3.3	820.5	95	91	262	48	4
2	82.5	1676	0.015		3.3	824.5	95	91	257	48	4
1	86.25	1654	0.015		3.3	828.6	96	91	254	48	4
	90					832.645					
Avg.		1636.3		0.1312	3.80	105.435		91.7			

TIME END = 1402

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
~~INITIAL~~ / ~~Final~~	100 / 100	0 / 100	100		271
~~Final~~ / ~~Initial~~	233 / 137	7 / 102	102		250
Liquid Collected	133 / 37	7 / 2	2		21
Total Vol. Collected					292

POST TEST LEAK CHECKS
Meter 0.010 @ 15 in. Hg
Pitots Ø Ø @ 3/3 in. Hg
Orsat

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average
				193

PARTICULATE FIELD DATA

PLANT Simi Landfill
DATE ~~10/12/05~~ 10/13/05
LOCATION Simi Valley
OPERATOR EI
SOURCE Flare 2 John Zink
RUN NO. R-3 M436
SAMPLE BOX NO. C-11
TIME START 942

METER BOX NO. 7
METER ΔH@ 1.5672
Y= 0.9856
PROBE I.D. NO. ~~C&S~~ CI
NOZZLE DIAMETER, in. ~~1.010~~ 1.0537
STACK DIAMETER, in. 128"
PROBE HEATER SETTING
HEATER BOX SETTING 250
Δ Cp FACTOR 0.84
FILTER NO. Q5013

ASSUMED MOISTURE, % 10 %
AMBIENT TEMPERATURE ~~50~~ CI
BARO. PRESS. ~~28.60~~ EI 28.7
STATIC PRESS. -0.903"
NOMAGRAPH INDEX ~~220~~ 250

PRE TEST LEAK CHECKS
METER 0.004 @ 15 in. Hg
PITOTS ✓ ✓ @ 3/3 in. Hg
ORSAT

P#	TIME	T_s °F	ΔP in H_2O 0.020	√ΔP	ΔH in H_2O 5.0	Vm ft^3	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A-C	0	1694	~~0.020~~ CI	CI	~~4.4~~	834.676	88	86	254	52	5
5	3.75	1677	0.020		5.0	839.7	89	86	249	50	5
4	7.5	1698	0.020		5.0	844.7	93	87	249	48	5
3	11.25	1726	0.015		3.8	850.0	95	88	256	48	4
2	15.0	1712	0.015		3.8	853.8	96	89	255	48	4
1	18.75	1703	0.015		3.8	858.4	98	91	254	48	4
B C	22.5	1677	0.020		5.0	862.260	95	91	252	52	4
5	26.25	1654	0.020		5.0	867.0	99	92	254	50	4
4	30	1712	0.020		5.0	871.9	100	92	255	48	4
3	33.75	1726	0.015		3.8	876.9	100	93	254	48	4
2	37.5	1708	0.015		3.8	881.5	101	94	252	48	4
1	41.25	1665	0.015		3.8	885.8	101	95	256	48	4
C 6	45	1674	0.020		5.0	890.237	95	95	254	49	4
5	48.75	1657	0.020		5.0	895.3	100	96	255	48	4
4	52.5	1685	0.020		5.0	899.7	102	96	256	48	4
3	56.25	1695	0.015		3.8	904.9	103	97	258	48	4
2	60	1701	0.015		3.8	909.8	103	98	255	48	4
1	63.75	1675	0.015		3.8	914.2	104	98	254	48	4
D 6	67.5	1685	0.020		5.0	918.975	100	98	257	48	4
5	~~71.25~~ 69	1695	0.020		5.0	924.9	104	99	257	48	4
4	75	1687	0.020		5.0	928.9	105	100	255	48	4
3	78.75	1671	0.015		3.8	933.2	105	100	258	48	4
2	82.5	1708	0.015		3.8	938.0	106	101	254	48	4
1	86.25	1691	0.015		3.8	942.1	106	101	255	48	4
	90					946.477					
Avg.		1690.8	0.1323		4.40	111.801		96.9			

TIME END = 1142

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	268 / 126	10 / 107	96		261
Initial	100 / 100	0 / 100	100		251
Liquid Collected	168 / 26	10 / 7	-4		30
Total Vol. Collected					237

POST TEST LEAK CHECKS
Meter 0.012 @ 15 in. Hg
Pitots ✓ ✓ @ 3/4 in. Hg
Orsat

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average
				1.01

TOTAL COMBUSTION ANALYSIS
EPA METHOD 25
FIELD SAMPLING DATA SHEET

Job #: W07-043
Facility: Simi LF
Location: Simi Valley Ca
Date: 10/12/05
Operator: ES

Control Device: Flare John Zink
Sample Location: inlet
Ambient Temp.: 70
Baro. Pressure: 28.60

R-1
~~SAMPLE A~~

Tank #: H **Trap #:** NA
Initial Vacuum: _____
Final Vacuum: _____

R-2
~~SAMPLE B~~

Tank #: B **Trap #:** NA
Initial Vacuum: _____
Final Vacuum: _____

Start Time:

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	100
05	28.5	
10	27	
15	25.5	
20	24	
25	22.5	
30	21	
35	19.5	
40	18	
45	16.5	
50	15	
55	13.5	
60	12	

End Time:

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	100
05	28.5	
10	27	
15	25.5	
20	24	
25	22.5	
30	21	
35	19.5	
40	18	
45	16.5	
50	15	
55	13.5	
60	12	

LEAK RATE

Pre Test : ✓ / ✓
Post Test: ✓ / ✓

TOTAL COMBUSTION ANALYSIS
EPA METHOD 25
FIELD SAMPLING DATA SHEET

Job #: W07-043
Facility: Simi LF
Location: Simi Valley Ca
Date: ~~10/12/05~~ 10/13/05
Operator: CL

Control Device: Flare @ John Zink
Sample Location: inlet
Ambient Temp.: 79
Baro. Pressure: 28.60

R-3

~~SAMPLE A~~

Tank #: ~~2~~ N **Trap #:** NA
Initial Vacuum: _____
Final Vacuum: _____

SAMPLE B

Tank #: _____ **Trap #:** NA
Initial Vacuum: _____
Final Vacuum: _____

Start Time:

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	
05	28.5	
10	27	
15	25.5	
20	24	
25	22.5	
30	21	
35	19.5	
40	18	
45	16.5	
50	15	
55	13.5	
60	12	

End Time:

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00		
05		
10		
15		
20		
25		
30		
35		
40		
45		
50		
55		
60		

LEAK RATE

Pre Test : ✓
Post Test: ✓

TOTAL COMBUSTION ANALYSIS
EPA METHOD 25
FIELD SAMPLING DATA SHEET

Job #: W7-043
Facility: Simi Valley L.F.
Location: Simi Valley, C.A.
Date: 10/12/05
Operator: MB

Control Device: Flare #2
Sample Location: OUTLET
Ambient Temp.: 55°F
Baro. Pressure: 28.60

SAMPLE A R1

Tank #: 814 **Trap #:** NA
Initial Vacuum: 30 " / 1.0 bore
Final Vacuum: 8.0"

Start Time:

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	
05	28	
10	26	
15	24.5	
20	23	
25	21	
30	19	
35	17	
40	15	
45	13	
50	11	
55	9.5	
60	8	

SAMPLE B R2

Tank #: ~~821~~ TV **Trap #:** NA
Initial Vacuum: 30 " / 1.0 bore
Final Vacuum: 10"

End Time:

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	
05	28.5	
10	27	
15	25.5	
20	24	
25	22.5	
30	21	
35	19.5	
40	18	
45	16	
50	14	
55	12	
60	10	

LEAK RATE

Pre Test : ✓✓ TV
Post Test: ✓✓ TV

TOTAL COMBUSTION ANALYSIS
EPA METHOD 25
FIELD SAMPLING DATA SHEET

Job #: W07-043
Facility: Simi Valley, CA™ L.F.
Location: Simi Valley, CA
Date: 10/13/05
Operator: MB

Control Device: Flare #2
Sample Location: OUTLET
Ambient Temp.: 65°F
Baro. Pressure: 28.60

SAMPLE A R3

Tank #: S 21 **Trap #:** NA
Initial Vacuum: 30 " / tare
Final Vacuum: 10 "

SAMPLE B

Tank #: _____ **Trap #:** NA
Initial Vacuum: _____
Final Vacuum: _____

Start Time:

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	
05	28.5	
10	27	
15	25	
20	23.5	
25	22	
30	20.5	
35	19	
40	17.5	
45	16	
50	14	
55	12	
60	10	

End Time:

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	X	
05		
10		
15		
20		
25		
30		
35		
40		
45		
50		
55		
60		

LEAK RATE

Pre Test : ✓ pv
Post Test: ✓ pv

PARTICULATE FIELD DATA

PLANT Simi Valley Landfill
DATE 10/19/05
LOCATION Simi Valley
OPERATOR EI
SOURCE Flare 2 Inlet
RUN NO. 1 M421 HCL
SAMPLE BOX NO. C-7
TIME START 0840

METER BOX NO. 4
METER ΔH@ 1.7037
Y= 0.9903
PROBE I.D. NO. -
NOZZLE DIAMETER, in. -
STACK DIAMETER, in. -
PROBE HEATER SETTING -
HEATER BOX SETTING -
Δ Cp FACTOR -
FILTER NO. -

ASSUMED MOISTURE, % -
AMBIENT TEMPERATURE 57
BARO. PRESS. 29.22
STATIC PRESS. -
NOMAGRAPH INDEX -

PRE TEST LEAK CHECKS
METER 0.002 @ 15 in. Hg
PITOTS ~~0.0~~ @ - in. Hg
ORSAT -

P#	TIME	T_s °F	Δ P in H_2O	√Δ P	Δ H in H_2O	Vm ft^3	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
Simple	0				3.0	532.370	58	52		56	5
	10				3.0	543.4	80	57		50	5
	20				3.0	550.6	81	58		48	5
	30				3.0	560.7	81	62		47	5
	40				3.0	570.7	81	62		48	5
	50				3.0	580.7	81	63		49	5
	60					591.064					
Avg.					3.00	58.694		68.0			

TIME END = 940

SB SB SB

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	185	115	2		263
Initial	100	100	0		250
Liquid Collected	85	15	2		13
Total Vol. Collected					115

SB

POST TEST LEAK CHECKS
Meter 0.000 @ 15 in. Hg
Pitots - @ - in. Hg
Orsat -

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average
				19

PARTICULATE FIELD DATA

PLANT ~~City of Vernon~~ Simi Valley Ca
DATE 10/19/05
LOCATION ~~Vernon, CA~~ Simi Ca
OPERATOR EI
SOURCE ~~CTG~~ Flare 2 Zone
RUN NO. 2 M421 HCL
SAMPLE BOX NO. C-10

TIME START 1245

METER BOX NO. 4
METER ΔH@ 1.7037
Y= 0.9953
PROBE I.D. NO. —
NOZZLE DIAMETER, in. —
STACK DIAMETER, in. 128
PROBE HEATER SETTING ~~NA~~
HEATER BOX SETTING ~~NA~~
Δ Cp FACTOR 0.84
FILTER NO. ~~NA~~

ASSUMED MOISTURE, % —
AMBIENT TEMPERATURE 68
BARO. PRESS. 29.22
STATIC PRESS. —
NOMAGRAPH INDEX —

PRE TEST LEAK CHECKS
METER 0.002@ 15 in. Hg
PITOTS @ in. Hg
ORSAT

P#	TIME	T_S °F	Δ P in H_2O	√Δ P	Δ H in H_2O	Vm ft^3	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
Single	0				3.0	591.923	77	70		54	3
	10				3.0	601.8	86	74		54	3
	20				3.0	611.7	90	77		54	3
	30				3.0	621.7	93	78		55	3
	40				3.0	631.6	94	80		54	3
	50				3.0	641.5	94	81		52	3
36	60					651.693					
	~~71~~										
	~~24~~										
	~~77~~										
	~~30~~										
	~~83~~										
C6	~~86~~										
	~~39~~										
	~~42~~										
	~~45~~										
	~~48~~										
	~~51~~										
D6	~~54~~										
	~~57~~										
	~~60~~										
	~~63~~										
	~~66~~										
✓	~~69~~										
	~~72~~										
Avg.					3.00	59.770		82.8			

TIME END = 1345

SB SB SB

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	179	113	3		264
Initial	100	100	0		250
Liquid Collected	79	13	3		14
Total Vol. Collected					109

SB

POST TEST LEAK CHECKS
Meter 0.000 @ 15 in. Hg
Pitots @ in. Hg
Orsat

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average
				.00

PARTICULATE FIELD DATA

PLANT Simi Valley landfill
DATE 10/20/05
LOCATION Simi Valley
OPERATOR EI
SOURCE Flare 2 Inlet
RUN NO. 3 M421 HCl R-3
SAMPLE BOX NO. C-1D
TIME START 0731

METER BOX NO. 4
METER ΔH @ 1.7037
Y= 0.9903
PROBE I.D. NO. –
NOZZLE DIAMETER, in. –
STACK DIAMETER, in. 128
PROBE HEATER SETTING –
HEATER BOX SETTING –
Δ Cp FACTOR 0.84
FILTER NO. –

ASSUMED MOISTURE, % –
AMBIENT TEMPERATURE 58
BARO. PRESS. 29.13
STATIC PRESS. –
NOMAGRAPH INDEX –

PRE TEST LEAK CHECKS
METER 0.015 @ 15 in. Hg
PITOTS @ in. Hg
ORSAT

P#	TIME	T_s °F	ΔP in H_2O	√ΔP	ΔH in H_2O	Vm ft³	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
Single	0				3.0	651.470	56	46		46	3
	10				3.0	661.4	69	49		46	3
	20				3.0	671.4	75	56		46	3
	30				3.0	681.4	77	56		46	3
	40				3.0	691.4	78	58		47	3
	50				3.0	701.2	80	60		47	3
	60					711.120					
Avg.					3.00	59.690		63.3			

TIME END = 0831

SB SB SB

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	140	134	15		264
Initial	100	100	0		250
Liquid Collected	40	34	15		14
Total Vol. Collected					103

SB

POST TEST LEAK CHECKS
Meter 0.009 @ 15 in. Hg
Pitots @ in. Hg
Orsat

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					201

Nozzle Cal	D_1	D_2	D_3	Average

PARTICULATE FIELD DATA

PLANT Simi Valley Landfill
DATE 10/19/05
LOCATION Simi Valley
OPERATOR EE
SOURCE Flare 2 Inc
RUN NO. 1 M429 PAH
SAMPLE BOX NO. C-11
TIME START 0835

METER BOX NO. 7
METER ΔH @ 1.5672
Y= 0.9856
PROBE I.D. NO. CQ-2
NOZZLE DIAMETER, in. 1.054 of
STACK DIAMETER, in. ~~132~~ 128
PROBE HEATER SETTING ~~250~~ - EE
HEATER BOX SETTING 250
Δ Cp FACTOR .84
FILTER NO.

ASSUMED MOISTURE, % 10%
AMBIENT TEMPERATURE 57
BARO. PRESS. 29.22
STATIC PRESS. -0.905
NOMAGRAPH INDEX 250

PRE TEST LEAK CHECKS
METER 0.008 @ 15 in. Hg
PITOTS ø ø @ 3 4 in. Hg
ORSAT

P#	TIME	T_S °F	Δ P in H_2O	√Δ P	Δ H in H_2O	Vm ft^3	$T_{m\,IN}$ °F	$T_{m\,OUT}$ °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A-~~12~~	0	1610	0.015	3.8	~~0.01~~	185.854	58	56	261	50	7
~~11~~	7.5	1697	0.015		3.8	198.5	73	60	259	50	9
~~10~~	15	1680	0.015		3.8	211.1	77	66	259	46	9
~~9~~ 3	22.5	1672	0.015		3.8	212.3	78	68	251	46	9
~~8~~ 2	30	1657	0.015		3.8	221.0	78	69	256	46	9
~~7~~ 1	37.5	1697	0.015		3.8	229.7	79	69	258	46	9
B- 6	45	1700	0.015		3.8	238.419	79	70	261	46	9
5	52.5	1680	0.015		3.8	247.4	79	71	261	47	9
~~4~~ 4	60	1646	0.015		3.8	256.3	79	72	259	46	9
3	67.5	1649	0.015		3.8	265.2	80	72	255	46	9
2	75	1656	0.015		3.8	274.1	81	73	256	47	9
1	82.5	1664	0.015		3.8	283.0	81	74	257	47	9
~~B~~ 6	90	1697	0.015		3.8	291.884	80	73	260	47	9
5	97.5	1641	0.015		3.8	300.8	82	75	259	47	8
~~4~~	105	1637	0.015		3.8	309.7	82	76	254	47	9
3	112.5	1641	0.015		3.8	318.6/327.5	82	77	257	47	9
~~2~~	120	1635	0.015		3.8	~~327.5~~	82	77	257	48	9
~~1~~	127.5	1630	0.015		3.8	336.3	82	77	255	47	9
D- 6	135	1654	0.015		3.8	345.274	84	77	254	44	9
5	142.5	1644	0.015		3.8	354.1	83	77	256	40	9
4	150	1662	0.015		3.8	363.0	83	78	261	46	9
3	157.5	1643	0.015		3.8	371.8	83	78	257	46	9
2	165	1631	0.015		3.8	380.7	84	78	258	46	9
1	172.5	1624	0.015		3.8	389.5	85	79	254	46	9
	180					398.306					
Avg.		1656.1		0.1225	3.80	212.452		76.2			

TIME END = 1150 SB SB SB SB SB

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	305	230	3		284
Initial	100	100	0		250
Liquid Collected	205	130	3		34
Total Vol. Collected					372

SB

POST TEST LEAK CHECKS
Meter 0.005 @ 15 in. Hg
Pitots ø ø @ 3 3 in. Hg
Orsat

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average
				202

PARTICULATE FIELD DATA

PLANT Simi Valley Landfill
DATE 10/20/05
LOCATION Simi Valley
OPERATOR ET
SOURCE Flare 2 Zinc
RUN NO. 2 M429 PAH
SAMPLE BOX NO. C-11
TIME START 0730

METER BOX NO. 7
METER ΔH@ 1.5672
Y= 0.9856
PROBE I.D. NO. CQ-2
NOZZLE DIAMETER, in. 1.054
STACK DIAMETER, in 132 128"
PROBE HEATER SETTING -
HEATER BOX SETTING 250
Δ Cp FACTOR 0.84
FILTER NO.

ASSUMED MOISTURE, % 10 %
AMBIENT TEMPERATURE 58
BARO. PRESS. 29.13
STATIC PRESS. -0.005
NOMAGRAPH INDEX 252

PRE TEST LEAK CHECKS
METER 0.017 @ 15 in. Hg
PITOTS ø ø @ 3/4 in. Hg
ORSAT

P#	TIME	T_s °F	ΔP in H_2O	√ΔP	ΔH in H_2O	Vm ft³	$T_{m\,IN}$ °F	T_{m} OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A 6	0	1577	0.015		3.8	682.790	54	50	249	50	7
5	7.5	1585	0.015		3.8	691.6	69	57	252	48	7
4	15	1552	0.015		3.8	700.4	72	60	263	46	7
3	22.5	1571	0.015		3.8	709.3	73	62	266	46	7
2	30	1563	0.015		3.8	718.2	74	63	258	46	7
1	37.5	1578	0.015		3.8	727.0	76	64	256	46	7
B 6	45	1575	0.015		3.8	735.341	77	65	256	46	7
5	52.5	1573	0.015		3.8	744.7	78	67	257	46	7
4	60	1567	0.015		3.8	753.0	78	68	256	47	7
3	67.5	1594	0.015		3.8	762.5	79	69	259	47	7
2	75	1574	0.015		3.8	770.7	81	70	255	47	7
1	82.5	1595	0.015		3.8	779.9	82	71	255	47	7
C 6	90	1565	0.015		3.8	788.850	80	71	255	47	7
5	97.5	1571	0.015		3.8	797.7	81	73	256	47	7
4	105	1579	0.015		3.8	806.5	82	74	255	47	7
3	112.5	1584	0.015		3.8	815.3	83	75	257	48	7
2	120	1577	0.015		3.8	824.1	83	76	263	48	7
1	127.5	1596	0.015		3.8	833.2	83	77	259	48	7
D 6	135	1579	0.015		3.8	842.113	82	77	254	50	7
5	142.5	1581	0.015		3.8	50.9	84	77	256	45	7
4	150	1571	0.015		3.8	59.7	85	78	255	46	7
7.5 3	~~172.5~~	1567	0.015		3.8	868.8	86	79	259	47	7
2	165	1571	0.015		3.8	877.8	86	79	255	47	7
1	172.5	1594	0.015		3.8	886.7	86	79	254	47	7
	180					896.512					
Avg.		1576.6		0.1225	3.80	213.722		74.5			

TIME END= 1045 SB SB SB SB SB

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	331	194	2		280
Initial	200	100	0		250
Liquid Collected	231	94	2		30
Total Vol. Collected					357

SB

POST TEST LEAK CHECKS
Meter 0.011 @ 15 in. Hg
Pitots ø ø @ 3 3 in. Hg
Orsat

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average

SB

PARTICULATE FIELD DATA

PLANT Simi Valley Landfill
DATE 10/21/05
LOCATION Simi Valley Landfill
OPERATOR EV
SOURCE Flare 2 Inlet
RUN NO. 3 M429 PAH
SAMPLE BOX NO. C-11
TIME START 0700

METER BOX NO. 7
METER ΔH @ 1.5672
Y= 0.9856
PROBE I.D. NO. CC-2
NOZZLE DIAMETER, in. 1.054
STACK DIAMETER, in. 120
PROBE HEATER SETTING -
HEATER BOX SETTING 250
Δ Cp FACTOR 0.84
FILTER NO.

ASSUMED MOISTURE, % 10%
AMBIENT TEMPERATURE 56
BARO. PRESS. 29.09
STATIC PRESS. -0.005
NOMAGRAPH INDEX 250

PRE TEST LEAK CHECKS
METER 0.011 @ 15 in. Hg
PITOTS Ø Ø @ 3/3 in. Hg
ORSAT

P#	TIME	T_s °F	ΔP in H_2O	√ΔP	ΔH in H_2O	Vm ft^3	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A-6	0	1670	0.015		3.8	181.240	51	50	248	46	8
5	7.5	1675	0.015		3.8	190.0	59	55	255	47	8
4	15	1680	0.015		3.8	199.2	69	60	259	47	8
3	22.5	1645	0.015		3.8	207.7	70	61	259	48	8
2	30	1650	0.015		3.8	216.2	73	64	260	47	8
1	37.2	1698	0.015		3.8	224.6	74	65	258	48	9
B-6	45	1662	0.015		3.8	233.566	70	65	254	49	9
5	52.5	1680	0.015		3.8	242.4	75	67	253	46	9
4	60	1657	0.015		3.8	251.4	76	68	256	46	9
3	67.5	1667	0.015		3.8	260.3	77	69	260	47	9
2	75	1656	0.015		3.8	269.2	77	69	258	46	9
1	82.5	1654	0.015		3.8	278.0	77	69	260	46	9
C-6	90	1662	0.015		3.8	287.279	74	69	258	46	9
5	97.5	1686	0.015		3.8	296.0	77	70	258	46	9
4	105	1701	0.015		3.8	304.6	77	70	259	46	10
3	112.5	1676	0.015		3.8	313.3	78	71	259	46	10
2	120	1576	0.015		3.8	321.0	78	71	260	46	10
1	127.5	1562	0.015		3.8	330.7	78	71	259	46	10
D-6	135	1563	0.015		3.8	341.956	75	72	258	46	10
5	142.5	1555	0.015		3.8	353.4	78	72	258	45	10
4	150	1565	0.015		3.8	357.0	78	73	259	45	10
3	157.5	1567	0.015		3.8	364.9	78	73	259	45	10
2	165	1587	0.015		3.8	373.7	77	73	257	45	10
1	172.5	1576	0.015		3.8	382.4	77	73	258	45	10
	180					391.638					
Avg.		1636.3		0.1225	3.80	210.398		70.1			

TIME END = 1180 SB SB SB SB SB

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	304	231	1		284
Initial	100	100	0		250
Liquid Collected	204	131	1		34
Total Vol. Collected					370

PT

POST TEST LEAK CHECKS
Meter 0.008 @ 15 in. Hg
Pitots Ø Ø @ 3 4 in. Hg
Orsat

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					20.1

Nozzle Cal	D_1	D_2	D_3	Average

Data Sheet
CARB Method 430 - Aldehydes

Client: Waste Management
Facility: Simi LF
Source: Flare #2 (John Zink)

Job No.: W07-043
Run No.: 1, 2, 3
Date: 10/19-21/05

Run #1 10/19/05			
	Start	**End**	**Average**
Time,	0830	1639	
Temperature, °F	57	5~~7~~3	
Barometric, P_b	29.22	29.22	
Relative Humidity, %	NA	NA	
Sample Rate, #1 100 cc	12.42 sec	12.44 sec	
#2 100 cc	12.51 sec	12.48 sec	
#3 100 cc	12.44 sec	12.54 sec	
Average	12.46 sec	12.49 sec	
Rotometer Setting cc/min	481.5	480.4	
Leak Check	OK	OK	
Run #2 10/20/05			
	Start	**End**	**Average**
Time,	0700	1500	
Temperature, °F	58	~~58~~ 79	
Barometric, P_b	29.13	29.13	
Relative Humidity, %	NA	NA	
Sample Rate, #1 100 cc	12.44 sec	12.49 sec	
#2 100 cc	12.52 sec	12.42 sec	
#3 100 cc	12.45 sec	12.48 sec	
Average	12.47 sec	12.46 sec	
Rotometer Setting cc/min	481.2	481.5	
Leak Check	OK	OK	
Run #3 10/21/05			
	Start	**End**	**Average**
Time,	0640	1440	
Temperature, °F	56	~~56~~ 72	
Barometric, P_b	29.09	29.09	
Relative Humidity, %	NA	NA	
Sample Rate, #1 100 cc	12.45 sec	12.44 sec	
#2 100 cc	12.42 sec	12.40 sec	
#3 100 cc	12.54 sec	12.51 sec	
Average	12.47 sec	12.45 sec	
Rotometer Setting cc/min	481.2	481.9	
Leak Check	OK	OK	

PARTICULATE FIELD DATA

PLANT ~~City of Vernon~~ Simi Valley Ca
DATE 10/19/05
LOCATION ~~Vernon, CA~~ Simi Ca
OPERATOR CP
SOURCE ~~CTG~~ Flare 2 Zinc
RUN NO. 1 M25 Crit 6
SAMPLE BOX NO. C-9

TIME START 1215

METER BOX NO. 7
METER ΔH@ 1.5672
Y= 0.9856
PROBE I.D. NO. C@-3
NOZZLE DIAMETER, in. 1.054
STACK DIAMETER, in. 128"
PROBE HEATER SETTING NA
~~HEATER BOX SETTING~~ NA
Δ Cp FACTOR 0.84
FILTER NO. ~~NA~~

ASSUMED MOISTURE, % 10 %
AMBIENT TEMPERATURE 68
BARO. PRESS. 29.22
STATIC PRESS. -0.03
NOMAGRAPH INDEX 250

PRE TEST LEAK CHECKS
METER 0.017 @ 15 in. Hg
PITOTS ~~0~~ ~~0~~ @ 3/4 in. Hg
ORSAT

P#	TIME	T_S °F	Δ P in H_2O	√Δ P	Δ H in H_2O	Vm ft^3	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A6	0	1645	0.015		3.8	398.855	77	73	-	49	6
5	10	1646	0.015		3.8	410.7	81	77	-	48	6
4	20	1637	0.015		3.8	422.6	86	78	-	48	6
3	30	1652	0.015		3.8	434.2	88	79	-	49	6
2	40	1577	0.015	0.015	3.8	445.9	88	81		50	6
1	50	1550	0.015		3.8	457.8	89	82		48	6
B6	60	1584	0.015		3.8	469.678	87	82		46	6
5	70	1561	0.015		3.8	481.6	88	83		46	6
4	80	1541	0.015		3.8	493.4	89	83		46	6
3	90	1555	0.015		3.8	505.2	91	84		46	6
2	100	1552	0.015		3.8	517.1	91	84		46	6
1	110	1566	0.015		3.8	528.7	91	84		47	6
C6	120	1561	0.015		3.8	540.309	86	82		50	6
5	130	1594	0.015		3.8	552.1	91	85		47	6
4	140	1577	0.015		3.8	564.0	91	85		47	6
3	150	1563	0.015		3.8	575.8	91	85		46	6
2	160	1530	0.015		3.8	587.7	91	85		46	6
1	170	1544	0.015		3.8	599.5	91	85		47	6
D6	180	1496	0.015		3.8	610.710	92	85		46	6
5	190	1518	0.015		3.8	622.3	90	84		47	6
4	200	1544	0.015		3.8	634.2	89	84		46	6
3	210	1564	0.015		3.8	646.2	89	83		46	6
2	220	1527	0.015		3.8	658.1	88	82		45	6
1	230	1537	0.015		3.8	670.1	86	81		45	6
	240					682.112					
Avg.		1567.5		0.1225	3.80	283.257		85.4			

TIME END = 1635 SB SD SB SD SB

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	350	253	15		288
Initial	100	100	0		250
Liquid Collected	250	153	15		38
Total Vol. Collected					456

SD

POST TEST LEAK CHECKS
Meter 0.009 @ 15 in. Hg
Pitots ~~0~~ ~~0~~ @ 3/4 in. Hg
Orsat

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average
				206

PARTICULATE FIELD DATA

PLANT Simi Valley Landfill
DATE 10/20/05
LOCATION Simi
OPERATOR EE
SOURCE Flare 2
RUN NO. 2 1425 Cfm
SAMPLE BOX NO. C9
TIME START 1100

METER BOX NO. 7
METER ΔH@ 1.5672
Y= 0.9856
PROBE I.D. NO. CQ-7
NOZZLE DIAMETER, in. 1.054
STACK DIAMETER, in. 128
PROBE HEATER SETTING -
HEATER BOX SETTING 250
Δ Cp FACTOR 0.84
FILTER NO.

ASSUMED MOISTURE, % 10%
AMBIENT TEMPERATURE 68
BARO. PRESS. 29.13
STATIC PRESS. -0.005
NOMAGRAPH INDEX 252

PRE TEST LEAK CHECKS
METER 0.019 @ 15 in. Hg
PITOTS Ø Ø @ 3/3 in. Hg
ORSAT

P#	TIME	T_s °F	ΔP in H_2O	√ΔP	ΔH in H_2O	Vm ft³	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A-6	0	1580	0.015		3.8	897.805	77	77		57	3
5	10	1554	0.015		3.8	909.6	83	77		46	3
4	20	1538	0.015		3.8	921.5	86	77		47	3
3	30	1533	0.015		3.8	933.1	87	79		46	3
2	40	1549	0.015		3.8	944.9	87	80		47	3
1	50	1547	0.015		3.8	956.7	89	80		49	3
B-6	60	1551	0.015		3.8	968.512	86	80		48	3
5	70	1545	0.015		3.8	977.3	89	81		48	3
4	80	1538	0.015		3.8	988.9	90	81		47	3
3	90	1533	0.015		3.8	1000.7	89	81		47	3
2	100	1558	0.015		3.8	1015.2	90	82		47	3
1	110	1541	0.015		3.8	1026.7	89	82		46	3
C-6	120	1535	0.015		3.8	1038.568	85	82		48	3
5	130	1537	0.015		3.8	1050.4	87	82		46	3
4	140	1547	0.015		3.8	1062.1	88	81		47	3
3	150	1555	0.015		3.8	1073.9	88	81		46	3
2	160	1550	0.015		3.8	1085.8	88	81		47	3
1	170	1563	0.015		3.8	1097.7	88	81		47	3
D-6	180	1548	0.015		3.8	1109.538	88	81		47	3
5	190	1555	0.015		3.8	1121.3	88	81		46	3
4	200	1554	0.015		3.8	1133.2	88	81		46	3
3	210	1546	0.015		3.8	1145.2	88	80		46	3
2	220	1547	0.015		3.8	1156.9	88	82		47	3
1	230	1540	0.015		3.8	1168.8	89	81		48	3
	240					1180.696					
Avg.		1547.8		0.1225	3.80	282.891		83.8			

TIME END= 1515

SB SB SB SB SB

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	344	278	21		283
Initial	100	100	0		250
Liquid Collected	244	178	21		33
Total Vol. Collected					476

SB

POST TEST LEAK CHECKS
Meter 0.019 @ 15 in. Hg
Pitots Ø Ø @ 3/3 in. Hg
Orsat

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average

PARTICULATE FIELD DATA

PLANT Simi landfill
DATE 10/21/05
LOCATION Simi
OPERATOR EL
SOURCE Flare 2 M425C, ftG
RUN NO. 3 M425 Cn ftG
SAMPLE BOX NO.
TIME START 0700

METER BOX NO. 4
METER ΔH@ 1.7037
Y= 0.9903
PROBE I.D. NO. C013
NOZZLE DIAMETER, in. 0.1.057
STACK DIAMETER, in. 128
PROBE HEATER SETTING —
HEATER BOX SETTING —
Δ Cp FACTOR 0.84
FILTER NO.

ASSUMED MOISTURE, % 10%
AMBIENT TEMPERATURE 56
BARO. PRESS. 29.09
STATIC PRESS. -0.005
NOMAGRAPH INDEX 380

PRE TEST LEAK CHECKS
METER 0.009 @ 15 in. Hg
PITOTS Ø Ø @ 3/3 in. Hg
ORSAT

P#	TIME	T_s °F	ΔP in H_2O	√ΔP	ΔH in H_2O	Vm ft³	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A 6	0	1624	0.015		4.2	712.120	51	51		50	5
5	10	1659	0.015		4.2	724.2	76	54		45	5
4	20	1551	0.015		4.2	736.4	73	60		47	5
3	30	1645	0.015		4.2	748.7	73	60		46	5
2	40	1602	0.015		4.2	761.0	79	60		46	5
1	50	1681	0.015		4.2	770.7	80	61		46	5
B 6	60	1649	0.015		4.2	782.244	75	60		48	5
5	70	1660	0.015		4.2	793.8	81	62		47	5
4	80	1654	0.015		4.2	805.4	78	63		46	5
3	90	1662	0.015		4.2	817.0	81	63		46	5
2	100	1671	0.015		4.2	828.7	80	63		46	5
1	110	1675	0.015		4.2	840.3	79	63		46	5
C 6	120	1582	0.015		4.2	891.997	77	62		46	5
5	130	1560	0.015		4.2	863.9	80	63		46	5
4	140	1567	0.015		4.2	875.2	80	63		46	5
3	150	1555	0.015		4.2	886.7	80	63		47	5
2	160	1570	0.015		4.2	898.3	81	63		47	5
1	170	1576	0.015		4.2	910.5	82	65		46	5
D 6	180	1572	0.015		4.2	921.947	81	65		46	5
5	190	1554	0.015		4.2	933.7	82	65		47	5
4	200	1585	0.015		4.2	945.0	80	66		46	5
3	210	1592	0.015		4.2	956.4	79	66		46	5
2	220	1558	0.015		4.2	967.8	78	65		46	5
1	230	1572	0.015		4.2	979.2	80	65		46	5
	240					991.938					
Avg.		1607.7		0.1225	4.20	279.818		69.9			

TIME END= 1125 SB SB SB SB SB

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	326	369	56		295
Initial	100	100			250
Liquid Collected	226	209	56		45
Total Vol. Collected					536

SB

POST TEST LEAK CHECKS
Meter 0.006 @ 15 in. Hg
Pitots Ø Ø @ 4/3 in. Hg
Orsat

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					100

Nozzle Cal	D_1	D_2	D_3	Average

PARTICULATE FIELD DATA

PLANT Simi Valley L.F.
DATE 11-21-05
LOCATION Simi Valley L.F
OPERATOR TW + MB
SOURCE Flare #2 Zink
RUN NO. 1 Mettler 475
SAMPLE BOX NO. C-3

TIME START 0825
C58-001

METER BOX NO. #7
METER ΔH @ 1.759
Y= 0.999
PROBE I.D. NO. CQ # 4
NOZZLE DIAMETER, in. 0.194
STACK DIAMETER, in. 128"
PROBE HEATER SETTING NA
HEATER BOX SETTING NA
Δ Cp FACTOR 0.84
FILTER NO.

ASSUMED MOISTURE, % 10%
AMBIENT TEMPERATURE 60 °F ↑
BARO. PRESS. 29.85
STATIC PRESS. -.003
NOMAGRAPH INDEX 210 220

PRE TEST LEAK CHECKS
METER 0.005 @ 17 in. Hg
PITOTS ✓✓ @ 4.5 in. Hg
ORSAT NA

P#	TIME	T_s °F	Δ P in H_2O 0.012	√Δ P	Δ H in H_2O 2.6	Vm ft^3	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A 6	00	1670	~~0.015~~	NA	~~3.5~~	930.346	69	69	NA	48	13.5
5	10	1692	0.012		2.6	939.9	82	75		49	14.0
4	20	1683	0.012		2.6	948.9	90	82		52	15
3	30	1675	0.012		2.6	957.8	94	85		52	16
2	40	1682	0.012		2.6	967.2	95	90		54	17
1	50	1695	0.012		2.6	976.0	101	95		55	18
B 6	00	1678	0.012		2.6	*185.109	98	93		52	10
5	10	1683	0.012		2.6	994.3	110	99		54	8
4	20	1696	0.012		2.6	1003.4	118	104		55	8
3	90	1703	0.012		2.6	1012.6	119	106		56	8
2	100	1670	0.012		2.6	1021.8	119	108		56	8
1	110	1706	0.012		2.6	1031.1	120	111		57	8
C 6	120	1678	0.012		2.6	*1040.287	114	109		55	8
5	130	1663	0.012		2.6	1049.5	115	110		55	8
4	140	1685	0.012		2.6	1058.9	112	107		57	8
3	150	1698	0.012		2.6	1068.2	107	101		57	8
2	160	1686	0.012		2.6	1077.1	107	99		56	8
1	170	1708	0.012		2.6	1086.2	106	97		56	8
D 6	180	1685	0.012		2.6	*1095.310	103	95		54	8
5	190	1662	0.012		2.6	1104.5	110	95		56	8
4	200	1684	0.012		2.6	1113.7	111	97		56	8
3	210	1680	0.012	1122.9	2.6	1122.9	112	99		54	8
2	220	1702	0.012		2.6	1132.1	113	100		57	8
1	230	1672	0.012		2.6	1141.5	113	101		57	8
STOP	240	—	—		2.6	*1150.898	—	—		—	—
Avg.		1685	~~0.012~~ 0.1095	✓	2.6	220.500		101.4			

TIME END = 12:53

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	341	215	10		281
Initial	100	100	0		250
Liquid Collected	241	115	10		31
Total Vol. Collected				397	

POST TEST LEAK CHECKS
Meter 0.005 ✓ @ 15 in. Hg
Pitots ✓✓ @ 4.0 in. Hg
Orsat NA

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					209

Nozzle Cal	D_1	D_2	D_3	Average

PARTICULATE FIELD DATA

PLANT Simi Valley L.F.
DATE 11-21-05
LOCATION Simi Valley L.F
OPERATOR TW + MB
SOURCE Flare #2 Zink
RUN NO. 2 PM25
SAMPLE BOX NO. C-9

TIME START 13:25

C58-001

METER BOX NO. 7
METER ΔH @ 1.75"
Y= 0.9979
PROBE I.D. NO. CQ #4
NOZZLE DIAMETER, in. 0.494
STACK DIAMETER, in. 128"
PROBE HEATER SETTING M
HEATER BOX SETTING NA
Δ Cp FACTOR 0.84
FILTER NO.

ASSUMED MOISTURE, % 10%
AMBIENT TEMPERATURE 72°F
BARO. PRESS. 29.85
STATIC PRESS. -.60
NOMAGRAPH INDEX 210

PRE TEST LEAK CHECKS
METER Leak @ 15 in. Hg
PITOTS ✓✓ @ 4.5 in. Hg
ORSAT NA

P#	TIME	T_s °F	Δ P in H_2O	√Δ P	Δ H in H_2O	Vm ft^3	$T_{m\ IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A 6	00	1706	0.012	NA	2.5	154.209	95	95	NA	46	7
5	10	1716	0.012		2.5	163.4	99	94		48	7
4	20	1710	0.012		2.5	172.3	103	94		49	7
3	30	1687	0.012		2.5	181.6	104	93		49	7
2	40	1691	0.012		2.5	190.8	104	93		51	7
1	50	1680	0.012		2.5	200.0	105	93		53	7
B 6	60	1685	0.012		2.5	209.264	100	92		51	7
5	70	1708	0.012		2.5	218.4	93	90		52	7
4	80	1740	0.012		2.5	227.4	99	90		52	7
3	90	1753	0.012		2.5	236.4	102	90		53	7
2	100	1732	0.012		2.5	245.3	103	91		54	7
1	110	1702	0.012		2.5	254.2	104	91		55	7
C 6	120	1740	0.012		2.5	363.265	99	90		51	7
5	130	1715	0.012		2.5	272.1	104	92		52	7
4	140	1691	0.012		2.5	281.0	104	92		52	7
3	150	1725	0.012		2.5	289.9	104	92		54	7
2	160	1706	0.012		2.5	298.8	103	92		54	7
1	170	1722	0.012		2.5	307.7	100	92		55	7.5
D 6	180	1712	0.012		2.5	316.624	93	89		49	7.5
5	190	1743	0.012		2.5	325.6	100	89		52	7.5
4	200	1726	0.012		2.5	334.6	102	89		53	7.5
3	210	1708	0.012		2.5	343.6	102	89		54	7.5
2	220	1699	0.012		2.5	352.5	101	90		54	7.5
1	230	1715	0.012		2.5	361.5	99	89		56	7.5
EDP	240	—	—		—	370.409	—	—		—	—
Avg.		1713	0.1095		2.5	216.200	100.3	91.5			

TIME END = 15:50

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	326	220	10		2854
Initial	100	100	0		250
Liquid Collected	226	120	10		34
Total Vol. Collected					390

POST TEST LEAK CHECKS
Meter 2.005 @ 16 in. Hg
Pitots ✓✓ @ 5" in. Hg
Orsat NA

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					210

Nozzle Cal	D_1	D_2	D_3	Average

PARTICULATE FIELD DATA

PLANT Simi Valley L.F.
DATE 11-22-05
LOCATION Simi Valley L.F
OPERATOR TW + MB
SOURCE Flare #3 Zink
RUN NO. 3
SAMPLE BOX NO. C-3

TIME START 0715

METER BOX NO. 7
METER ΔH @ 1.754
Y= 0.9999
PROBE I.D. NO. CQ #4
NOZZLE DIAMETER, in. 0.494
STACK DIAMETER, in. 125"
PROBE HEATER SETTING NA
HEATER BOX SETTING NA
Δ Cp FACTOR 0.84
FILTER NO.

ASSUMED MOISTURE, % 10%
AMBIENT TEMPERATURE 62°F ↑
BARO. PRESS. 29.79
STATIC PRESS. -.03
NOMAGRAPH INDEX 210

PRE TEST LEAK CHECKS
METER 0.005 @ 16 in. Hg
PITOTS ✓✓ @ 4.5 in. Hg
ORSAT NA

P#	TIME	T_s °F	Δ P in H_2O	√Δ P	Δ H in H_2O	Vm ft^3	$T_{m\ IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A 6	00	1635	0.012	NA	2.5	370.618	67	67	NA	45	6.5
5	10	1670	0.012		2.5	379.5	79	68		47	6.5
4	20	1639	0.012		2.5	388.3	86	71		49	6.5
3	30	1650	0.012		2.5	397.1	90	74		50	6.5
2	40	1632	0.012		2.5	406.1	92	76		51	6.5
1	50	1642	0.012		2.5	415.0	~~90~~ 94	79		52	6.5
B 6	60	1665	0.012		2.5	423.825	88	~~82~~ 80		50	6.5
5	70	1621	0.012		2.5	432.7	94	82		50	6.5
4	80	1634	0.012		2.5	441.6	95	83		51	6.5
3	90	1626	0.012		2.5	450.5	96	84		51	6.5
2	100	1615	0.012		2.5	459.4	98	85		52	6.5
1	110	1599	0.012		2.5	468.3	101	85		53	6.5
C 6	120	1664	0.012		2.5	477.307	94	84		49	7
5	130	1647	0.012		2.5	486.3	100	89		51	7
4	140	1668	0.012		2.5	495.4	101	90		52	7
3	150	1652	0.012		2.5	504.4	102	89		52	7
2	160	1674	0.012		2.5	513.5	104	90		53	7
1	170	1619	0.012		2.5	522.4	106	92		55	7
D 6	180	1628	0.012		2.5	531.498	99	90		50	7
5	190	1636	0.012		2.5	540.5	107	94		52	7
4	200	1642	0.012		2.5	549.6	104	94		52	7
3	210	1691	0.012		2.5	558.6	105	94		53	7.5
2	220	1657	0.012		2.5	567.7	104	94		54	7.5
1	230	1628	0.012		2.5	576.7	103	94		54	7.5
ESDP	240	—	—		—	585.743	—	—		—	—
Avg.		1643.1	0.1095		2.5	215.1250		90.4			

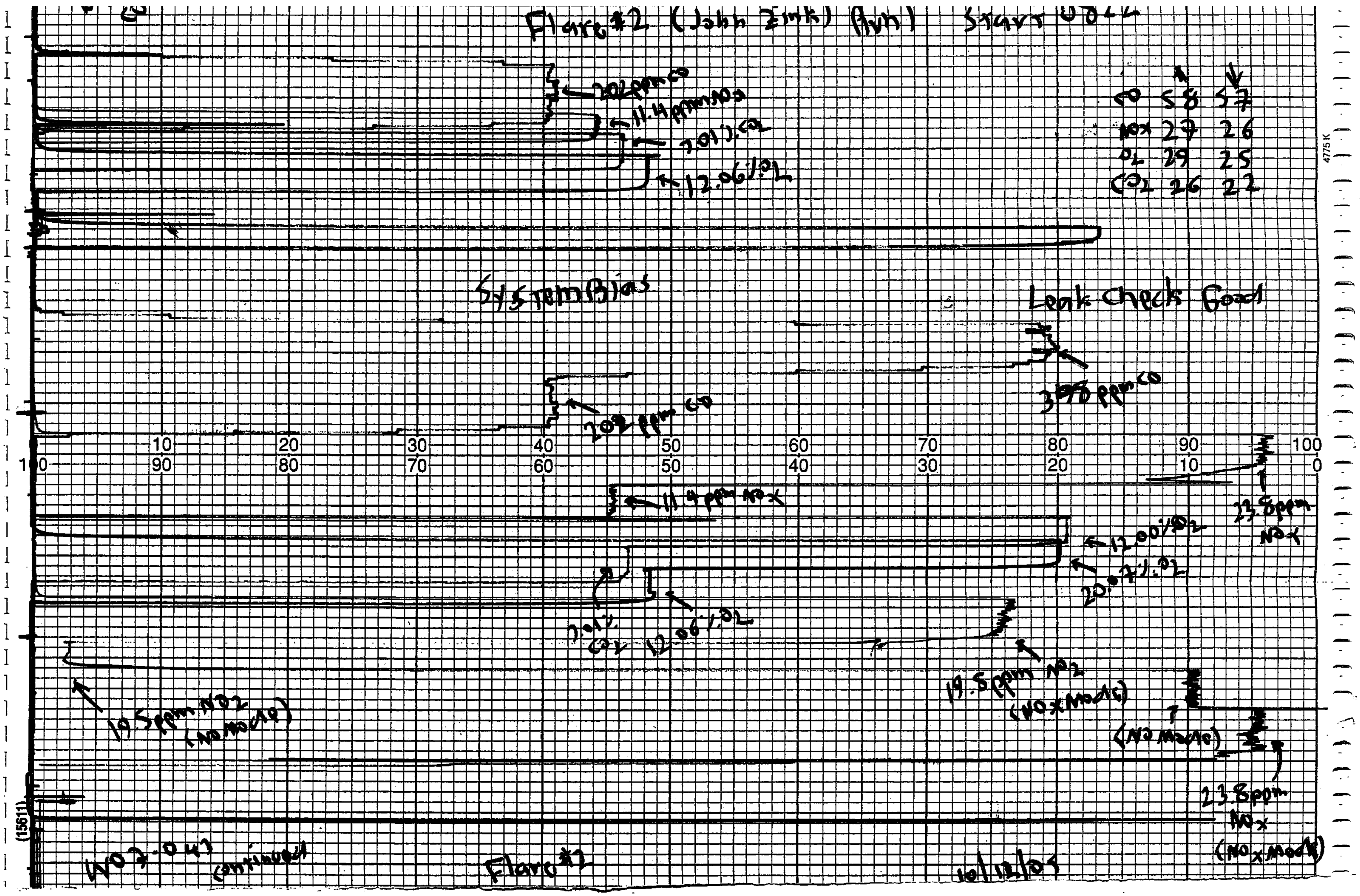
TIME END = 11:47

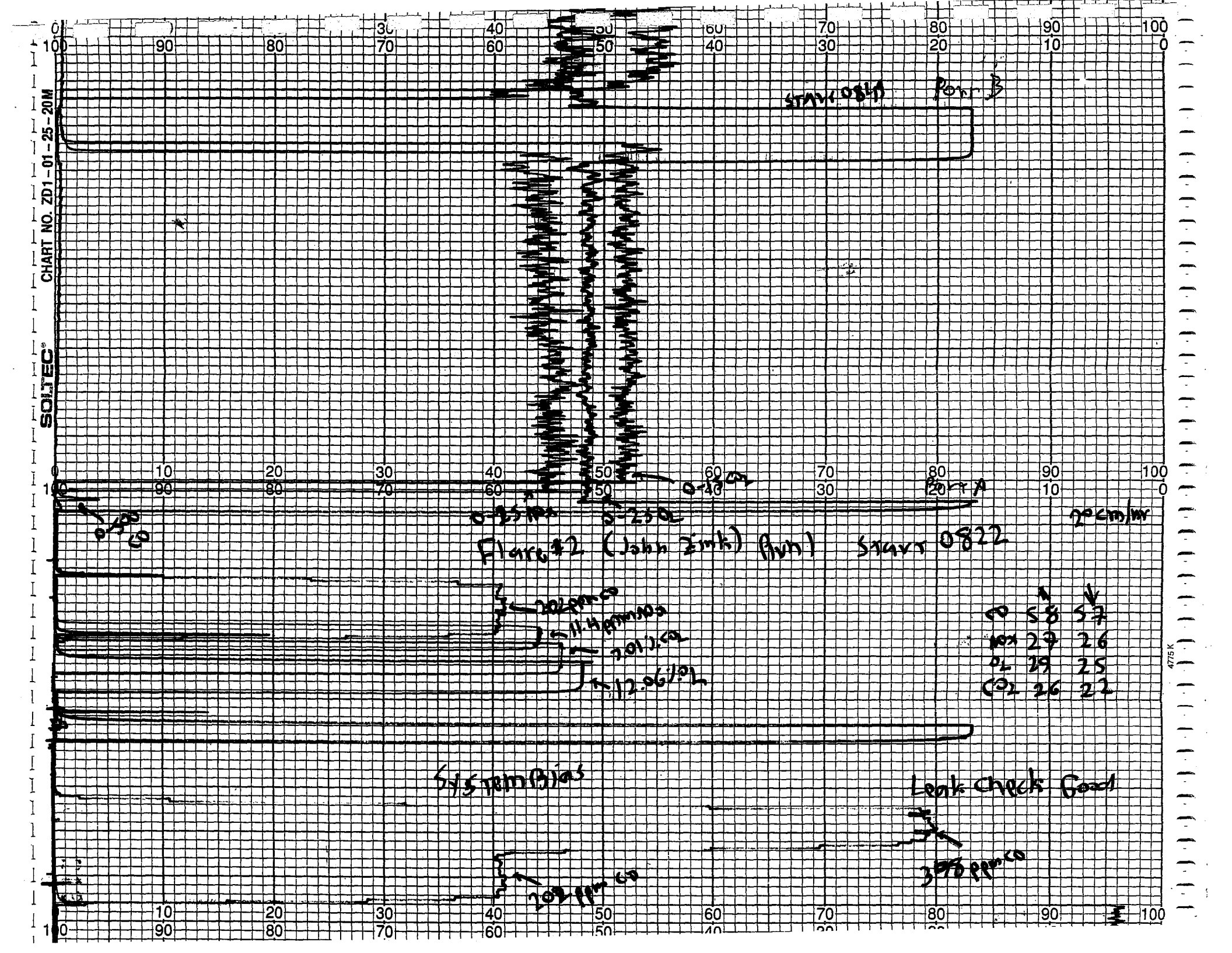
Volume of Liquid Water Collected	Impinger Volume				X Silica Gel Wght.
	1	2	3	4	5
Final	329	177	8		273
Initial	100	100	0		250
Liquid Collected	229	77	8		23
Total Vol. Collected					337

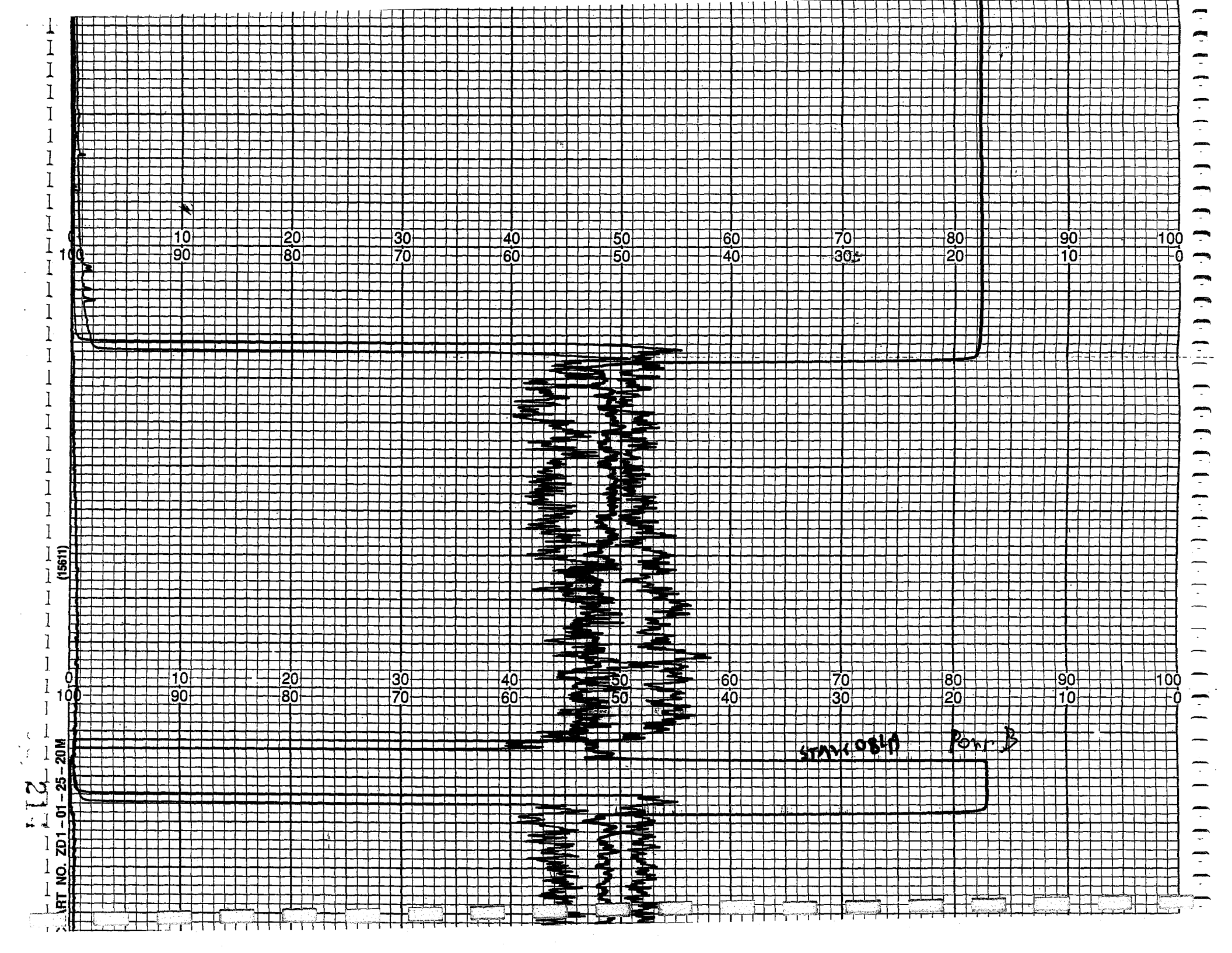
POST TEST LEAK CHECKS
Meter 0.005 @ 15 in. Hg
Pitots ✓✓ @ 4 in. Hg
Orsat NA

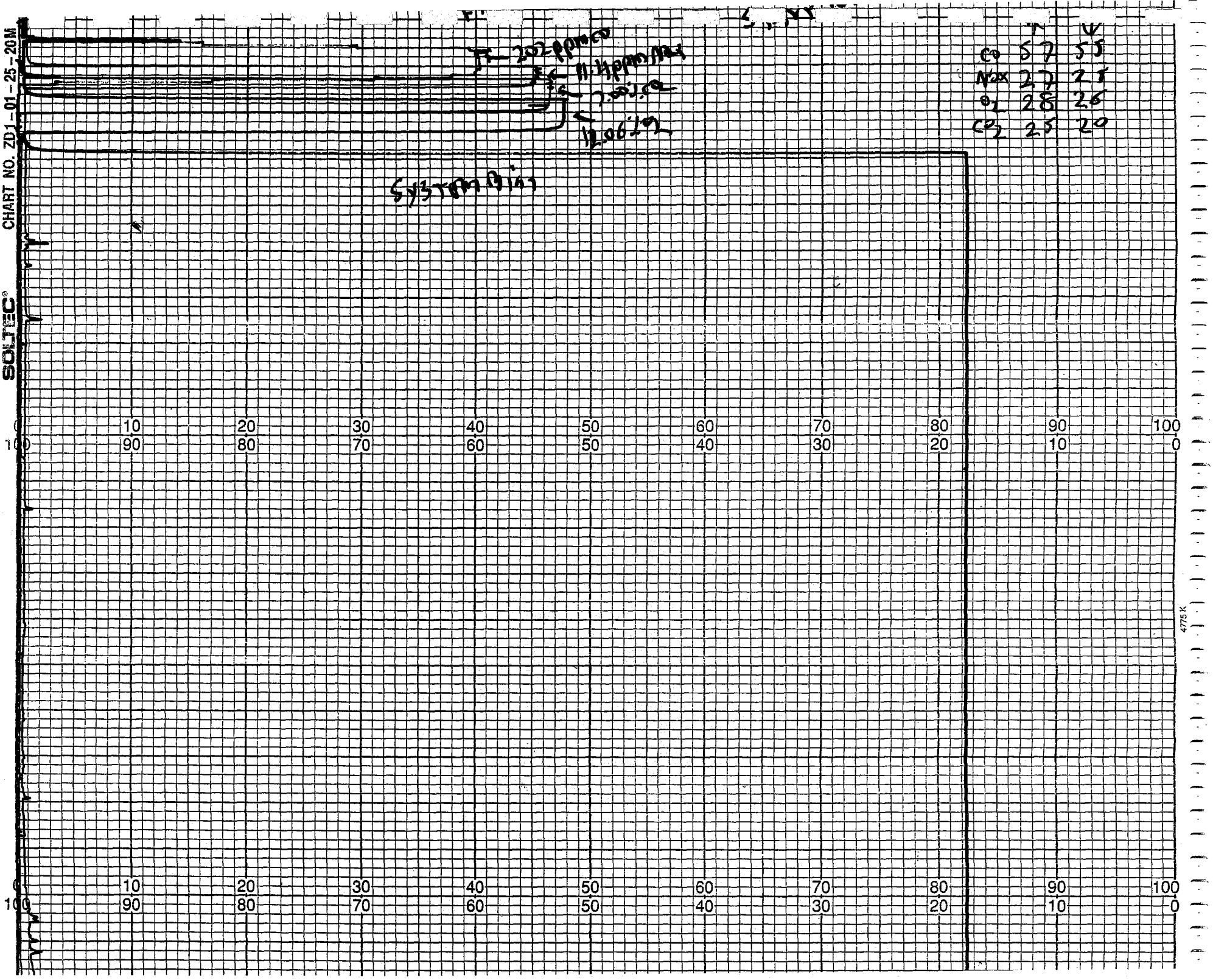
Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average

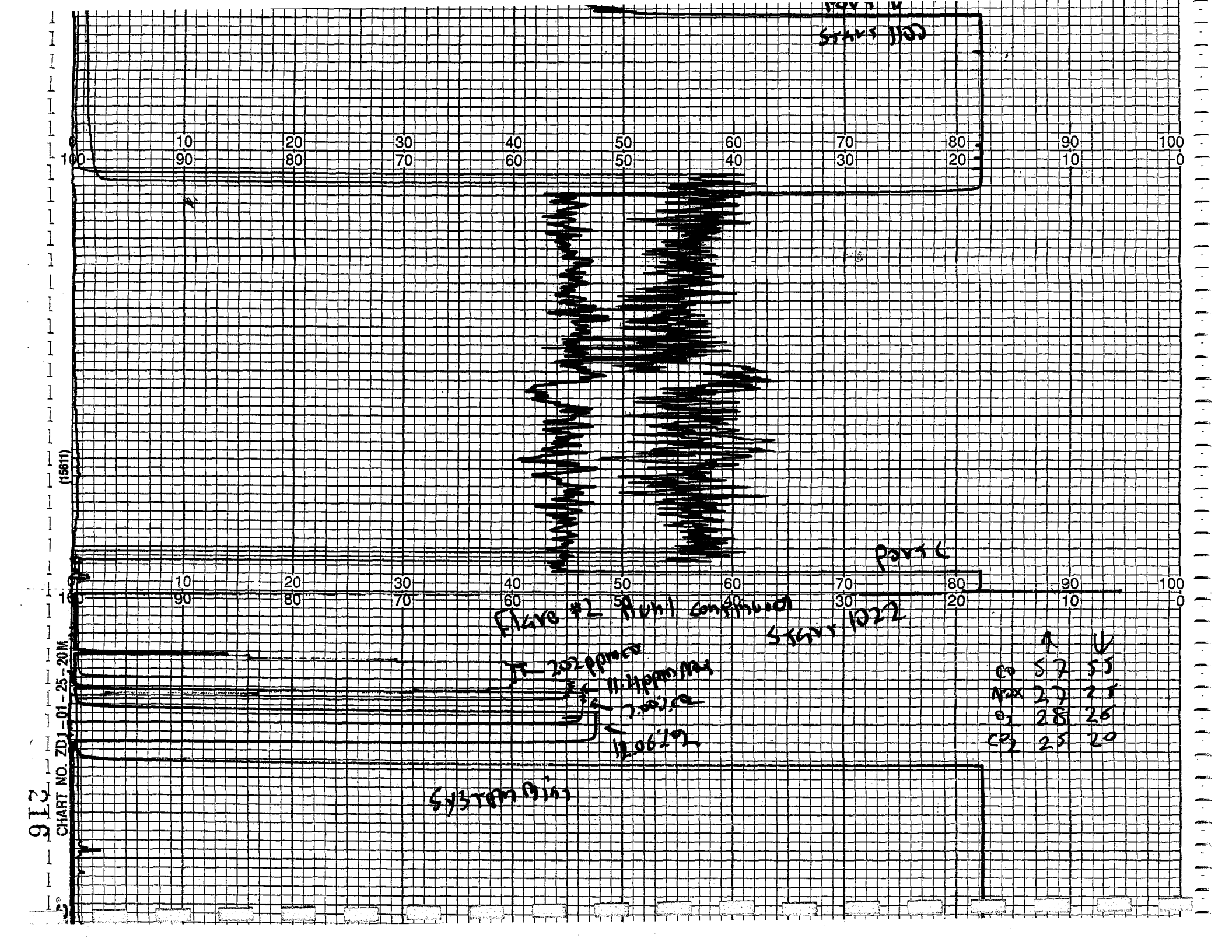

Flare #2 (John Zink) (Run) Start 0822
202 ppm CO
11.4 ppm NOx
20.1% O2
12.06% O2
CO 58 57
NOx 27 26
O2 29 25
CO2 26 22
System Bias
Leak Check Good
202 ppm CO
10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
11.4 ppm NOx
23.8 ppm NOx
12.06% O2
20.7% O2
20.1% O2
12.06% O2
19.5 ppm NO2 (NOx Mode)
19.5 ppm NO2 (NO Mode)
(NO Mode)
23.8 ppm NOx (NOx Mode)
4775 K
(15611)
Flare #2
10/12/05
continued


SOLTEC
CHART NO. ZD1-01-25-20M
Flare #2 (John Zink) flow
Leak Check Good
System Bias
4775K


0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
(15611)
ART NO. ZD1-01-25-20M


SOLTEC®
CHART NO. ZD1-01-25-20M
10
90
20
80
30
70
40
60
50
50
60
40
70
30
80
20
90
10
100
0
4775 K

215


(15611)
CHART NO. ZD1-01-25-20M
10 90 20 80 30 70 40 60 50 50 60 40 70 30 80 20 90 10 100 0
Part C
Figure #2 Run 1 continued
Start 1022
CO 57 55
NOx 27 21
O2 28 26
CO2 25 20

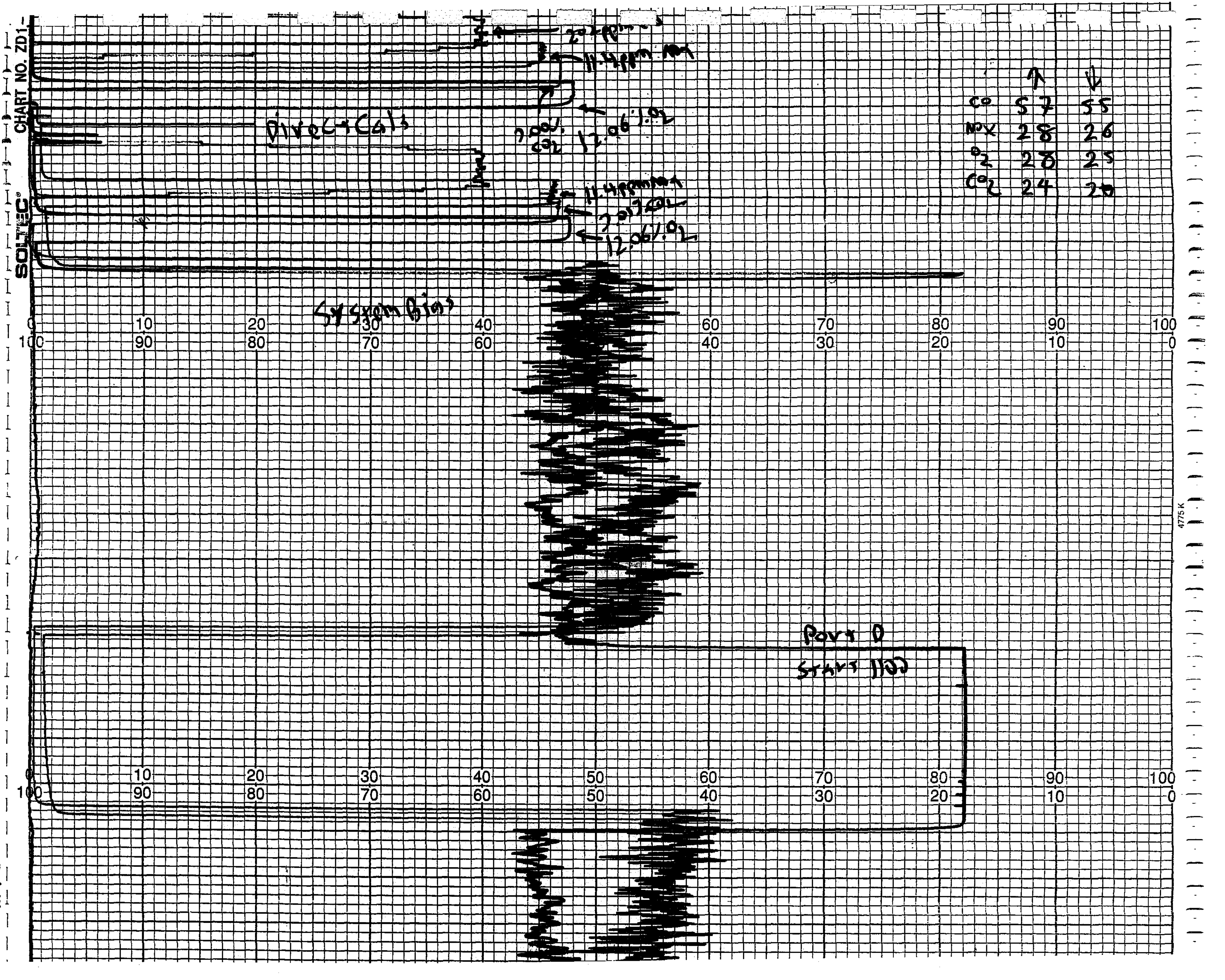
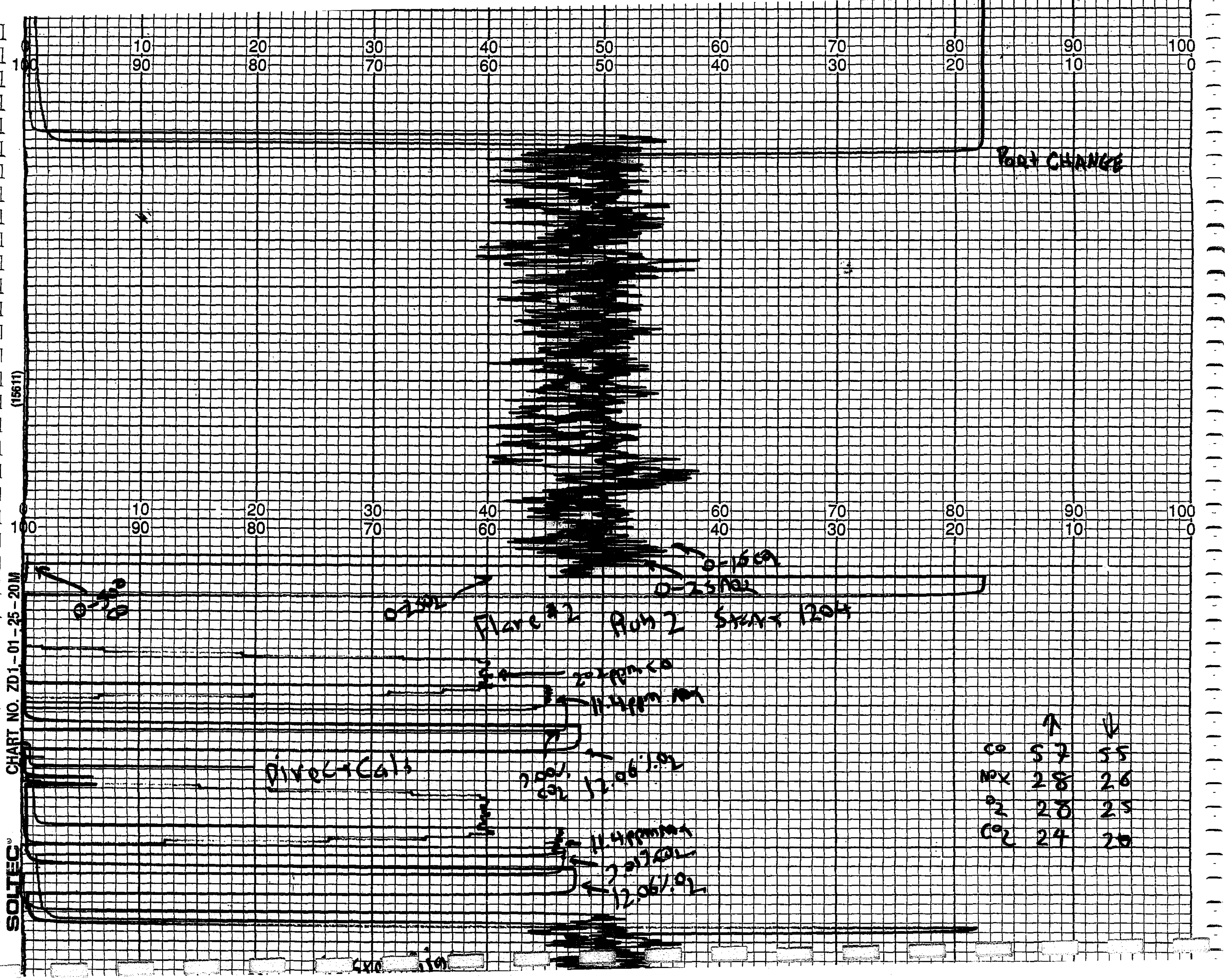
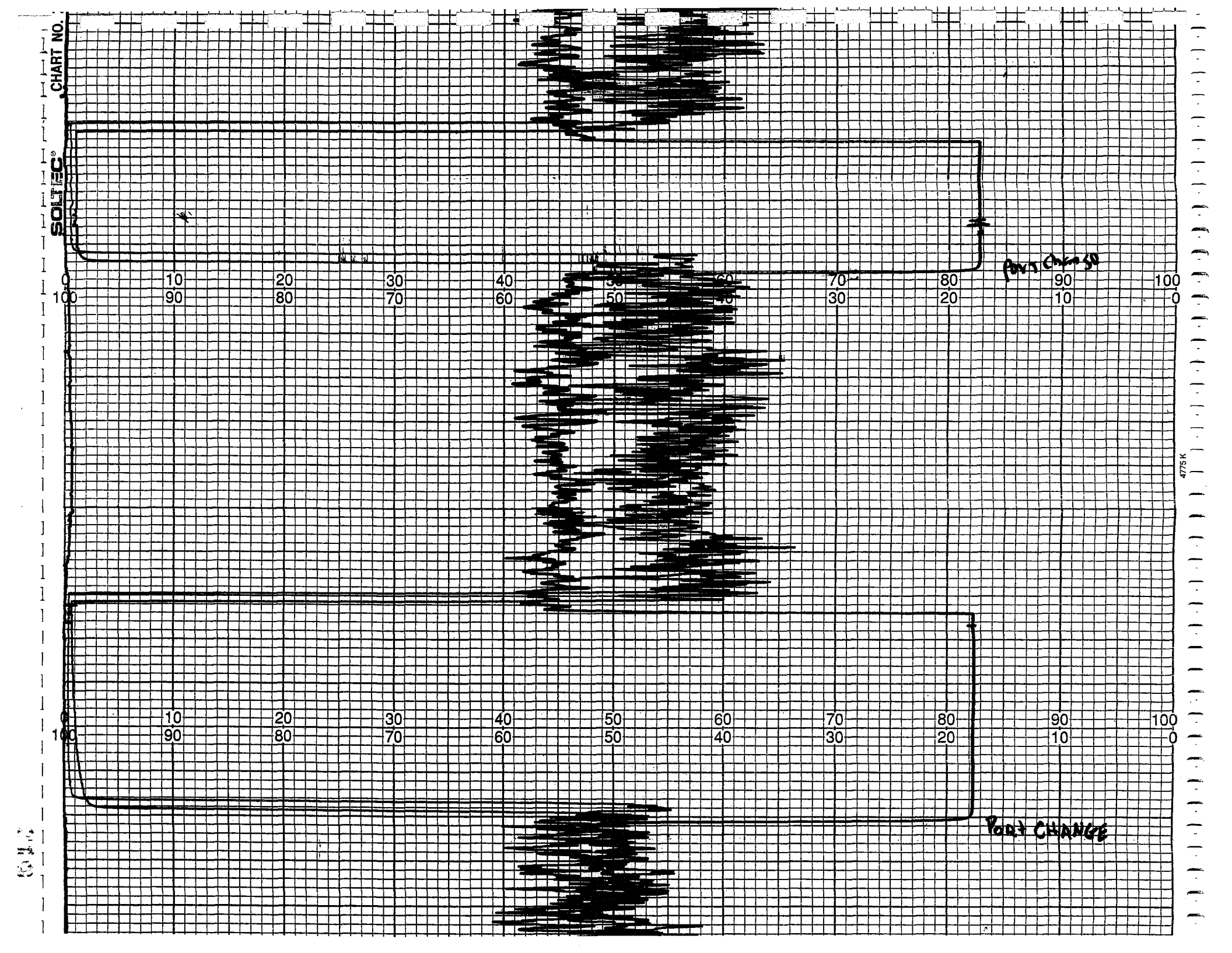
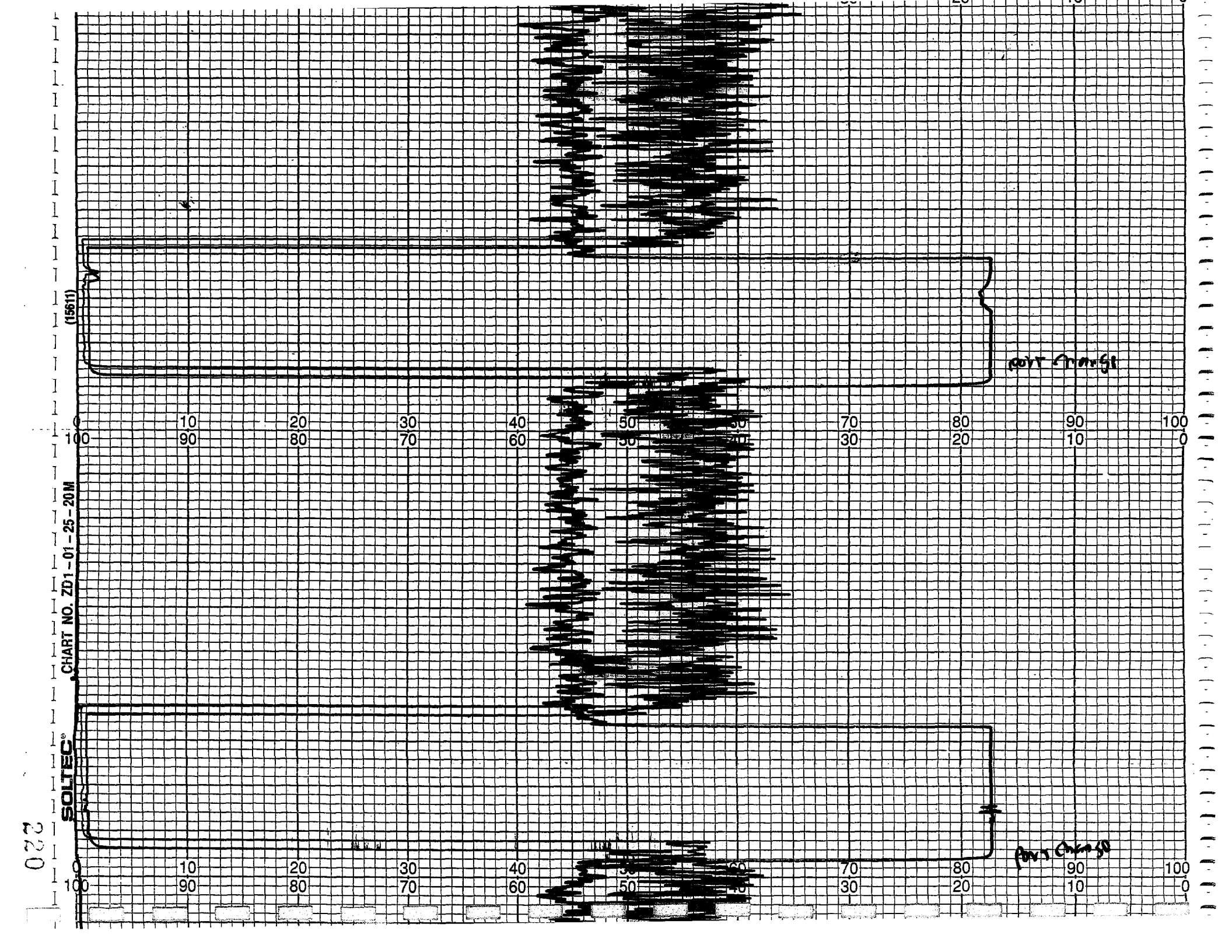
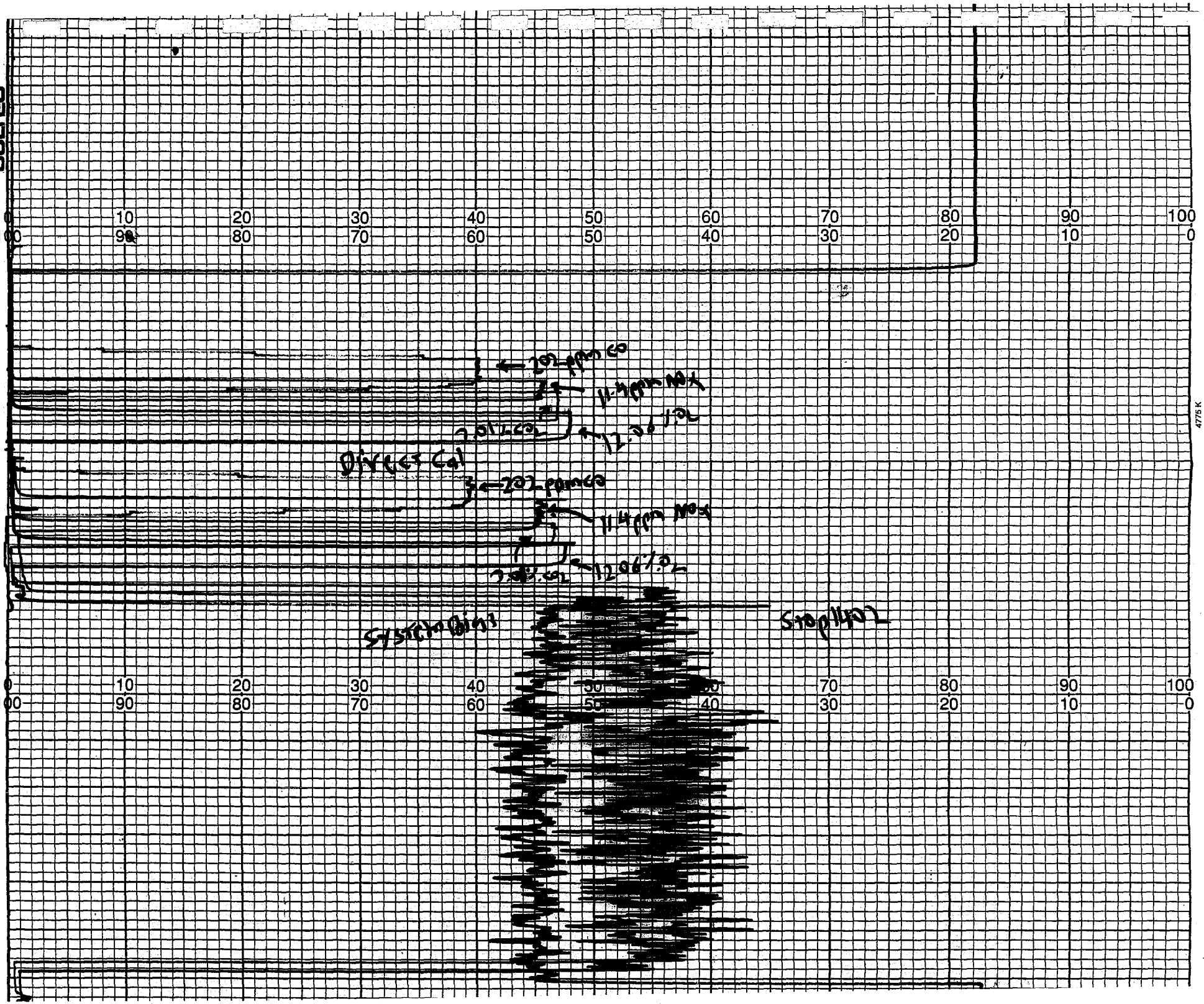


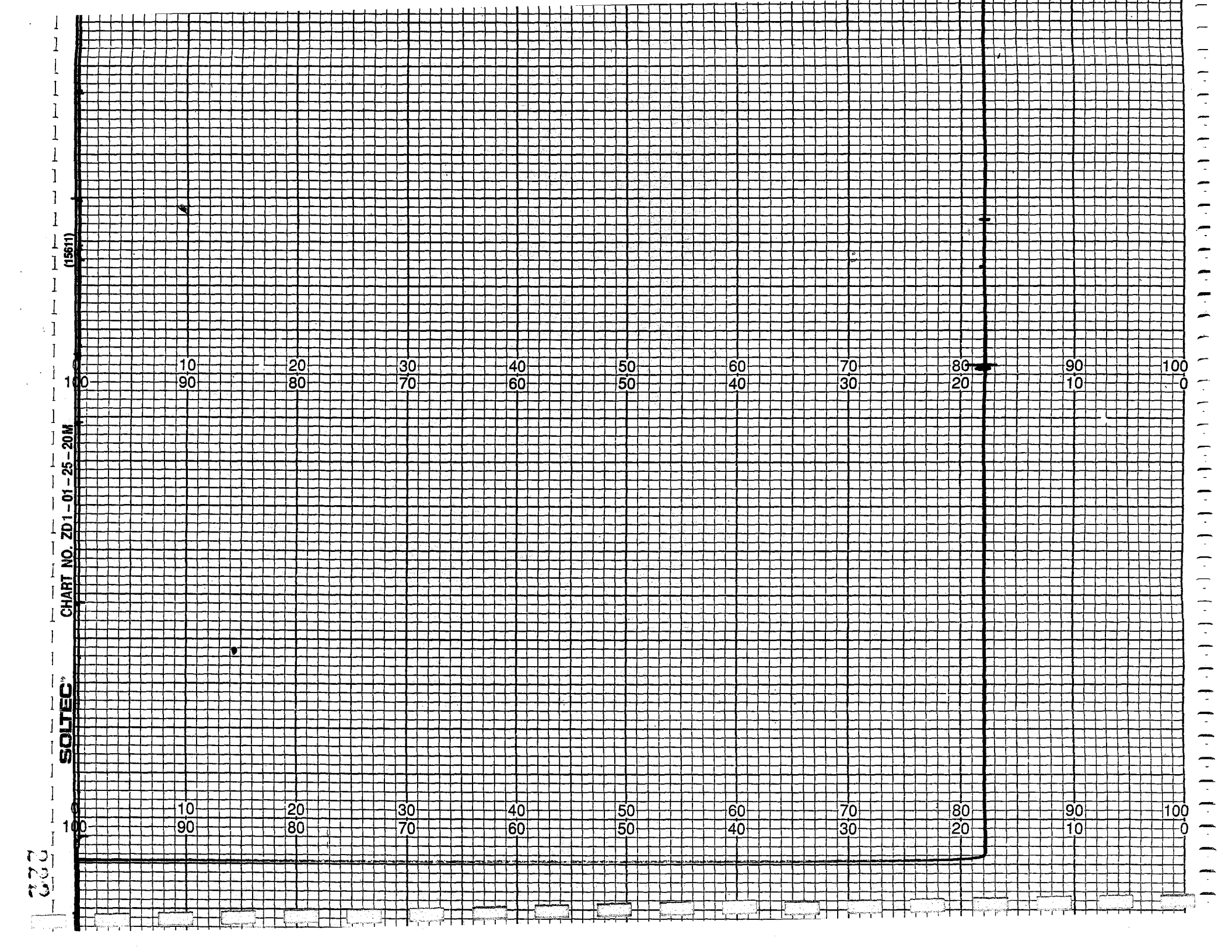
CHART NO. ZD1-
SOLTEC
Direct Cals
11.4 ppm NOx
20.0% CO2
12.06% O2
11.4 ppm NOx
20.0% CO2
12.06% O2
System Bias
Port D
Start 1100
CO 57 55
NOx 28 26
O2 28 25
CO2 24 20
4775 K

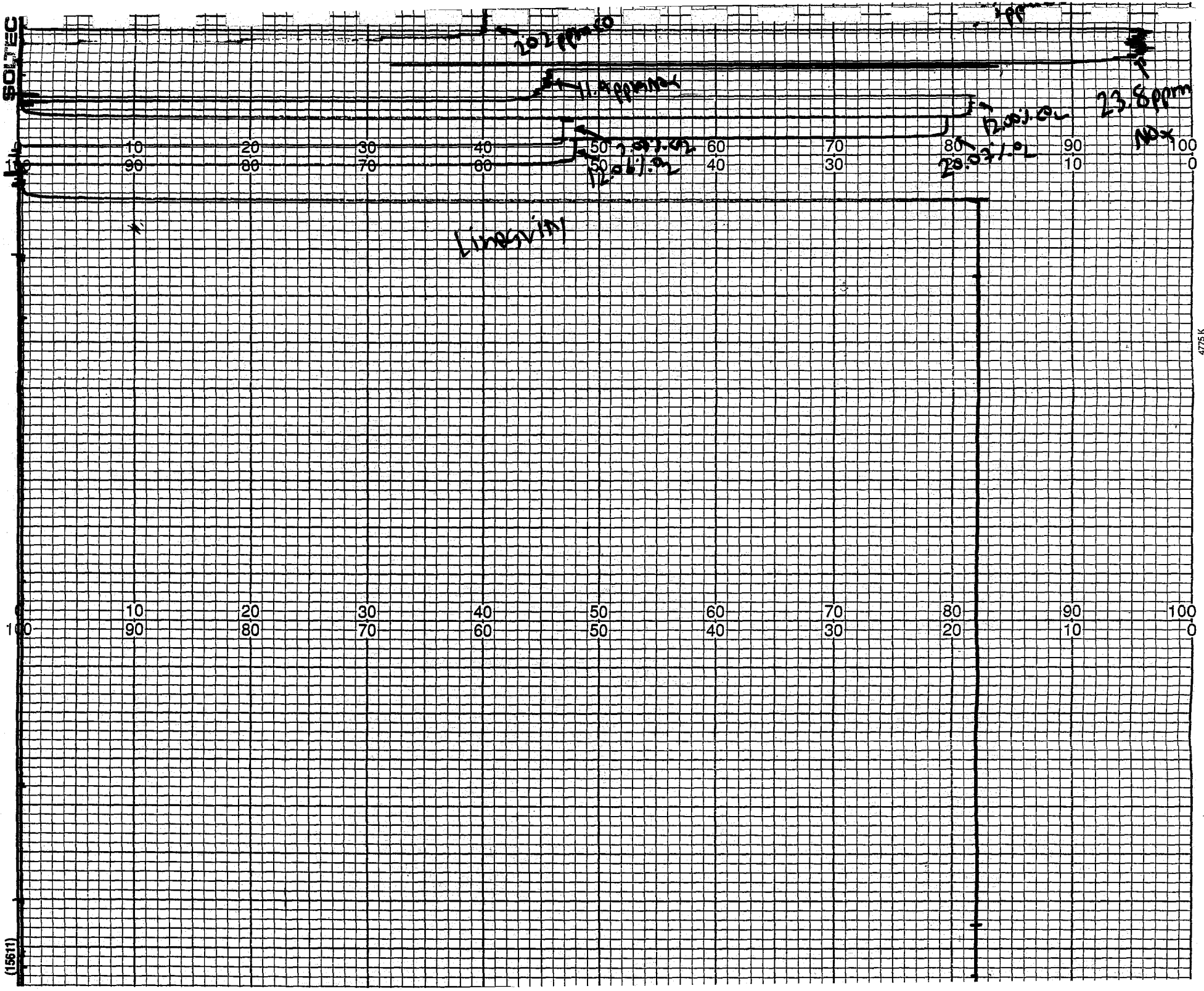

PORT CHANGE
0-15 CO
0-25 NOx
0-25 O2
0-50 CO
Flare #2 Run 2 Start 1204
Direct Cals
CO 57 55
NOx 28 26
O2 28 25
CO2 24 20
CHART NO. ZD1-01-25-20M
(15611)
SOLTEC


SOLTEC
CHART NO.
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
PORT CHANGE
PORT CHANGE
4775K


SOLTEC®
CHART NO. ZD1-01-25-20M
(15611)
0
100
10
90
20
80
30
70
40
60
50
50
60
40
70
30
80
20
90
10
100
0


SOLTEC
4775 K
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
Stopped
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0


SOLTEC
CHART NO. ZD1-01-25-20M
(15611)
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0


SOLTEC
23.8ppm
10×
Linearity
4775 K
(15611)

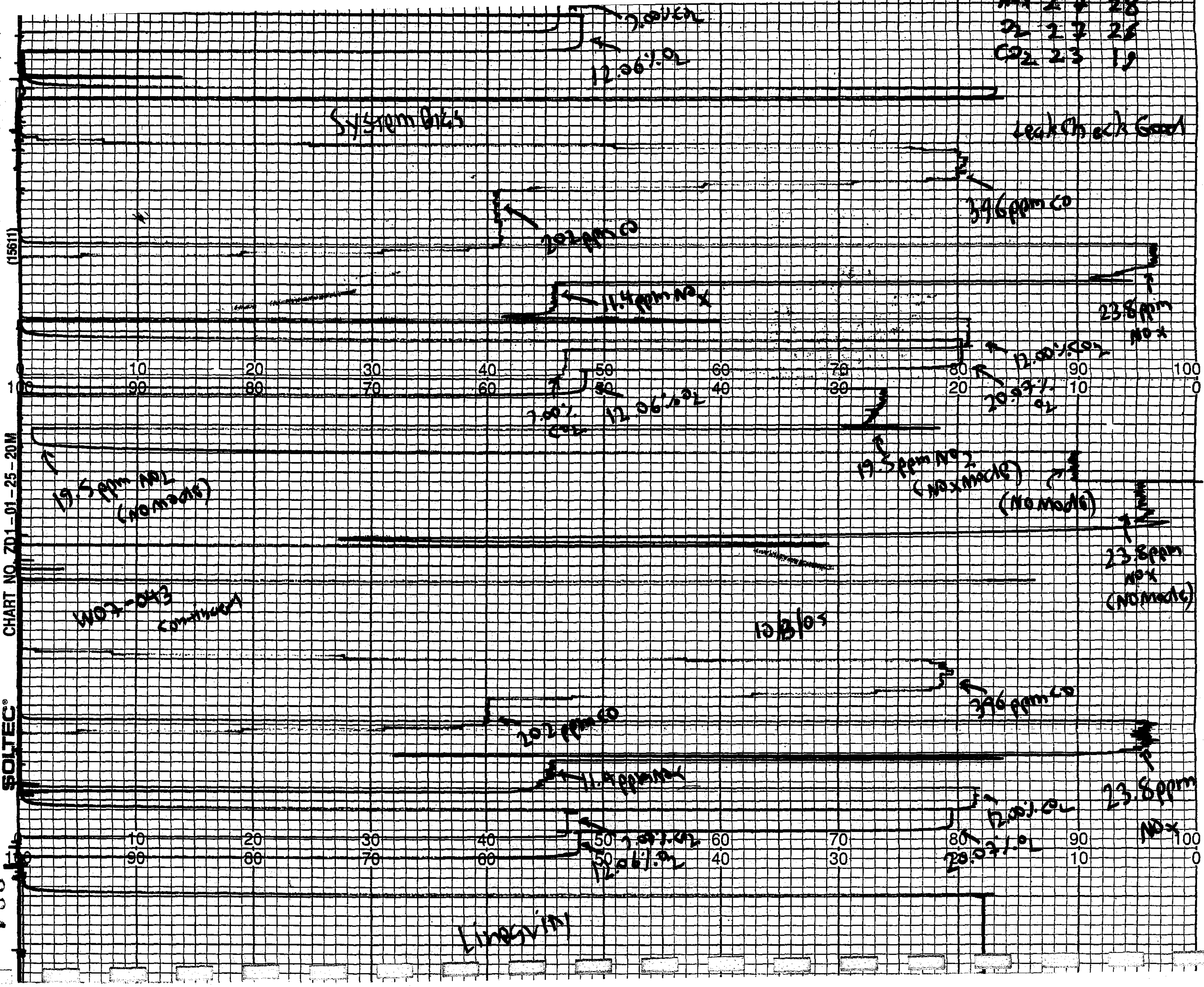


CHART NO. ZD1-01-25-20M
SOLTEC
(1561)
12.06% O2
System Bias
Leak Check Good
396 ppm CO
202 ppm CO
11.4 ppm NOx
23.8 ppm NOx
12.00% CO2
20.97% O2
7.00% CO2
19.5 ppm NO2 (NOx mode)
19.5 ppm NO2 (NO mode)
(NO mode)
23.8 ppm NOx (NO mode)
W07-043 continued
10/13/05
Linearity

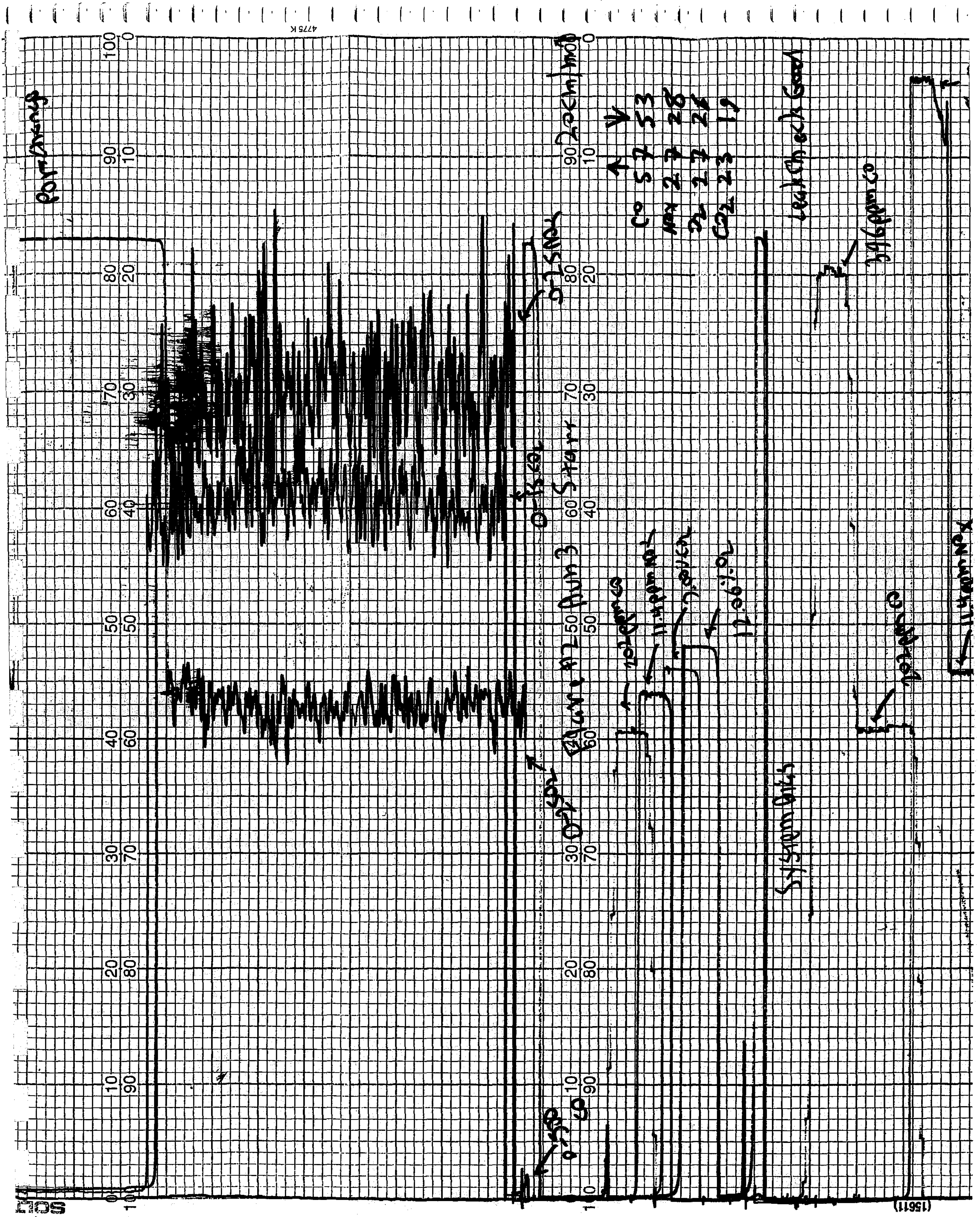
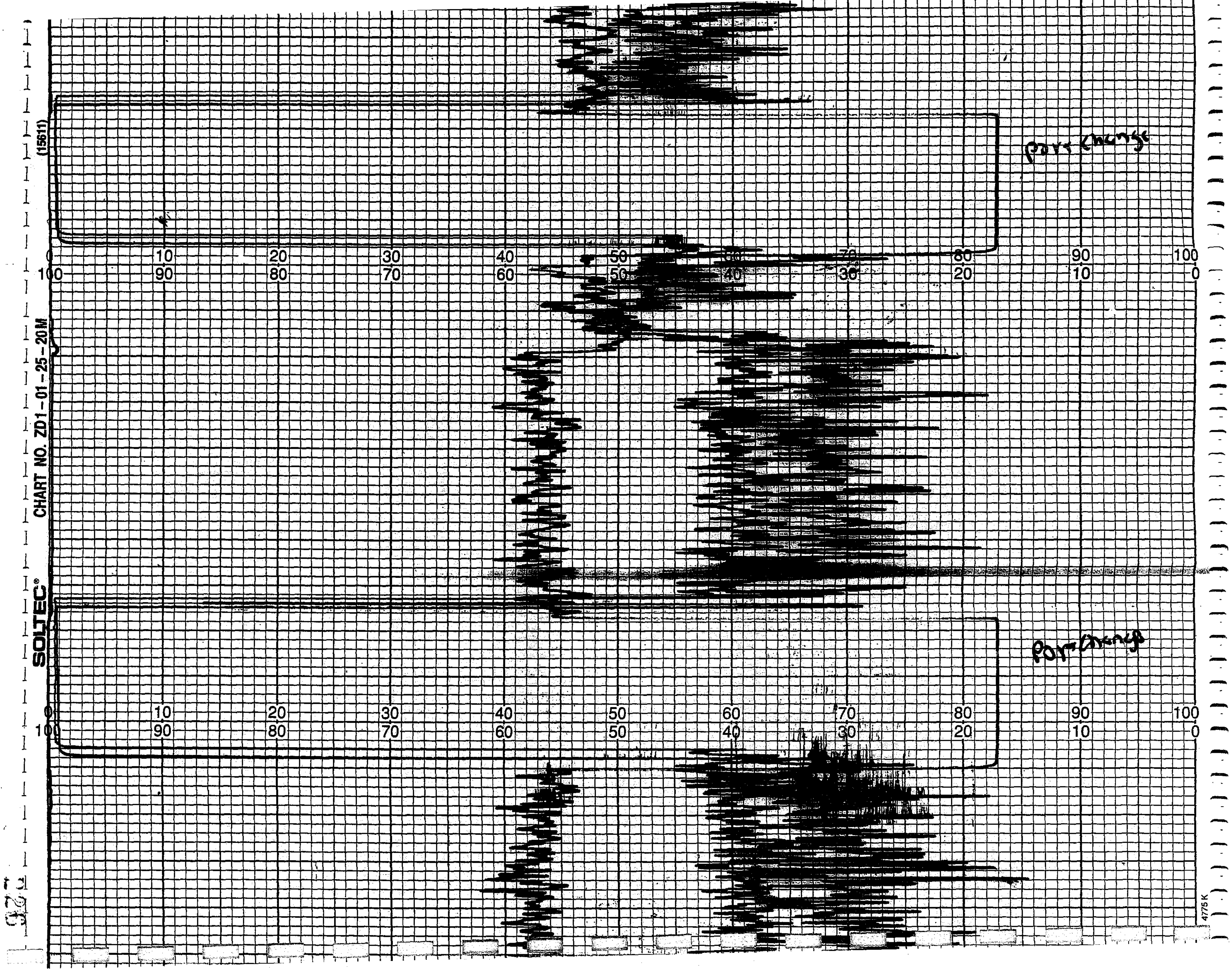
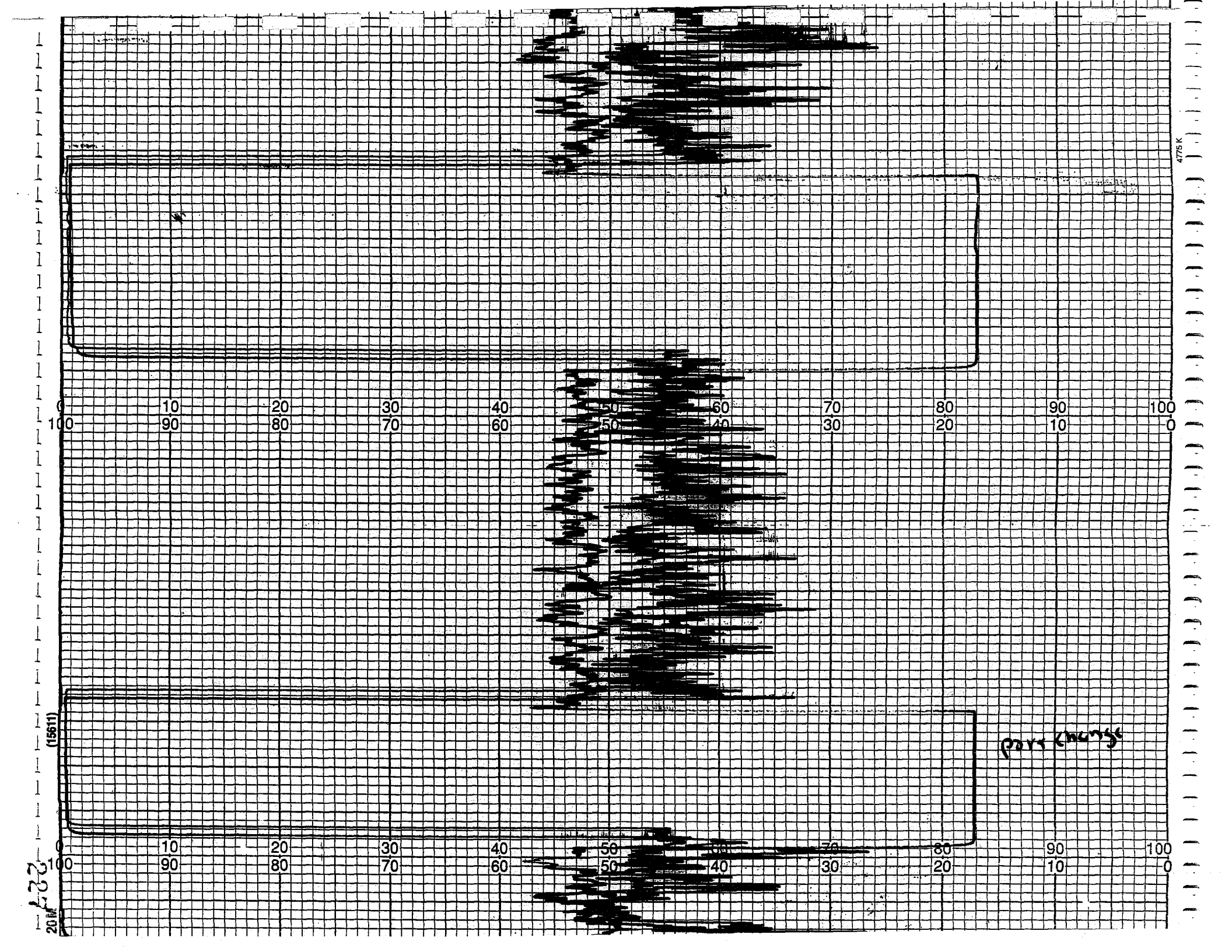
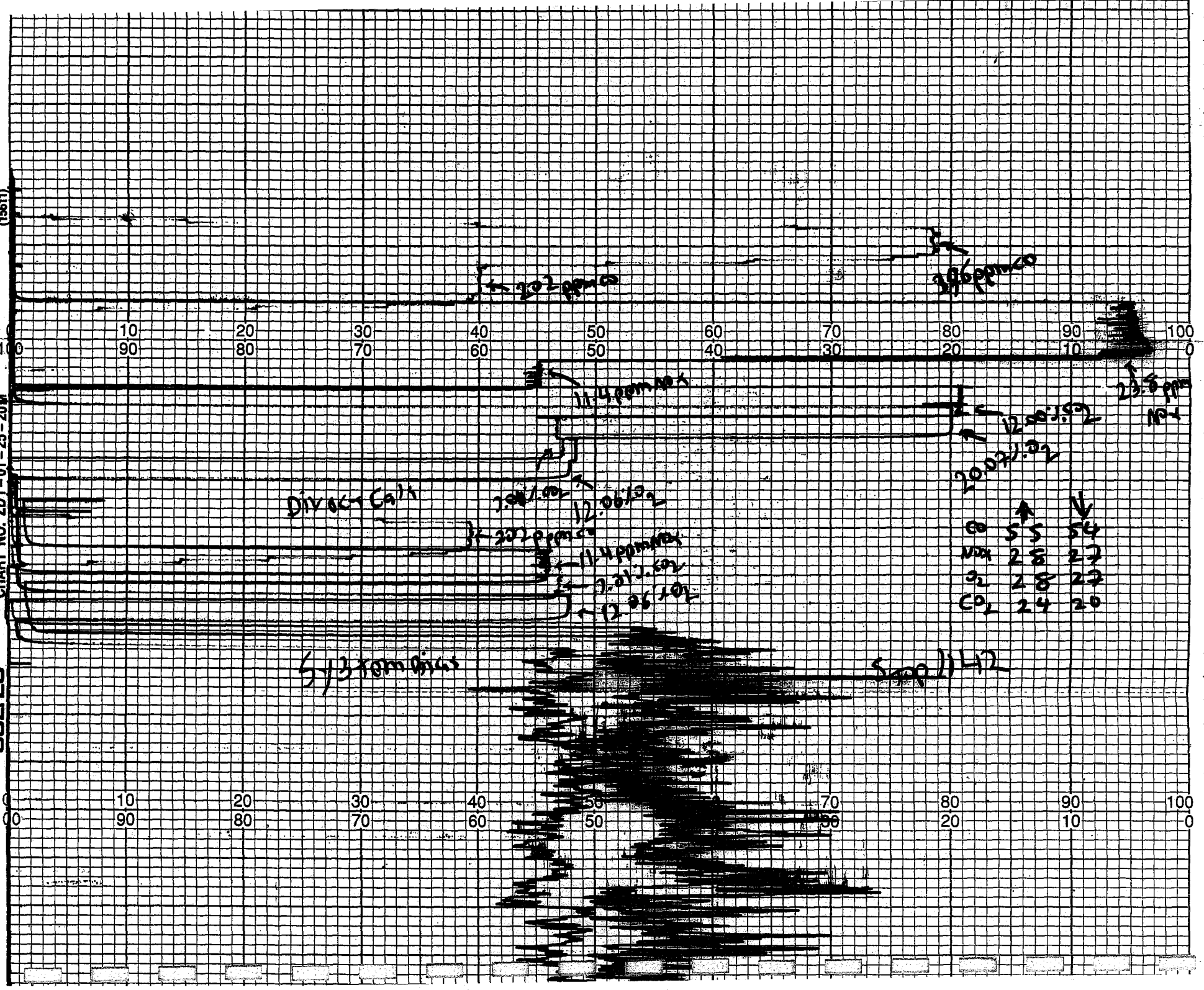


Figure #2 Run 3
Leak Check Good
System Bias
CO 57 53
NOx 27 28
O2 21 21
CO2 23 19


SOLTEC®
CHART NO. ZD1-01-25-20M
(15611)
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
port change
port change
4775 K


4775 K
(15611)
20 MA
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0


SOLTEC®
CHART NO. ZD1-01-25-20M
(15611)
0
10
20
30
40
50
60
70
80
90
100
100
90
80
70
60
50
40
30
20
10
0
CO 55 54
NOx 28 27
O2 28 27
CO2 24 20

APPENDIX E - Operating Data

OPERATING DATA
FOR LANDFILL FLARES

Facility: Simi Valley LF Date: 10/12/05

Job No.: W07-043 Run #: 1

Source: Flare #2 (John Zink)

135°F Dry 5.6 % H_2O

102°F Wet

S.P. 2200 S.P. 1625°F Top T.C.

Time	Landfill Gas Flow (SCFM)	Condensate Injection ( )	Flare Temerature (°F)	Fuel Pressure ( )	Fuel Temp (°F)
0830	2190	NA	1628	NA	NA
0845	2184		1612		
0900	2194		1634		
1030	2179		1632		
1045	2164		1613		
1100	2149		1612		
1115	2181		1625		
Avc.	2177.3		1622.3		

$2177.3 \times \frac{100 - 5.6}{100} = \underline{2055.4}$ DSCFM

OPERATING DATA
FOR LANDFILL FLARES

Facility: Simi Valley LF Date: 10/12/05

Job No.: W07-043 Run #: 2

Source: Flare #2 (John Zinc)

149 °F Dry 5.7% H_2O
103 °F Wet

S.P. 2200 S.P. 1625 °F Top T.C.

Time	Landfill Gas Flow (SCFM)	Condensate Injection ( )	Flare Temerature (°F)	Fuel Pressure ( )	Fuel Temp (°F)
1215	2207	NA	1633	NA	NA
1230	2201		1622		
1245	2180		1620		
1300	2161		1619		
1315	2179		1617		
1330	2162		1616		
1345	2163		1637		
1400	2181		1635		
Avg	2179.3		1624.9		

$2179.3 \times \frac{100 - 5.7}{100} = 2055.1$ DSCFM

OPERATING DATA
FOR LANDFILL FLARES

Facility: Simi Valley LF Date: 10/13/05

Job No.: # W07-043 Run #: 3

Source: Flare #2 (John Zink)

148 °F Dry 4.8% H_2O
100 °F Wet

S.P. 2200 S.P. 1625 °F Top T.C.

Time	Landfill Gas Flow (SCFM)	Condensate Injection ( )	Flare Temerature (°F)	Fuel Pressure ( )	Fuel Temp (°F)
0945	2170	NA	1608	NA	NA
1000	2192		1625		
1015	2187		1626		
1030	2166		1614		
1045	2164		1622		
1100	2178		1619		
1115	2172		1621		
1130	2186		1652		
AVG	2176.9		1623.4		

$2176.9 \times \frac{100 - 4.8}{100} = 2072.4$ DSCFM

OPERATING DATA
FOR LANDFILL FLARES

Facility: Simi Valley Landfill Date: 10/19/05

Job No.: W07-043 Run #: 1-930; 1-PAH; 1-HCL

Source: Flare 2 John Zink

Time	Landfill Gas Flow ( )	Condensate Injection ( )	Flare Temerature (°F)	Fuel Pressure ( )	Fuel Temp (°F)
0900	1987		1632		
0930	1974		1644		
1000	1971		1619		
1030	1961		1643		
1100	1948		1639		
1130	1941		1644		
1200	1945		1657		
1230	1998		1642		
1300	1842		1645		
1330	1719		1644		
1400	1704		1628		
1430	1700		1597		
1500	1742		1619		
1530	1745		1597		
1600	1718		1615		
1630	1665		1651		
1700					

HE1

Form #1

HE2

OPERATING DATA
FOR LANDFILL FLARES

Facility: Simi Valley Landfill Date: 10/20/05

Job No.: W07-043 Run #: 2-430/2429/2-428-/3-HC.

Source: Flare 2 Inlet

Time	Landfill Gas Flow (_____)	Condensate Injection (_____)	Flare Temerature (°F)	Fuel Pressure (_____)	Fuel Temp (°F)
0700	1705		1624		
0730	1686		1634		
0800	1643		1683		
0830	1645		1677		
0900	~~1679~~ 1702		~~1702~~ 1639		
1000	1672		1641		
1030	1654		1639		
1100	1662		1623		
1130	1642		1633		
1200	1621		1639		
1230	1630		1642		
1300	1621		1623		
1330	1633		1632		
1400	1644		1638		
1430	1652		1640		
1500	1663		1643		
1530					

Run #3

PAH 2

← Firm #2 →

Operating Data Flare 2 Simi 10/21/05

~~0700~~ time	Flow	temp
0700	2213	1636
0730	2200	1635
0800	2205	1628
0830	2213	1625
0900	1998	1623
0930	1716	1634
1000	1723	1626
1030	1730	1588
1100	1702	1639
1130	1700	1637
1200	1687	1632
1230	1640	1628
1300	1645	1648
1330	1647	1655
1400	1653	1667
1430	1660	1664
1500		
1530		
1600		
1630		

W07-043

OPERATING DATA
FOR LANDFILL FLARES

Facility: S.V.L.F. Date: 11/21/05

Job No.: C55-001 Run #: 1 M425

Source: Flare #2 Fink

Time	Landfill Gas Flow (SCFM)	Condensate Injection (_____)	Flare Temerature (°F)	Fuel Pressure (_____)	Fuel Temp (°F)
Port A 0825 00	2068		1653		
0835 10	2075		1645		
0845 20	2144		1639		
0855 30	2188		1641		
0905 40	2171		1631		
0915 50	2204		1638		
0925 60	2213		1640		
Port B ~~0930~~ 0930TW 00	2198		1647		
10	2206		1626		
20	2219		1633		
30	2210		1646		
40	2135		1617		
50	1936		1644		
60	2110		1632		

OPERATING DATA
FOR LANDFILL FLARES

Facility: SVLF Date: 11/21/05

Job No.: C56-001 Run #: 1

Source: Flare #2 Zink

Time	Landfill Gas Flow (SCFM)	Condensate Injection ( )	Flare Temerature (°F)	Fuel Pressure ( )	Fuel Temp (°F)
port C					
00	2135		1623		
10	2142		1622		
20	2161		1645		
30	2138		1629		
40	2167		1643		
50	2150		1619		
60	2140		1630		
port D					
00	2191		1655		
10	2150		1628		
20	2158		1634		
30	2144		1629		
40	2190		1640		
50	2149		1631		
60	2185		1639		

OPERATING DATA
FOR LANDFILL FLARES

Facility: SVLF Date: 11/21/05

Job No.: C56-001 Run #: 2

Source: Flare # 2 Zink

Time	Landfill Gas Flow (SCFM)	Condensate Injection ( )	Flare Temerature (°F)	Fuel Pressure ( )	Fuel Temp (°F)
Port C					
00	1989		1646		
10	1993		1631		
20	1970		1634		
30	1971		1613		
40	1988		1650		
50	1978		1642		
60	1959		1609		
Port D					
00	2017		1650		
10	1991		1645		
20	1996		1650		
30	1985		1620		
40	1990		1623		
50	2001		1639		
60	2006		1634		

OPERATING DATA
FOR LANDFILL FLARES

Facility: SVLF Date: 11/2c/05

Job No.: C58-001 Run #: R2 M25

Source: Flare 2 Zink

Time	Landfill Gas Flow (SCFH)	Condensate Injection ( )	Flare Temerature (°F)	Fuel Pressure ( )	Fuel Temp (°F)
Bet A 00	2016		1631		
10	2037		1629		
20	1981		1615		
30	1992		1653		
40	1977		1638		
50	2215		1629		
60	2235		1650		
Bet B 00	2220		1656		
10	1991		1628		
20	2014		1647		
30	1989		1650		
40	2052		1630		
50	2031		1652		
60	1972		1598		

OPERATING DATA
FOR LANDFILL FLARES

Facility: SVLF Date: 11-22-05

Job No.: C56-001 Run #: 3

Source: Flare 2 Zink

Time	Landfill Gas Flow (SCFM)	Condensate Injection (_____)	Flare Temerature (°F)	Fuel Pressure (_____)	Fuel Temp (°F)
Port A 00	1925		1617		
10	1956		1651		
20	1921		1629		
30	1936		1646		
40	1912		1620		
50	1914		1650		
60	1937		1647		
Port B 00	1916		1657		
10	1916		1618		
20	1904		1629		
30	1910		1613		
40	1924		1623		
50	1881		1618		
60	1894		1626		

OPERATING DATA
FOR LANDFILL FLARES

Facility: SVLF Date: 11/22/05

Job No.: CS8-001 Run #: 3

Source: Flare 2

Time	Landfill Gas Flow (SCFM)	Condensate Injection ( )	Flare Temerature (°F)	Fuel Pressure ( )	Fuel Temp (°F)
Port C					
00	1892		1643		
10	1901		1637		
20	1911		1607		
30	1887		1646		
40	1877		1636		
50	1931		1611		
60	1918		1642		
Port D					
00	1927		1643		
10	1930		1618		
20	1911		1650		
30	1920		1639		
40	1886		1643		
50	1907		1631		
60	1875		1664		

APPENDIX F - Correspondences

Ventura County
Air Pollution
Control District

669 County Square Drive
Ventura, California 93003

tel 805/645-1400
fax 805/645-1444
www.vcapcd.org

Michael Villegas
Air Pollution Control Officer

September 19, 2005

Richard J. Vacherot, Technical Director
Horizon Air Measurement Services, Incorporated
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Subject: Source Test Protocol Approval

Dear Mr. Vacherot:

We have reviewed the source test protocol for Waste Management, Incorporated's 44 MMBTU/hr McGill Environmental System and 75 MMBTU/hr John Zinc landfill gas flares at the Simi Valley Landfill located at 2801 Madera Road, Simi Valley, CA 93065. Mercury is not included in the source test protocol in Table 3-2, but the exclusive test method for mercury is included in the protocol. From a telephone conversation between Horizon Air Measurement Services and the District,we understand that the source test will include testing for mercury. Therefore we find that the protocol is acceptable. You are authorized to conduct the source test on October 10, 2005. Please contact us 2 working days prior to this date to confirm the test date, so that we can arrange to observe the tests.

Thank you for your cooperation in this matter. If you have any questions, please contact air quality engineer Lyle Olson at 805/645-1413.

Sincerely,

Keith Duval, Manager
Compliance Division

c. Scott Tignac, District Manager, Waste Management, Incorporated
James Riley, Environmental Engineer, Waste Management, Incorporated
Terri Thomas, Supervising Engineer, APCD

STP01395

APPENDIX G - Calibration Data

INCONEL 10-1

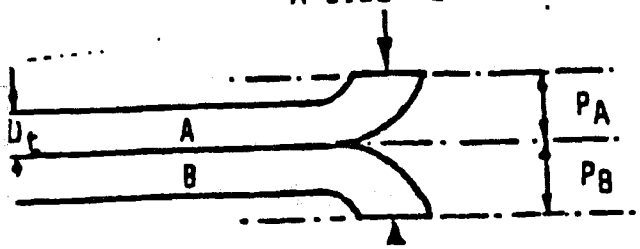
TYPE S PITOT TUBE INSPECTION DATA FORM

Tubing diameter, D_t 0.394 in.

Pitot Tube Assembly Level? (Yes) / No

Pitot Tube Openings Damaged? Yes / (No)

A-SIDE PLANE

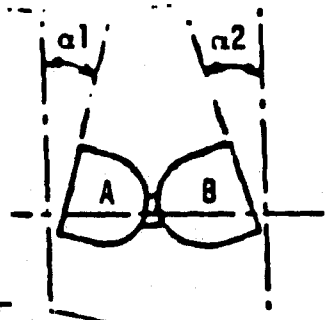


NOTE: 0.848 P_A = 0.4124 in.

$1.05\ D_t < P < 1.50\ D_t$ P_B = 0.4124 in.

$P_A = P_B$

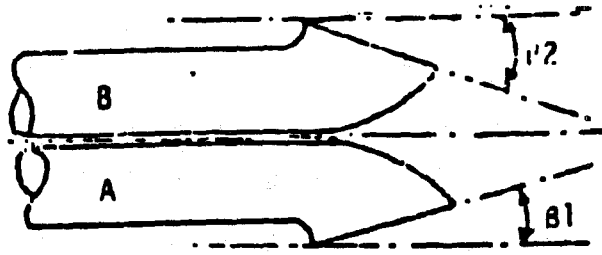
0.4137 = 0.5910



α_1 = 1.2°

α_2 = 1.0°

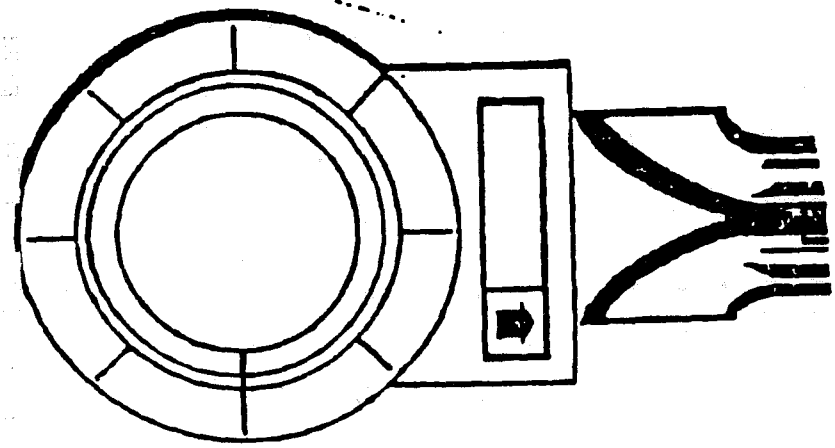
(<10°)

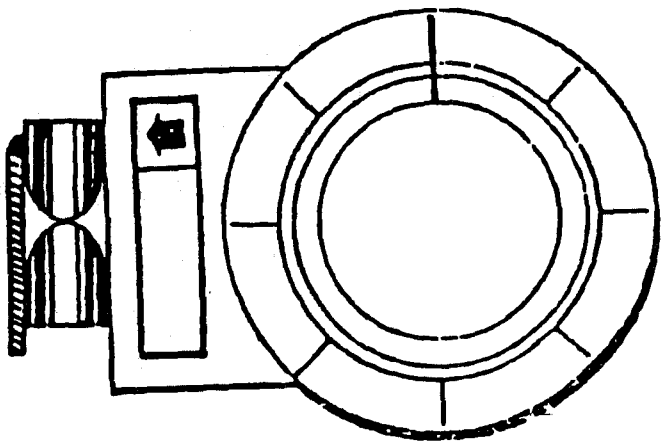


S_1 1.0

S_2 1.0

(< 5°)





Level Position to Find γ = 1.0

Z = A sin γ = 0.018 in. (< 1/8 in.)

Level Position to find θ 1.0

W = A sin θ = 0.018 in. (< 1/32 i

Comments _____

Checked by: _____ Date: 09-21-05

Calibration Required? NO

STACK TEMPERATURE SENSOR CALIBRATION DATA- APEX PROBE ASSEMBLIES

Date: 09/15/05
Calibrated by: B. Jones

THERMOCOUPLE ID:

	ICE WATER						ABSOLUTE T DIFF., %			BOILING WATER						ABSOLUTE T DIFF., %			BOILING OIL						ABSOLUTE T DIFF., %		
	REF			TC						REF			TC						REF			TC					
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Stainless Steel Probes																											
3-1	32	32	32	34	34	34	-0.4	-0.4	-0.4	212	212	212	211	212	210	0.1	0.0	0.3	549	545	535	543	542	536	0.6	0.3	-0.1
4-2	32	32	32	32	33	33	0.0	-0.2	-0.2	212	212	212	209	209	209	0.4	0.4	0.4	535	530	525	531	525	526	0.4	0.5	-0.1
4-3	32	32	32	33	33	33	-0.2	-0.2	-0.2	212	212	212	210	210	208	0.3	0.3	0.6	535	545	543	539	540	540	-0.4	0.5	0.3
6-2	32	32	32	32	34	34	0.0	-0.4	-0.4	212	212	212	209	209	209	0.4	0.4	0.4	500	510	512	499	503	505	0.1	0.7	0.7
6-3	32	32	32	36	35	35	-0.8	-0.6	-0.6	212	212	212	211	211	210	0.1	0.1	0.3	515	517	520	505	510	515	1.0	0.7	0.5
6-4	32	32	32	35	33	34	-0.6	-0.2	-0.4	212	212	212	210	209	209	0.2	0.4	0.4	520	525	543	515	515	536	0.5	1.0	0.7
A6-5	32	32	32	33	35	35	-0.2	-0.6	-0.6	212	212	212	212	210	210	0.0	0.3	0.3	545	541	542	537	536	537	0.8	0.5	0.5
A8-1	32	32	32	33	33	32	-0.2	-0.2	0.0	212	212	212	208	208	208	0.6	0.6	0.6	543	544	535	545	535	539	-0.2	0.9	-0.4
A8-2	32	32	32	35	35	35	-0.6	-0.6	-0.6	212	212	212	211	211	210	0.1	0.1	0.3	540	541	545	535	536	539	0.5	0.5	0.6
A8-3	32	32	32	33	35	35	-0.2	-0.6	-0.6	212	212	212	207	209	209	0.7	0.4	0.4	546	541	541	535	532	540	1.1	0.9	0.1
10-1	32	32	32	32	33	33	0.0	-0.2	-0.2	212	212	212	209	209	209	0.4	0.4	0.4	540	540	538	540	540	535	0.0	0.0	0.3
M17-1	32	32	32	34	34	34	-0.4	-0.4	-0.4	212	212	212	211	210	212	0.1	0.3	0.0	540	541	541	547	540	540	-0.7	0.1	0.1
M17-2	32	32	32	36	35	35	-0.8	-0.6	-0.6	212	212	212	208	209	208	0.6	0.4	0.6	542	540	541	540	539	538	0.2	0.1	0.3
M17-3	32	32	32	36	36	37	-0.8	-0.8	-1.0	212	212	212	210	210	210	0.3	0.3	0.3	545	550	551	540	550	550	0.5	0.0	0.1
Inconel																											
10-2 Inc	32	32	32	33	33	33	-0.2	-0.2	-0.2	212	212	212	211	211	209	0.1	0.1	0.4	550	550	549	538	542	545	1.2	0.8	0.4
6-1 Inc	32	32	32	36	36	36	-0.8	-0.8	-0.8	212	212	212	206	207	208	0.9	0.7	0.6	549	550	549	543	540	540	0.6	1.0	0.9
Loose Thermocouple																											
6-5	32	32	32	33	34	34	-0.2	-0.4	-0.4	212	212	212	208	208	208	0.6	0.6	0.6	549	549	550	548	551	542	0.1	-0.2	0.8
6-8	32	32	32	35	35	35	-0.6	-0.6	-0.6	212	212	212	210	210	209	0.3	0.3	0.4	550	550	549	542	545	545	0.8	0.5	0.4
7-1	32	32	32	34	36	33	-0.4	-0.8	-0.2	212	212	212	207	207	207	0.7	0.7	0.7	548	548	540	548	548	541	0.0	0.0	-0.1
8-3	32	32	32	33	34	35	-0.2	-0.4	-0.6	212	212	212	210	210	210	0.3	0.3	0.3	515	525	535	510	516	530	0.5	0.9	0.5

Note: If absolute temperature values of the reference thermometer being calibrated and the stack temperature sensors agree within 1.5 percent at each of the three calibration p
no correction is needed.

246

Nozzle Calibration Data
Continuous Quartz

Date: 09/26/05
Calibrated by: Bill Jones

QUARTZ NOZZLES

NOZZLE ID	D1 ±.001	D2 ±.001	D3 ±.001	Delta D (.004 Max)	Avg. D
CQ-1(10')	1.027	1.020	1.026		1.024
CQ-2(10')	1.054	1.054	1.054		1.0537
CQ-3(10')	1.054	1.053	1.055		1.054
CQ-4(10')	0.996	0.990	0.997		0.994
CQ-5(10')	1.009	1.011	1.010		1.010
CQ-6(10')	1.009	1.009	1.006		1.008
CQ-7(6')	1.021	1.022	1.021		1.021
CQ-8(6')	1.054	1.054	1.056		1.055
CQ-9(6')	1.053	1.052	1.052		1.052

Control Box Calibration Data

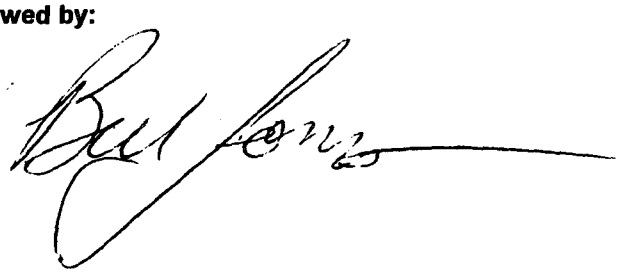
Date: 05/23/05 **Calibrated by:** Ferodie Torres

Meter Box Number: 4 **Barometric Pressure:** 28.96

Wet Test Meter Cf: 1.0022

	Gas Volumes			Temperatures			Time	Y	H@
Orifice setting (H)	Wet Test (cu.ft)	Dry Gas Initial (cu.ft)	Dry Gas Final (cu.ft)	DGM Initial (°F)	DGM final (°F)	WTM (°F)	(min)		
0.5	12.781	213.888	226.630	75	75	81	30	0.9919	1.6439
1.0	9.514	203.221	212.707	75	76	81	16	0.9920	1.6854
1.5	25.572	136.166	161.749	75	77	80	35	0.9901	1.6668
2.0	13.289	122.681	135.974	75	77	80	16	0.9890	1.7197
3.0	23.100	99.326	122.371	75	77	80	23	0.9901	1.7609
4.0	23.286	75.798	98.952	71	76	78	20	0.9890	1.7455
						AVERAGE		0.9903	1.7037

Reviewed by:



APEX INSTRUMENTS METHOD 5 PRE-TEST CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
5-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	522/MB04
Console Serial Number	40622
DGM Model Number	S110
DGM Serial Number	300230

Calibration Conditions			
Date	Time	26-Oct-05	8:00:00 AM
Barometric Pressure		29.1	in Hg
Theoretical Critical Vacuum[1]		13.7	in Hg
Calibration Technician		FT	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K_1	17.647	oR/in Hg

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

[2]The Critical Orifice Coefficient, K', must be entered in English units, $(ft^3 \cdot {}^oR^{1/2})/(in.Hg \cdot min)$.

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{amb})	(t_{amb})	
min	in H_2O	cubic feet	cubic feet	°F	°F		see above2	°F	°F	in Hg
19.0	0.2	95.987	101.708	61	61	RN-40	0.2338	69	69	24
13.0	0.5	101.708	107.561	61	62	RN-48	0.3466	69	69	23
13.0	0.9	107.561	115.000	62	63	RN-55	0.4447	70	70	22
22.0	1.7	115.000	132.450	63	68	RN-66	0.6048	70	70	21
9.0	3.0	132.450	141.721	67	71	RN-73	0.7894	70	70	18

Results

Standardized Data				Dry Gas Meter				
				Calibration Factor		Flowrate	ΔH @	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corr	0.75 SCFM	Variation
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	(Y)	(ΔY)	($Q_{m(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H2O	
5.648	0.297	5.626	0.296	0.996	0.006	0.296	1.459	-0.125
5.780	0.445	5.707	0.439	0.987	-0.003	0.439	1.560	-0.024
7.339	0.565	7.315	0.563	0.997	0.006	0.563	1.618	0.034
17.151	0.780	16.836	0.765	0.982	-0.009	0.765	1.613	0.029
9.082	1.009	8.990	0.999	0.990	0.000	0.999	1.671	0.087
				0.990	Y Average		1.584	ΔH@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature _____ Date 10·26·05

Control Box Calibration Data

Date: 06/07/05 **Calibrated by:** Bill Jones

Meter Box Number: 7 **Barometric Pressure:** 28.92

Wet Test Meter Cf: 1.0022

	Gas Volumes			Temperatures			Time	Y	H@
Orifice setting (H)	Wet Test (cu.ft)	Dry Gas Initial (cu.ft)	Dry Gas Final (cu.ft)	DGM Initial (°F)	DGM final (°F)	WTM (°F)	(min)		
0.5	11.778	25.755	37.810	83	86	78	27	0.9897	1.5243
1.0	12.149	13.054	25.509	85	87	78	20	0.9887	1.5693
1.5	30.035	981.856	1012.571	79	88	77	40	0.9877	1.5412
2.0	12.855	968.457	981.544	77	83	76	15	0.9863	1.5818
3.0	12.618	955.055	967.852	73	81	76	12	0.9825	1.5827
4.0	13.306	941.325	954.752	70	75	75	11	0.9786	1.6036
						AVERAGE		0.9856	1.5672

Reviewed by:

APEX INSTRUMENTS METHOD 5 PRE-TEST CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
5-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	522/MB07
Console Serial Number	608193
DGM Model Number	S110
DGM Serial Number	1039620

Calibration Conditions			
Date	Time	25-Oct-05	15:00 PM
Barometric Pressure		29.1	in Hg
Theoretical Critical Vacuum[1]		13.7	in Hg
Calibration Technician		FT	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K_1	17.647	oR/in Hg

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

[2]The Critical Orifice Coefficient, K', must be entered in English units, $(ft^3 \cdot {}^oR^{1/2})/(in.Hg \cdot min)$.

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{amb})	(t_{amb})	
min	in H_2O	cubic feet	cubic feet	°F	°F		see above2	°F	°F	in Hg
17.0	0.3	447.263	452.434	72	72	RN-40	0.2338	72	72	24
13.0	0.6	466.140	472.039	74	74	RN-48	0.3466	74	74	22
15.0	1.1	457.422	466.140	72	72	RN-55	0.4447	72	72	21
10.0	1.9	472.039	479.949	73	77	RN-66	0.6048	74	74	19
6.0	3.3	479.949	486.140	75	80	RN-73	0.7894	74	74	16

Results

Standardized Data				Dry Gas Meter				
				Calibration Factor		Flowrate	ΔH @	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corr	0.75 SCFM	Variation
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	(Y)	(ΔY)	($Q_{m(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H2O	
5.000	0.294	5.020	0.295	1.004	0.005	0.295	1.624	-0.135
5.693	0.438	5.680	0.437	0.998	-0.002	0.437	1.739	-0.020
8.446	0.563	8.424	0.562	0.997	-0.002	0.562	1.820	0.061
7.640	0.764	7.624	0.762	0.998	-0.001	0.762	1.786	0.027
5.973	0.996	5.971	0.995	1.000	0.000	0.995	1.825	0.066
				0.999	Y Average		1.759	ΔH@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature _____ Date _____

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

2/10/05

Horizon Air
996 Lawrence Dr Ste 108
Newbury Park, CA
USA 91320

Attention: Deborah Vacherst

Praxair Order No. **06570800**
Customer Reference No. **8A065**
Intended End User: **HORIZON AIR MEASUREMENTS**

Product Lot/Batch No. **109401605**
Praxair Part No. **EV NINX19MP-AS**

CERTIFICATE OF ANALYSIS

Primary Standard

Component	Requested Concentration	Certified Concentration	Analytical Principle	Analytical Accuracy
Nitrogen dioxide (AS NOX)	**19 ppm**	**19.5 ppm**	**U**	**±1 %**
Nitrogen	**balance**	**balance**		

Analytical Instruments: **Thermo Environmental~42H~42H~Chemiluminescence**
Cylinder Style: **ALS**
Cylinder Pressure @70F: **1700 psig**
Cylinder Volume: **122 ft3**
Valve Outlet Connection: **660**
Cylinder No(s). **CC 137428**
Comments: **VALUES NOT VALID BELOW 150 PSIG, NO=0.4 ppm (REFERENCE ONLY)**

Filling Method: **Gravimetric**
Date of Fill: **1/10/04**
Expiration Date: **2/10/07**

Analyst: **Joseph Charles**

QA Reviewer: **Phil Kim**

The gas calibration cylinder standard prepared by Praxair Distribution is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Praxair Reference Materials which are either prepared by weights traceable to the National Institute of Standards and Technology (NIST) or by using NIST Standard Reference Materials where available.

Note: All expressions for concentration (e.g., % or ppm) are for gas phase, by volume (e.g., ppmv) unless otherwise noted.

Key to Analytical Techniques:

A	Flame Ionization with Methanizer	B	Gas Chromatography with Discharge Ionization Detector	C	Gas Chromatography with Electrolytic Conductivity Detector	D	Gas Chromatography with Flame Ionization Detector
E	Gas Chromatography with Flame Photometric Detector	F	Gas Chromatography with Helium Ionization Detector	G	Gas Chromatography with Methanizer Carbonizer	H	Gas Chromatography with Photoionization Detector
I	Gas Chromatography with Reduction Gas Analyzer	J	Gas Chromatography with Thermal Conductivity Detector	K	Gas Chromatography with Ultrasonic Detector	L	Infrared - FTIR or NDIR
M	Mass Spectrometry - MS or GC/MS	N	Proprietary	O	Paramagnetic	P	Specific Water Analyzer
Q	Total Hydrocarbon Analyzer	R	Wet Chemical	S	Detector Tube	T	Odor
U	Chemiluminescence	V	Gravimetric	W	Electrolytic Cell/Electrochemical	X	Photoionization
Y	Pulsed Fluoroescence	Z	UV Spectrometry				

050

PRAXAIR

Praxair
5700 South Alameda Stre
Los Angeles, CA 90058
Telephone: (323) 585-215
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR MEASUREMENTS **P.O NUMBER**

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
NITRIC OXIDE GMIS	vsSRM#2029a	CC 144870	24.81 ppm

ANALYZER READINGS

R=REFERENCE STANDARD ***Z=ZERO GAS*** ***C=GAS CANDIDATE***

1. **COMPONENT** NITRIC OXIDE GMIS **ANALYZER MAKE-MODEL-S/N** Thermo Env. 42H S/N 42H-44979-273

ANALYTICAL PRINCIPLE CHEMILUMINESCENCE **LAST CALIBRATION DATE** 07/01/05

FIRST ANALYSIS DATE 07/14/05 **SECOND ANALYSIS DATE**

Z 0.1	R 24.7	C 11.3	CONC. 11.3		Z	R	C	CONC.	
R 24.8	Z 0.1	C 11.3	CONC. 11.3		R	Z	C	CONC.	
Z 0.0	C 11.2	R 24.8	CONC. 11.2		Z	C	R	CONC.	
U/M ppm		MEAN TEST ASSAY 11.3			U/M ppm			MEAN TEST ASSAY	

VALUES NOT VALID BELOW 150 PSIG.
NOX VALUE FOR REFERENCE USE ONLY.
LAST CONC. CERTIFIED ON 04/05/05 WAS NO=11.4ppm.

THIS CYLINDER NO. CC 181767
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. REV.9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 07/14/05
EXPIRATION DATE 07/14/07 **TERM** 24 MONTHS

CERTIFIED CONCENTRATION

NITRIC OXIDE	11.3 ppm
NITROGEN	BALANCE
NOx	11.4 ppm

ANALYZED BY JOSEPH CHARLES ***CERTIFIED BY*** PHU TIEN NGUYEN

253

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (525) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIBON AIP **P.O NUMBER**

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
NITRIC OXIDE	vs.SRM#2629	CC 144870	24.81 ppm

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** NITRIC OXIDE **ANALYZER MAKE-MODEL-S/N** Thermo Env. 42H S/N 42H-44979-272

ANALYTICAL PRINCIPLE CHEMILUMINESCENCE **LAST CALIBRATION DATE** 09,22,04

FIRST ANALYSIS DATE 07,17,04 **SECOND ANALYSIS DATE** 09,/20,/04

Z	0.0	R	23.4	C	21.2	CONC.	22.6	Z	0.0	R	24.3	C	22.4	CONC.	22.5
R	23.4	Z	0.0	C	21.7	CONC.	22.8	R	24.6	Z	0.0	C	22.7	CONC.	22.9
Z	0.0	C	21.9	R	23.8	CONC.	22.9	Z	0.0	C	22.7	R	24.6	CONC.	22.9
U/M	ppm			MEAN TEST ASSAY			22.7	U/M	ppm			MEAN TEST ASSAY			22.9

NOx values for reference only.
All values not valid below 150 psig.

THIS CYLINDER NO. CC 119008
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600, R97/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 % NIST TRACEABLE
CYLINDER PRESSURE 2000 PSIG
CERTIFICATION DATE 09 22 04
EXPIRATION DATE 09 22 06 **TERM** 24 MONTHS

CERTIFIED CONCENTRATION

NITRIC OXIDE	22.8 ppm
NITROGEN	BALANCE
NOx	22.8 ppm

ANALYZED BY PHIL KIM **CERTIFIED BY** JOSEPH CHARLES

254

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR MEASUREMENTS **P.O NUMBER**

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE GMIS	vs.SRM#2636	CC 86363	247 ppm

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** CARBON MONOXIDE GMIS **ANALYZER MAKE-MODEL-S/N** Siemens Ultramat 5E S/N A12-729

ANALYTICAL PRINCIPLE NDIR **LAST CALIBRATION DATE** 05/03/04

FIRST ANALYSIS DATE 05/05/03 **SECOND ANALYSIS DATE** 05/17/04

Z 0	R 250.0	C 202.3	CONC. 202	Z 0	R 247.0	C 202.4	CONC. 202
R 250.0	Z 0	C 202.0	CONC. 202	R 247.0	Z 0	C 202.2	CONC. 202
Z 0	C 202.2	R 250.0	CONC. 202	Z 0	C 202.2	R 247.0	CONC. 202
U/M ppm		MEAN TEST ASSAY 202		U/M ppm		MEAN TEST ASSAY 202	

Values not valid below 150 psig

THIS CYLINDER NO. CC 144968
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 05/17/04
EXPIRATION DATE 05/17/07 **TERM** 36 MONTHS

CERTIFIED CONCENTRATION

CARBON MONOXIDE	202 ppm
NITROGEN	BALANCE

ANALYZED BY VICTOR DOTAN ***CERTIFIED BY*** PHIL KIM

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PRAXAIR

Praxair
5700 South Alameda Stree
Los Angeles, CA 90058
Telephone: (323) 585-21 4
Facsimile: (714) 542-6669

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR MEASUREMENTS **P.O NUMBER** 8665

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE GMIS	vs.SRM#1680	CC 106625	498 ppm

ANALYZER READINGS

R=REFERENCE STANDARD ***Z=ZERO GAS*** ***C=GAS CANDIDATE***

1. **COMPONENT** CARBON MONOXIDE GMIS **ANALYZER MAKE-MODEL-S/N** Siemens Ultramat 5E S/N A12-729

ANALYTICAL PRINCIPLE NDIR **LAST CALIBRATION DATE** 08/01/05

FIRST ANALYSIS DATE 02/18/05 **SECOND ANALYSIS DATE** 08/17/05

Z 0	**R** 505	**C** 396	**CONC.** 396		**Z** 0	**R** 498	**C** 396	**CONC.** 396			
R 505	**Z** 0	**C** 396	**CONC.** 396		**R** 498	**Z** 0	**C** 396	**CONC.** 396			
Z 0	**C** 396	**R** 505	**CONC.** 396		**Z** 0	**C** 396	**R** 498	**CONC.** 396			
U/M ppm		**MEAN TEST ASSAY** 396			**U/M** ppm			**MEAN TEST ASSAY** 396			

VALUES NOT VALID BELOW 150 PSIG.
CO FIRST ANALYSIS DONE vs 505ppm GMIS.

THIS CYLINDER NO. CC 164230
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. REV 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 08/17/05
EXPIRATION DATE 08/17/08 **TERM** 36 MONTHS

CERTIFIED CONCENTRATION

CARBON MONOXIDE	396 ppm
NITROGEN	BALANCE

ANALYZED BY ISMAEL RANGSIYANONG ***CERTIFIED BY*** HELENA TRAN

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Praxair
5700 South Alameda Stree
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

9/30/2005

Horizon Air
996 Lawrence Dr Ste 108
Newbury Park, CA
USA 91320

Attention: Deborah Vacherst

Praxair Order No. **23379400**
Customer Reference No.

Product Lot/Batch No. **109526414**
Praxair Part No. **EV NICDOXP1-AS**

CERTIFICATE OF ANALYSIS
Primary Standard

Component	Requested Concentration	Certified Concentration	Analytical Principle	Analytical Accuracy
Carbon dioxide	**7 %**	**7.01 %**	**V**	**±0.02 % abs.**
Oxygen	**12 %**	**12.06 %**		**±0.02 % abs.**
Nitrogen	**balance**	**balance**		

Analytical Instruments: **Mettler~ID5~Gravimetric**
Cylinder Style: **AS**
Cylinder Pressure @70F: **2000 psig**
Cylinder Volume: **147 ft3**
Valve Outlet Connection: **590**
Cylinder No(s). **CC 107967**

Filling Method: **Gravimetric**
Date of Fill: **9/21/2005**
Expiration Date: **9/30/2008**

Analyst: **Jack Pu**

QA Reviewer: **Ty Triplett**

The gas calibration cylinder standard prepared by Praxair Distribution is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Praxair Reference Materials which are either prepared by weights traceable to the National Institute of Standards and Technology (NIST) or by using NIST Standard Reference Materials where available.

Note: All expressions for concentration (e.g., % or ppm) are for gas phase, by volume (e.g., ppmv) unless otherwise noted.

Key to Analytical Techniques:

A	Flame Ionization with Methanizer	B	Gas Chromatography with Discharge Ionization Detector	C	Gas Chromatography with Electrolytic Conductivity Detector	D	Gas Chromatography with Flame Ionization Detector
E	Gas Chromatography with Flame Photometric Detector	F	Gas Chromatography with Helium Ionization Detector	G	Gas Chromatography with Methanizer Carbonizer	H	Gas Chromatography with Photoionization Detector
I	Gas Chromatography with Reduction Gas Analyzer	J	Gas Chromatography with Thermal Conductivity Detector	K	Gas Chromatography with Ultrasonic Detector	L	Infrared - FTIR or NDIR
M	Mass Spectrometry - MS or GC/MS	N	Proprietary	O	Paramagnetic	P	Specific Water Analyzer
Q	Total Hydrocarbon Analyzer	R	Wet Chemical	S	Detector Tube	T	Odor
U	Chemiluminescence	V	Gravimetric	W	Electrolytic Cell/Electrochemical	X	Photoionization
Y	Pulsed Fluorescence	Z	UV Spectrometry				

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PRAXAIR

Praxair
5700 South Alameda Stre
Los Angeles, CA 90058
Telephone: (323) 585-21
Facsimile: (714) 542-668

8/31/2005

Horizon Air
996 Lawrence Dr Ste 108
Newbury Park, CA
USA 91320

Attention: Deborah Vacherst

Praxair Order No. **98947500**
Customer Reference No.

Product Lot/Batch No. **109517318**
Praxair Part No. **NI CDOXP80-AS**

CERTIFICATE OF ANALYSIS
Primary Standard

Component	Requested Concentration	Certified Concentration	Analytical Principle	Analytical Accuracy
Carbon dioxide	**12 %**	**12.00 %**	**V**	**±0.02 % abs.**
Oxygen	**20 %**	**20.07 %**		**±0.02 % abs.**
Nitrogen	**balance**	**balance**		

Analytical Instruments: **Mettler~ID5~Gravimetric**
Cylinder Style: **AS**
Cylinder Pressure @70F: **2000 psig**
Cylinder Volume: **151 ft3**
Valve Outlet Connection: **590**
Cylinder No(s). **CC 90440**

Filling Method: **Gravimetric**
Date of Fill: **6/22/2005**
Expiration Date: **12/31/2008**

Analyst: **Jack Fu**

QA Reviewer: **Ty Triplett**

The gas calibration cylinder standard prepared by Praxair Distribution is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Praxair Reference Materials which are either prepared by weights traceable to the National Institute of Standards and Technology (NIST) or by using NIST Standard Reference Materials where available.

Note: All expressions for concentration (e.g., % or ppm) are for gas phase, by volume (e.g. ppmv) unless otherwise noted.

Key to Analytical Techniques:

A Flame Ionization with Methanizer	B Gas Chromatography with Discharge Ionization Detector	C Gas Chromatography with Electrolytic Conductivity Detector	D Gas Chromatography with Flame Ionization Detector
E Gas Chromatography with Flame Photometric Detector	F Gas Chromatography with Helium Ionization Detector	G Gas Chromatography with Methanizer Carbonizer	H Gas Chromatography with Photoionization Detector
I Gas Chromatography with Reduction Gas Analyzer	J Gas Chromatography with Thermal Conductivity Detector	K Gas Chromatography with Ultrasonic Detector	L Infrared - FTIR or NDIR
M Mass Spectrometry - MS or GC/MS	N Proprietary	O Paramagnetic	P Specific Water Analyzer
Q Total Hydrocarbon Analyzer	R Wet Chemical	S Detector Tube	T Odor
U Chemiluminescence	V Gravimetric	W Electrolytic Cell/Electrochemical	X Photoionization
Y Pulsed Fluorescence	Z UV Spectrometry		

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APPENDIX H - Raw Laboratory Data